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CULTURAL LANDSCAPE OVERVIEW

PETROGLYPH NATIONAL MONUMENT

New Mexico

September 1994

NATIONAL PARK SERVICE

U.S. DEPARTMENT OF THE INTERIOR

TECHNICAL INFORMATION CENTER
DENVER SERVICE CENTER
NATIONAL PARK SERVICE

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New Mexico

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Prepared by

Peggy S. Froeschauer
Office of the Associate Regional Director,
Planning and Professional Services
Southwest Regional Office
P.O. Box 728
Santa Fe, New Mexico 87501-0728
505-988-6886

With contributions by Anne Goldberg

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It should be noted that much of the information found in this study was previously identified by other researchers working with the resources at Petroglyph National Monument--particularly Eric Brunnemann, Matt Schmader and Art Ireland. The author is grateful to these fellow researchers for making this information available.

Thanks for support of this project are also extended to Steve Whitesell, Superintendent, Petroglyph National Monument; and Joel Kussman, Chief of Planning for the Central Team, Denver Service Center.

ABSTRACT

This Cultural Landscape Overview for Petroglyph National Monument was prepared after a literature search was conducted; and after some initial archival research and reconnaissance-level field investigations were conducted that allowed for the identification of the landscape's character-defining features, as well as preliminary statements of resource significance.

It should be noted that this is not an exhaustive study of the cultural landscape resources within Petroglyph National Monument. Additional research and analysis are needed before specific landscape treatment alternatives are developed. The ethnographic landscape resources within the park have yet to be comprehensively identified. Time limitations during the landscape overview prevented researchers from conducting oral interviews, because the primary focus was on assessing available archival data and conducting field reconnaissance. Information regarding the contemporary ethnographic associations and concerns with regard to the landscape was obtained from the park's 1993 Rapid Ethnographic Assessment. The completion of a comprehensive ethnographic and ethno-historic study should be a high priority for future project funding, because the information it will provide will help guide planning, development, and management decisions.

The work presented in this overview represents the equivalent of a Phase II Cultural Landscape Inventory, with some general management recommendations for use in the park's General Management Plan. Because the analysis of the park's cultural landscape resources is based on preliminary research findings, the recommended approach for management is preservation. Following more exhaustive and comprehensive research and analysis of these resources, more specific treatment recommendations and management alternatives may be developed.

A Cultural Landscape Report for Petroglyph National Monument should incorporate an interdisciplinary approach to thoroughly research and analyze all components and types of cultural landscape resources. The Cultural Landscape Report should include additional archival and field investigations, as well as oral histories, ethno-histories, and ethnographic studies of the contemporary groups who have been traditionally associated with the land in and adjacent to the park boundaries. Because of the need for conducting numerous interviews with the Hispanic and American Indian groups associated with the West Mesa area, a qualified ethnographer will be an essential part of the Cultural Landscape Report process.

BACKGROUND

INTRODUCTION

The study for this Cultural Landscape Overview for Petroglyph National Monument (hereafter referred to as "the park") was conducted during an 8-week period from late December through mid-February 1994. The work was coordinated through the Office of Planning and Professional Services, Southwest Region, National Park Service, with assistance from park staff and members of the General Management Plan team at the Denver Service Center.

The intent of the project was to document past land uses, and identify the character-defining elements that comprise the landscape within Petroglyph National Monument. The information gathered during this project will be incorporated into the General Management Plan that is currently being prepared for the park lands, and will also be incorporated into preliminary design guidelines for contemporary program needs.

Work for the study consisted of conducting a literature and archival search to document the cultural landscape; field documentation to identify the landscape's character-defining features; and a preliminary analysis and evaluation of the park's cultural landscape resources, with regard to their significance and integrity. It should be noted that this study was not intended to represent an exhaustive research project. In the future, a more comprehensive Cultural Landscape Report study should be conducted, which follows a multi-disciplinary approach, and which will comprehensively identify all landscape resources, including ethnographic landscapes and traditional cultural properties.

The following report presents the research findings generated by the Cultural Landscape Overview study; and details the analysis and assessment of these findings, along with recommendations and guidelines for incorporation into the General Management Plan.

ADMINISTRATIVE DATA

Efforts to protect the volcanoes and escarpment along Albuquerque's West Mesa started in 1961 with the city's acquisition of 1,500 acres for La Boca Negra Park, and 3,800 acres that comprise Shooting Range State Park and a Grasslands Preserve. In 1969, the City/County Goals Program called for the preservation of the volcanoes and escarpment as open space, and provided guidance for

public acquisition. The history of the Open space Program spans four decades. In 1961, the City of Albuquerque acquired over 4,000 acres on the West Mesa from the Bureau of Land Management, as part of the Recreation and Public Purposed Act. Included in this acquisition were the West Mesa lands for the Shooting Range State Park, Grasslands Preserve, and La Boca Negra Park. Interest in protecting Albuquerque's open space was first publicly recognized in the City/County goals Program of 1969. Throughout the 1970s, a desire to protect the open-space lands on Albuquerque's west mesa grew as citizens became interested in acquiring specific open-space lands. Three years later, the city began to acquire lands for the creation of Volcano and Indian Petroglyph State Parks. Even prior to the 1975 and 1988 Albuquerque/Bernalillo County comprehensive Plan's "Plan for Open Space," or establishment of Petroglyph National Monument, acquisitions of the Northwest Mesa's lava flows were proposed. The City acquired the 70-acre Indian Petroglyph State Park in 1972, prompted by a local park dedication ordinance. Matching state and federal funds were later used for park development. In 1973, Albuquerque's City Commission approved acquisition of 1,883 acres on top of the mesa, including the three southern volcanos, using matching federal funds from the Land and Water Conservation Fund (LWCF). Shortly thereafter, in 1976, the two northern volcanos containing 440 acres were acquired, using the same federal matching source of funds; these lands became known as Volcano Park. A third matching grant from the federal government in 1978 matched City funds to acquire 2,120 acres from the owners of the Bond Ranch between the volcanos and La Boca Negra Park.

Major open-space acquisitions below the volcanic escarpment did not occur until the City of Albuquerque began purchasing land in the Piedras Marcadas Canyon in 1983. The "Northwest Mesa Escarpment Plan," adopted by the city Council in 1987 and the County Commission in 1988, recognized the importance of the escarpment, adjacent open space, and the Zuris-Mann site (Piedras Marcadas pueblo ruin), purchased in 1988 by the City of Albuquerque.

During the 1980s, additional lands were purchased; numerous plans and special studies were prepared; and preservation zoning codes were established to actively support the preservation of the significant resources, and to ensure the continued existence of open-space lands in the West Mesa area of Albuquerque.

The special studies also resulted in the creation of Las Imagines National Archeological District, which was determined to be a nationally significant cultural resource area and was placed on the National Register of Historic Places in 1985.

In 1990, Congress passed Public Law 101-313, which established the 7,255-acre Petroglyph National Monument, and mandated that the National Park Service, the City of Albuquerque, and the State of New Mexico "... preserve for the benefit and enjoyment of present and future generations, that area in New Mexico containing the nationally significant West Mesa Escarpment, the Las Imagines National Archeological District, a portion of the Atrisco Land Grant, and other significant natural and cultural resources"

The enacting legislation goes on to authorize the Secretary of the Interior to "enter into cooperative agreements with either the state or the city under which the Secretary may manage and interpret any lands owned by the State of the city respectively, within the boundaries of the monument¹."

The management goals of the park are currently being defined through the General Management Plan process, and the findings of this study will supplement that plan. The General Management Plan will determine the overall approach for protecting the park's resources, visitor use and facility programs, appropriate public uses, and agency roles. An Interpretive Prospectus is also under way for the park, and may also utilize the findings of this Cultural Landscape Overview study. The Interpretive Prospectus will focus on the park's significance through its archeological, natural, and landscape resources, and its contemporary ethnographic values--all of which contribute to visitors' understanding and appreciation of the place.

PROJECT AREA

This project included the 7,255 acres within the boundaries of Petroglyph National Monument. The park's land base is comprised of four parcels that are non-contiguous and under the ownership of multiple land management agencies: the Piedras Marcadas Pueblo ruins (also known as the Zuris-Mann Site); the Northern Geologic Window;² the Southern Geologic Window; and the Piedras Marcadas, Boca Negra, and Atrisco parcels (figure 1). The park is divided into three units:

Atrisco Unit	5,279.25 acres
Piedras Marcadas Unit	1,760.81 acres
Boca Negra Unit	<u>215.44 acres</u>
Total	7,255.50 acres

Along the park's eastern edge, a rapid expansion of residential and commercial development is filling the open grasslands that lie along the base of the escarpment and continue down toward the Rio Grande. The southern edge of the park is currently bounded by grazing land within the historical lands of the Atrisco Land Grant, and is administered by the Westland Development Corporation.

¹ Public Law 101-313, June 27, 1990, Section 105.

² NOTE: There are two "geologic windows" that are included within the boundaries of the Petroglyph National Monument. A third "window" is not included within the park boundaries. These include naturally occurring erosional remnants created as lava flows surrounded by knolls or hillocks of sedimentary rock, which subsequently eroded away, leaving "holes" or "windows" that reveal the stratigraphy of the various lava flows.

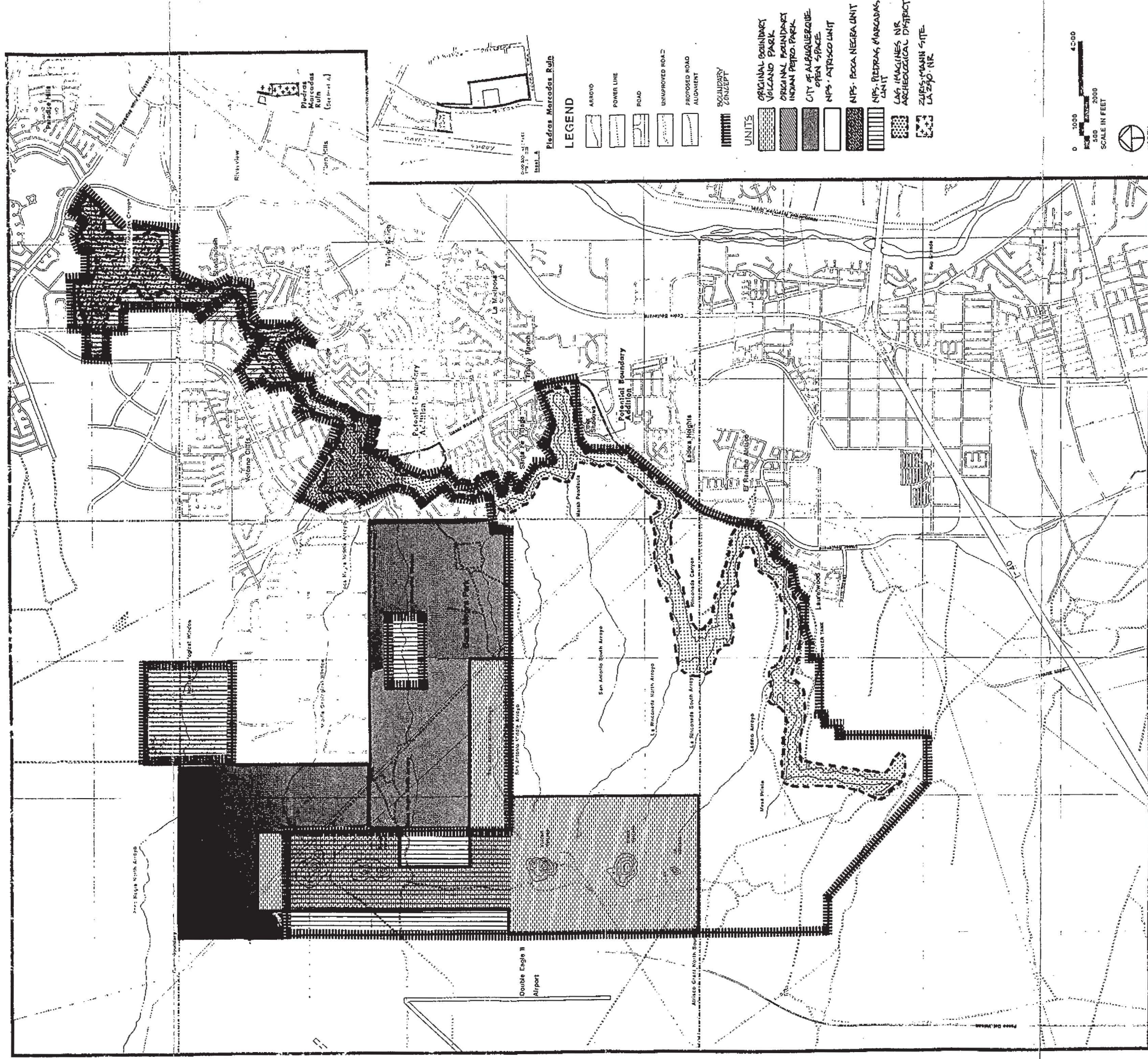
Future private developments will probably be proposed for this land. Future development of these lands will be addressed in a Sector Planning Process that is currently under way. Unser Boulevard follows along the eastern edge of the escarpment. Changes are proposed for the Unser alignment, and they may be carried out at some time in the future.

The city-owned and city-managed Indian Petroglyph Park is included within the park boundaries, and is included within the Boca Negra management unit as established by the legislation. This park area includes previously developed visitor facilities. Boca Negra Canyon defines this area, and an existing road leading up through the canyon provides access to the mesa top from the eastern edge of the escarpment. Immediately northeast of this road alignment is the high-density undeveloped, residential Volcano Cliffs subdivision, which extends from the escarpment across the currently undeveloped mesa top and covers roughly 140 acres.

The northeastern area of the park is defined by Piedras Marcadas Canyon. The City of Albuquerque proposes the extension of Paseo del Norte south of this area; the lower reaches of the canyon area are surrounded by residential developments.

The western edge of the park land is comprised of adjoining mesa lands that extend to the east and south toward Mesa Prieta. The Double Eagle II Airport access road--Paseo del Vulcan--runs north-south from Interstate 40, and is situated just beyond the western boundary of the park. The State of New Mexico Highway Department is currently directing a corridor study for the alignment of Paseo del Vulcan, which is proposed to run from Interstate 40, and loop into New Mexico 44 or Interstate 25 in the vicinity of Bernalillo. The land immediately adjacent to the western boundary is presently undeveloped grasslands used for ranching operations--primarily cattle grazing. The Double Eagle II Airport is also located immediately west of the park, and is proposed for future expansion. Much of the land surrounding the airport may be subject to future commercial and light industrial development. The City of Albuquerque Aviation Department is developing a new master plan for the Double Eagle II Airport, which will address potential use for commercial and industrial development, as well as expanded general aviation arteries. The City of Albuquerque is also developing a Westside Strategic Plan, which will address growth in the vicinity of Double Eagle Airport and other mesa-top lands.

The northern geologic window area included within the Piedras Marcadas management unit is surrounded by undeveloped grasslands along the broad and open mesa top. The lands that are adjacent to this non-contiguous parcel of Petroglyph National Monument are included within the Alameda Grant to the north, privately owned lands to the south and east, and open-space lands to the west.



The southern geologic window area, also included within the Piedras Marcadas management unit, is surrounded by the undeveloped grasslands that characterize the mesa top. The lands that surround this non-contiguous parcel of the park are included within the City of Albuquerque's open-space lands. The City of Albuquerque is currently developing an Open Space Facility Plan to address uses on open-space lands.

PROBLEMS / ISSUES

This Cultural Landscape Overview study focused on the following issues identified by the park and the General Management Plan team, in consultation with the State of New Mexico, the City of Albuquerque, and the park's advisory commission.

Future data needs for the park are being identified by the Resource Management Plan and the General Management Plan. Data needs specifically related to cultural landscape resources will be identified in the recommendations section of this Cultural Landscape Overview.

Threats identified by the General Management Plan and this study include: accelerated urban encroachment in the West Mesa area; vandalism of the land and the resources, in the form of shooting and chiseling away rock faces bearing petroglyphs, spray painting rock faces, erosion and accelerated arroyo cutting resulting from overgrazing and sheet wash, and illegal dumping of trash and general refuse dumping; subsurface ownership of mineral rights on many of the parcels included within the park boundaries; and demands for additional rights-of-way for increased utility, storm water control, and transportation needs.

With the continued development of the newly established Petroglyph National Monument, visitor use is projected to increase, and a subsequent increase in visitor facilities will be required. The General Management Plan team is developing recommendations and generalized design guidelines that will specifically address any new visitor facilities proposed for development within or adjacent to the park lands.

The close proximity of Petroglyph National Monument to a major urban area such as Albuquerque increases the scope and range of public-use demands. Some of the requested uses include equestrian trails; bicycle trails; hiking trails ranging from primitive backcountry to hard-surfaced walks that are accessible for all visitors; scenic drives; areas that afford the opportunity for solitude; and passive use areas for viewing the resources (nature and petroglyphs).

The Interpretive Prospectus team is currently working to establish the park's goals and objectives for resource interpretation. Hopefully, this study will provide some additional site and

resource information that can be utilized by the interpretive planners in the development of their prospectus.

The issues of resource management and protection are being discussed in the Resource Management Plan, the General Management Plan, the Interpretive Prospectus, and this Cultural Landscape Overview study. Although it is understood that recreational use and visitor needs will be provided for, all proposed uses and developments should avoid impacting the park's significant resources.

Through an integration of the various studies that are currently under way, park planners should address the above-described problems and issues, and ensure the continued preservation of the natural and cultural resources that are the focus of visitors and the reason for the establishment of Petroglyph National Monument.

METHODOLOGY

The research conducted for this project was not exhaustive, due to the limited time available and the need to incorporate the findings of the study in with the work of the General Management Plan team. The scope of the project focused on the park's prehistoric and historic landscape resources. Although the contemporary ethnographic landscape retains value and significance to Pueblo Indian and Hispanic cultures, appropriate research has not yet been conducted to allow for the identification and analysis of landscape features and areas with regard to the ethnographic landscape. Information from the park's Rapid Ethnographic Assessment Study, completed in 1993, was used to delineate areas identified as being sensitive to change. In the future, a Cultural Landscape Report with an ethnographic research component that will address the contemporary ethnographic landscape should be conducted.

Three distinct approaches were used during the data-collection phase: a background study/literature search; archival research; and field research. The background study/literature search consisted of locating and reviewing existing National Park Service documents and research reports for Petroglyph National Monument, and special studies and research reports focusing on the West Mesa area, Albuquerque, and the middle Rio Grande Valley. These documents included archeological survey and excavation reports, soil and geologic surveys, and sampling projects; and general county and area histories, with special emphasis on settlement patterns and land-use practices. Of primary use was the survey data gathered by the National Archeological Sites Inventory team. This National Park Service effort consists of a multi-year inventory survey of park lands, and it is starting its third year at Petroglyph National Monument. An attached bibliography includes all reference and comparative sources located and examined during the Cultural Landscape Overview study. Numerous individuals known to have a working knowledge of the study area and its surrounding

region were consulted, and assisted the researchers by providing additional documentation and/or direction. A list of individuals consulted with during this study is included as appendix 1.

Archival facilities in Santa Fe and Albuquerque, New Mexico, were utilized, and although some site-specific information was located, the majority of references were quite general in nature. A listing of repositories visited and collections/materials examined is included below.

Santa Fe, New Mexico:

Laboratory of Anthropology--archeological site forms.

National Park Service, Southwest Regional Office--Regional library, files from divisions including planning, history, anthropology, land resources, remote-sensing.

State Archives and Records--History Files, Subject Index, Governor McDonald Papers, Photograph Collections; Albert Schroeder Collection, Works Progress Administration files.

Albuquerque, New Mexico:

Bernalillo County Map Room, Room 6046, 1 Civic Plaza, Albuquerque, New Mexico (county-wide aerials).

City of Albuquerque Museum--Photo Archives.

Kirtland Air Force Base, Environmental Management Division.

National Park Service--Petroglyph National Monument library, administrative files, National Archeological Sites Inventory, Cooperative Studies Unit.

University of New Mexico--Zimmerman Library, Southwest Research Center (SWRC), Mapping and Geographic Information Center (MAGIC), Earth Data Analysis Center (EDAC).

U.S. Army Corps of Engineers, Albuquerque District, Geotechnical Branch--Range and target files, West Mesa/Volcanoes Area.

Field research was limited during this overview study. The primary focus of field investigations was on identifying the landscape's character-defining components and features. In order to maximize effort and make the best use of our limited field time, individuals familiar with the lands within and surrounding the park were asked to provide locational information regarding noted landscape features such as corrals, rock alignments, and bombing-target areas. Archeological site-survey data bases and site maps were examined; and sites were coded according to site type and cultural affiliation. Fortunately for this project, some of the

archeological survey teams have noted locations for various types of features in the landscape, including exploratory coring, drilling tests, and bomb clusters. Historic maps were also examined for locations of landscape features. These identified sites were then visited and photographed.

A photographic documentation of views into and away from park lands was conducted using black-and-white print and color slide film. Aerial photograph interpretation and field investigations were used to assess existing conditions and develop the site analysis map that is included in this report.

All of the data collected through archival and field research efforts has been organized in three-ring binders; and copies have been placed in the cultural landscape project files of the Office of Planning and Professional Services of the Southwest Regional Office, and in the park's resource files. Based on the findings of this Cultural Landscape Overview project, it is apparent that additional research relating to the park's landscape resources should be conducted, and should comprehensively examine ethnographic landscape resources and traditional cultural properties. Future projects related to the park's cultural landscape resources should include detailed documentation of individual landscape features, detailed ethno-historic and ethnographic studies, oral histories, continuation of archeological survey projects, and an extensive deed history for park lands. All of these studies are needed for the development of a comprehensive Cultural Landscape Report. Specific treatment and management alternatives should not be developed without this additional research.

REGIONAL CONTEXT

PHYSIOGRAPHIC

Petroglyph National Monument is located on the west side of the Rio Grande, in Albuquerque, New Mexico. It is incorporated in the Albuquerque Basin, which stretches 100 miles from Socorro to La Bajada Hill, and spans 15 miles on either side of the Rio Grande. The Albuquerque Basin is one of a series of basins that make up the larger Rio Grande Basin. The park is also included in the Rio Grande Valley section of the Chihuahuan Desert, and is 5,000 to 6,000 feet above sea level. The area only receives about 8 to 9 inches of annual precipitation; and most rain comes in brief, heavy downpours. However, the Rio Grande provides a permanent source of water, and there is a large aquifer under Albuquerque that keeps the city relatively green.

Residents of the city refer to the park as being on the "West Mesa." This area has been called by many names throughout the city's history, including "La Ceja" and "La Loma," but is defined by the visually striking, 17-mile-long volcanic escarpment and five "volcanoes" that can be seen throughout the city. Both of these features were formed in volcanic eruptions occurring about 110,000 years ago.³ These eruptions took place along two volcanic fissures--one 2 degrees east of north; and the other 3 degrees east of north. The "volcanoes" are the five largest cinder cones or vents produced at the end of the eruptions. Within a matter of months, the volcanic fissures produced six lava flows, which spread mostly to the east. The first two were fluid and far-flowing; the next two were more viscous, and traveled a little to the west; and the last two were small, producing only the vents that can be seen today. Today, the volcanic basalt covers 23 square miles, and some people contend that the flows may have covered twice that area before being affected by erosion.⁴ The escarpment is the eastern edge of the lava flows. All of the soil on top of the volcanic material has been deposited by wind.

The lava flows formed the topography of the West Mesa and some of the park's most significant landmarks. The peninsulas on the escarpment (Rinconada, Mesa Prieta, Marsh) were formed as lava traveled down existing arroyos. Over time, the softer sedimentary rock around the arroyos eroded away, exchanging what had been low ground for high ground. Also, when the lava flowed around hills,

³ There is another theory that the volcanoes erupted 190,000 years ago, but the most current data suggests that the date given above is more accurate, based on the geomagnetic information. See Geissman, 1990.

⁴ Kelley, 1982. Geissman disagrees with this (personal communication, 1994).

rather than over them, similar erosion occurred, leaving what are referred to as geological windows. These "holes" in the lava show the stratigraphy of each successive lava flow, thereby providing valuable geologic information.

The evidence of the volcanic activity that took place in the area that is now the park is important as more than simply a collection of landmarks. When molten rock cools, it records the magnetic field of the earth at that moment. The volcanic rock in the park shows a unusual geomagnetic reading, which may coincide with a magnetic excursion that has been documented around the world, but only in sedimentary rock. Igneous rock, like that found in the park, is a much better geomagnetic meter than sedimentary rock, so this discovery is indeed significant. Also, the volcanic vents contain a mixture of spatter, cinder, and lava; and the five major cones are in a straight line (caused by the fissure), which is unusual.

The West Mesa has been broken by Matthew Schmader⁵ into several physiographic zones, moving west to east. The western edge of the mesa is marked by a volcanic escarpment just east of the Rio Puerco. The mesa stretches unbroken until it reaches the volcanoes, which make up their own physiographic zone. Then, the mesa resumes, sloping down to the east to the volcanic escarpment that overlooks the floodplain of the Rio Grande. The volcanic escarpment comprises another zone, and marks the edge of the mesa. However, it is useful to include the Rio Grande floodplain in any discussion of the West Mesa, because circulation patterns between the two are so established. The park boundaries include the physiographic zones as far west as the volcanoes and all of the physiographic zones to the east that have been mentioned. Seven major arroyos cut through the West Mesa, each of them flowing to the east. They are, from north to south: Calabacillas, Piedras Marcadas, Boca Negra, San Antonio, Rinconada, Ladera, and Mirehaven. The soil, vegetation, and wildlife of the park vary in each zone, as will be discussed. The types of archeological sites found in each region vary accordingly.

CULTURAL

The Middle Rio Grande Valley has been occupied and utilized by human populations for about 12,000 years. Archeological surveys have identified several Paleo-Indian sites scattered throughout the valley, along with numerous other prehistoric period sites ranging from Archaic through the Pueblo I-V periods.

Spanish exploration of the Rio Grande Valley occurred around 1540, with Francisco Vazquez de Coronado's expedition. During their journey northward along the Rio Grande, Coronado's chroniclers

⁵ Schmader 1987.

mentioned passing through or by several inhabited pueblos and numerous abandoned villages.

It should be noted that Coronado brought the first sheep into New Mexico during his 1539 expedition.⁶ Although most of the flock was used for food, it appears that some strays may have been taken in by the Pueblo Indians.

As early as 1570, a few Spanish settlers were unofficially moving into the Rio Grande Valley and beginning to farm its rich flood-plain soils. In 1582, the expedition of Antonio de Espejo followed the Camino Real de Tierra Adentro (also known as the Chihuahua Trail) and made note of a few sheep in some of the New Mexico pueblos. However, it was not until 1598 that sheep were brought in for the purpose of establishing breeding herds and officially introducing the sheep industry to New Mexico. In addition to herds of cattle, horses, and goats, approximately 3,000 sheep were included on the roster of supplies and equipment accompanying the first official colonization party led by Governor Juan de Oñate.⁷ Oñate's party included colonists, soldiers, and a group of Franciscan friars, along with more than 80 cumbersome two-wheeled carettas. Again, the Camino Real was the chosen transportation route, because it provided relatively direct access from Santa Barbara, Mexico, northward to Santa Fe, New Mexico.

The first Spanish settlements were established in the immediate vicinity of many of the pueblos, so within a few years there were problems stemming from competition for available resources such as water rights, arable lands, and timber resources. These early settlements were later followed by official colonies that moved just beyond the Middle Rio Grande area. According to Simmons,⁸ no settlers took up residence on or near the future site of Albuquerque during the early years of the Spanish realm in New Mexico. By the early 17th century, several missionaries were assigned to work with the various Pueblo groups in the Middle Rio Grande Valley. Soon, conflicts began to arise as a result of the missionaries' actions to "civilize" and convert the Pueblo Indians in order to meet the missionaries' ideal image, as prescribed by Hispanic Catholicism. The continued efforts of the missionaries to eliminate the native religions, combined with other oppressive actions, resulted in the Pueblo Revolt of 1680 and the subsequent departure of a majority of the Spanish occupants.

By the mid 1690s, many Spanish colonists were returning to the Rio Grande region, and were soon working for the development of more cooperative relationships with the Pueblo peoples. Territorial and cultural boundaries were re-defined by both groups.

⁶ Jenkins, Dr. Myra Ellen. Letter to Robert Radnitz dated October, 19, 1965.

⁷ Ibid.

⁸ Simmons, Marc. Albuquerque: A Narrative History.

The town of Albuquerque was established in 1706 by a group of Spanish families who were granted land by King Felipe V of Spain. The town was soon an important stopping place for those traveling the Old Chihuahua Trail. When Mexico gained its independence from Spain in 1821, the frontier was unofficially open to external commercial development originating from the adjacent American territory. By the middle of the 19th century, New Mexico had become part of the new American frontier, and the City of Albuquerque was serving as an important military outpost for the U.S.

By the spring of 1880, the Atchison, Topeka, and Santa Fe Railway (AT&SF) was laying the final tracks in the depot grounds of the City of Albuquerque, opening the city for further developments as part of mainstream America. A new pattern of development was soon introduced to the area as the gridded street patterns quickly replaced the earlier meandering paths and alleyways. The coming of the railroad led to the city's rising prominence, and facilitated the development of the area's wool and mining trades. The cattle industry also benefited substantially as a result of the introduction of railway transportation.

Also during this period of growth for the city, new schools, colleges, and universities were being established. The University of New Mexico was founded in 1889.

As the city was transformed and overlain by new patterns of land use and development, the West Mesa area sat silently to the northwest, and remained virtually untouched. It was not until the first deep-water wells were dug on the mesa top that private ranches and associated developments were established in and around the West Mesa area. Some of the area's early ranches include the T-Bar Ranch, Volcano Ranch, Black Ranch, and High's Ranch. The majority of these ranches were established during the early and mid-20th century.

For more detailed information regarding the development history of Albuquerque and the Rio Grande region of New Mexico, please refer to Simmons,⁸ Westphall,⁹ Tainter and Levine,¹⁰ and Weigle.¹¹

⁸ Simmons, Marc. Albuquerque: A Narrative History.

⁹ Westphall, Victor. Mercedes Reales: Hispanic Land Grants of the Upper Rio Grande Region. UNM Press. 1983.

¹⁰ Tainter, Joseph A., and Frances Levine. Cultural Resources Overview: Central New Mexico. 1987.

¹¹ Weigle, Marta. Brothers of Light, Brothers of Blood. The Penitentes of the Southwest. UNM Press. 1976.

CULTURAL PERIODS

PREHISTORIC

(12,000 B.C.-A.D. 1540)

The West Mesa landscape, with its escarpment and volcanoes, has been utilized and modified by various tribes, clans, and groups of American Indian peoples for thousands of years. Archeological survey projects have recorded Paleo-Indian artifacts within the Petroglyph National Monument boundaries.

Other recorded sites represent probable Archaic period lithic scatters, campsites, and food-processing areas; and also Basketmaker and Pueblo I-V period sites that include field houses, camp sites, agricultural terraces, rock alignments, material procurement and processing sites, and soil and water control structures. The site of a pueblo ruin is included within one of the park's non-contiguous parcels, and is referred to as Piedras Marcadas Pueblo (or the Zuris-Mann Site, LA-290). The Piedras Marcadas Pueblo was inhabited during the Pueblo IV period (A.D. 1325 to 1650). An earlier Pueblo III component has also been identified in association with this site. The pueblo was one of the largest settlements located within the Middle Rio Grande Valley during the Pueblo and proto-historic periods. The site has been estimated to cover approximately 11.5 acres, and was included on the National Register of Historic Places in 1985 as part of the Piedras Marcadas Archeological District.

HISTORIC

(A.D. 1540-1944)

In 1540, Coronado recorded that he passed through or by more than a dozen occupied Tiwa pueblos as he made his way northward along the Rio Grande between Isleta and Bernalillo. The names and locations of the pueblos identified by Coronado's chroniclers are not consistent with either contemporary or historic Pueblo names, thereby making the association between actual Pueblo ruins and historic references a difficult and often-debated task for historians and other researchers. At present, it is believed that Piedras Marcadas Pueblo was occupied during the early Spanish exploration period.

Very little site-specific information has been located to provide a documented assessment of land-use activities during the 16th through the 19th centuries for the lands that now comprise Petroglyph National Monument. It appears that a large portion of

the area remained as unclaimed open space until the early 19th century, while other portions of the acreage were included in two early Spanish land grants. The Atrisco Grant was established sometime prior to the Pueblo Revolt of 1680; it was later re-established in 1692, and, all totaled, included approximately 82,000 acres. The Alameda Grant, to the north, was established in 1710, when Don Diego de Vargas granted 89,346 acres of land to Francisco Montes Vigil.

Inadequate archival information has been located and examined to address the development of the Alameda Grant. Approximately 113 acres of the 89,346-acre grant are included within the park boundaries. Several significant character-defining landscape features are located on this tract, such as sheep corrals, extensive petroglyph panels, and wall alignments.

More information was readily available for the Atrisco Land Grant. Approximately 1,946 acres of this grant are now included within the park boundaries. Metzgar notes that the Atrisco settlers, or Atrisqueños, established three functional areas within their grant, including the village nucleus, with individually owned grant lands in the valley; the Ranchos de Atrisco, which were the more fertile bottom lands; and the common lands of the West Mesa.¹²

Thus, although the West Mesa portion of the Atrisco Grant was not used for settlement per se, it was used for sheep grazing by the various families included in the ownership of the grant, and shepherd camps were scattered throughout the landscape (figure 2). The shepherds took advantage of natural landforms such as the escarpment and the volcanoes, because these landforms readily provided protection from wind for them and their sheep. Holding pens and corrals of various sizes were constructed for containing sheep over night. Some areas within the West Mesa contain multiple pens, while others consist of a single corral. All are dry-stacked lava boulders ranging from two to five or six courses. It is possible that some of these stacked stone corrals may have been supplemented with cut and entwined brush (rabbit brush, juniper, etc.). Other features associated with sheep herding in the area probably included corrals constructed of only interwoven brush (chiceros); bedding ground (majada) areas; and salt troughs¹³ scattered near the bedding ground. The ephemeral nature of these features easily explains their absence in the landscape seen today.

In the cursory review of records and documents relating to the Atrisco Land Grant, quail hunting and sheep grazing were the only traditional uses by the Atrisqueños that have been identified for the West Mesa area. A comprehensive ethnohistory will undoubtedly

¹² Metzgar, Joseph V. The Atrisco Land Grant, 1592-1977, in "New Mexico Historical Review," 52(4):269-296.

¹³ Note: Salt was apparently brought in from the natural deposits occurring in the Estancia Valley to the east of the Sandia and Manzano Mountains.

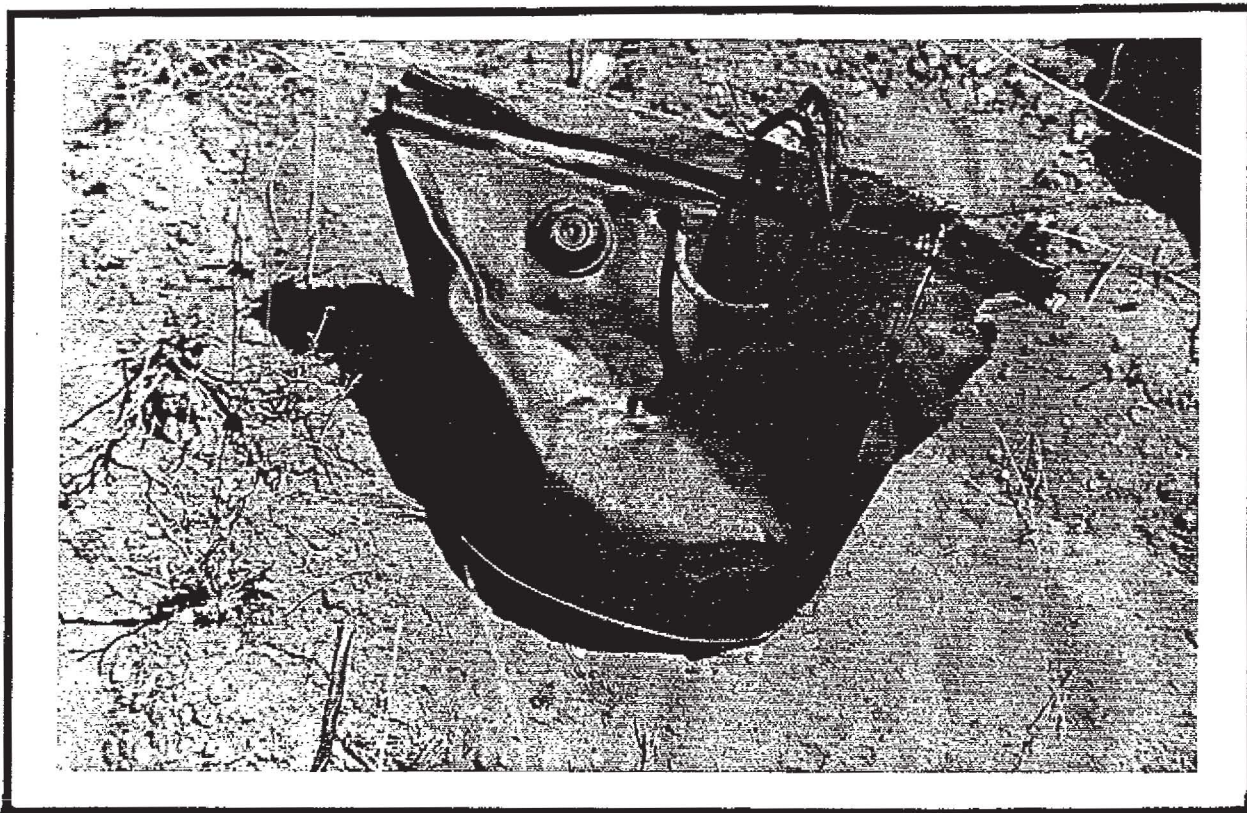


FIGURE 2. Photograph of sheep rattle found during
archeological survey of monument lands. Homemade
rattle is a crimped lard can with rocks inside.

shed more light on land-use activities, as well as on traditional values and significance.

Although the growth and development of Albuquerque increased during the 19th century, it did not expand into the West Mesa area. Historic map collections from various local repositories were examined, but they provided little or no information. More often than not, the escarpment was included on these historic maps but seemed to serve merely as a graphic border for the northwestern edge of the growing City of Albuquerque (figure 3). Maps showing the route taken during the Navajo people's Long Walk from Bosque Redondo back to their homeland reveal that "The People" passed through the Albuquerque area during July 1868 (figure 4). A few petroglyphs along the escarpment have been said to closely resemble Navajo petroglyphs.¹⁴ It seems possible that the escarpment and volcano area was visited during this time.

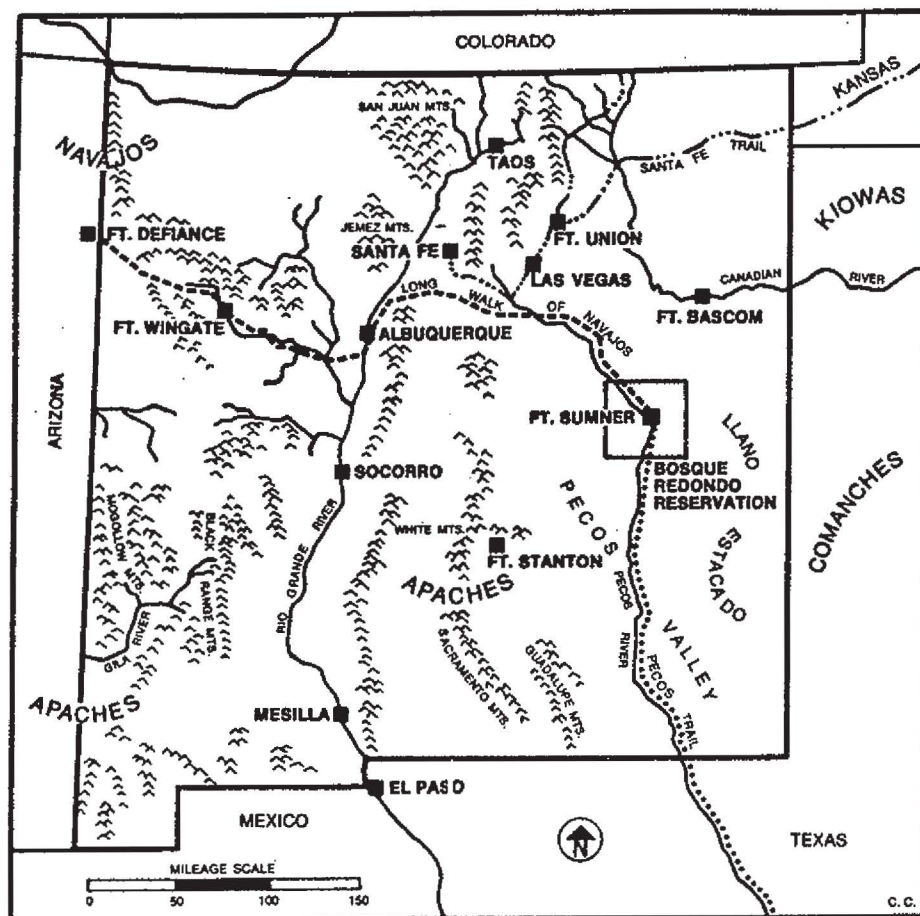
In 1917, the Santa Fe Railway was given "checkerboard" grants for the land around the volcanoes and across the mesa top. This land was subsequently leased to area ranchers for livestock grazing. It was not until the early- to mid-20th century that several large private ranches were developed around the North Valley and West Mesa. The railroad grant lands were purchased by Frank Bond and Co., Inc., in 1951, and the non-contiguous parcels were consolidated through land exchanges with the Bureau of Land Management.¹⁵ Portions of the Bond family's former Volcano Ranch incorporated into the park's land holdings. The remnants of an aqueduct, metal stock tank, and vertical post corral for cattle were located immediately east-southeast of Bond Volcano (figure 5). The aqueduct brought water from the Volcano Ranch well to the stock tank. The well is located at Volcano Ranch, immediately west of park lands. These features were probably developed in the 1950s, because Volcano Ranch was being established around that time.¹⁶ A 1954 United States Geological Survey (USGS) topographic map includes the tank and the aqueduct, along with some unimproved jeep trails. The ongoing archeological survey of park lands (NASI--that is, National Archeological Survey Initiative) has recorded some water pipes in the vicinity of Mesa Prieta, which are probably associated with the Volcano Ranch operations.

In 1919, the National Guard developed a shooting or target range in the area south of Rinconada Canyon. This development is shown on a 1957 general highway map of Bernalillo County (refer to figure 14). The date that this facility was abandoned has not been

¹⁴ Ailema Benally. Personal communication. February 1994.

¹⁵ Open Space Task Force West Mesa Committee. Master Plan for Volcano Park. August 1980. P. E-2.

¹⁶ Rodgers, James B. The Volcano Ranch Historic Site of the Llano de Albuquerque, New Mexico. 1981 (unpublished manuscript).



New Mexico Territory in the 1860s

FIGURE 4.

Map showing the "Long Walk of the Navajos", taken from Thompson, 1976.

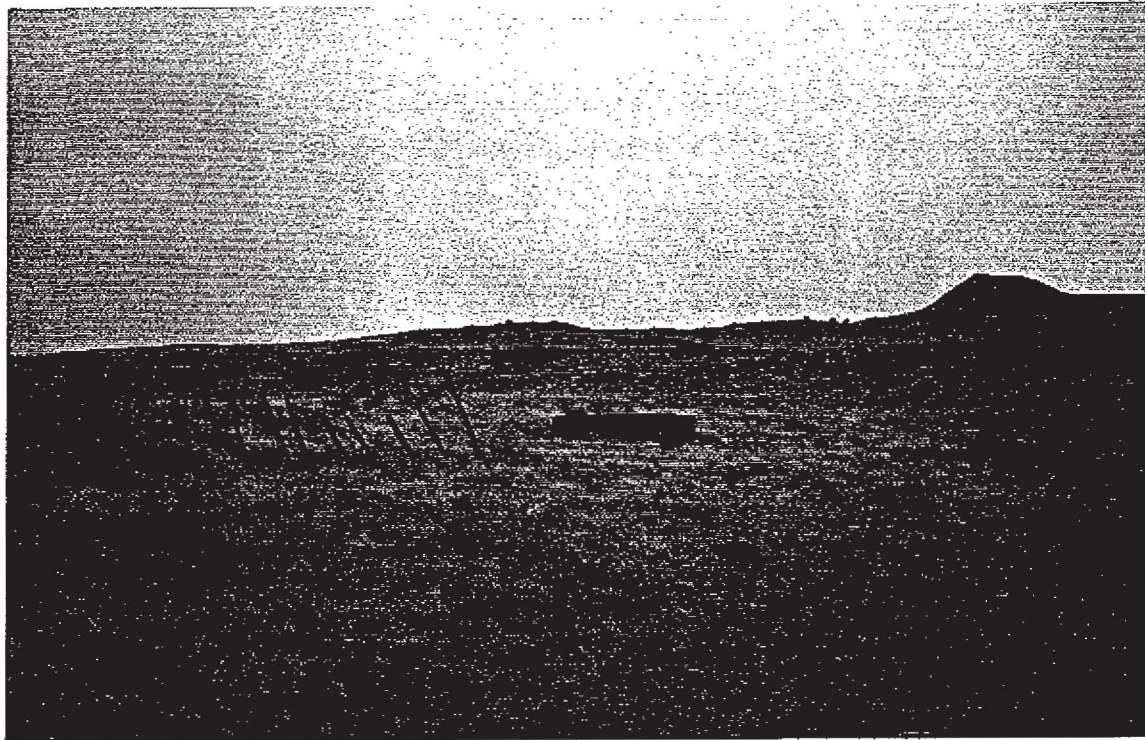


FIGURE 5.

Photograph of mid twentieth century corral and stock tank associated with Volcano Ranch and located just southeast of Bond Volcano.

established. It was removed by the National Park Service in 1992.¹⁷

Beginning sometime during the 1920s and continuing until the last few years, land within the Atrisco Grant in the vicinity of the volcanic cones was leased for mining operations. One lease was established in 1926 with Cegelsky, Avery, and Preston of Albuquerque for the mining of volcanic ash. A large quarry for cinder gravel was excavated southeast of Vulcan, and a smaller excavation was mined from the small cone to the south. According to Kelley, the material was used in the manufacture of cemented cinder blocks.¹⁸ It has been said that scree from the volcanoes area was sold to the railroad for use on railroad beds.¹⁹ Also during this time, exploration for oil and gas deposits was conducted in and around the West Mesa area.

In December 1941, the War Department (later known as the Department of Defense) leased lands on the West Mesa, and established a 15,246-acre Precision Bombing Range, which included targets used by cadets in the bombardier school during practice training missions. The range extended from "just east of the volcanoes to the Rio Puerco Escarpment on the west, and from the southern boundary of the Town of Alameda Grant on the north to the northern boundary of the Town of Atrisco Grant on the south"²⁰ (figure 6). The range was used for bombing practice during the period 1941-1946. The Bombardier School was established at Kirtland Air Force Base in 1942, and was one of nine such training programs developed across the country.

Approximately 27 targets were developed west and southwest of Albuquerque for use by the bombardier school.²¹ Improvements made to the target areas consisted of "bull's eye" targets bladed into the soil; fences and other patterns, including battleship outlines, bladed into the ground surface; mock oil refineries; and submarine ports. At least one of the target areas included within the Precision Bombing Range is located on Petroglyph National Monument lands: Target Area N-4, which has been identified as a bull's-eye target consisting of four concentric circles ranging in diameter from approximately 1,000 feet to 500, 400, and 200 feet (figure 7).

¹⁷ Diane Souder. Petroglyph National Monument. Personal communication. April 1994.

¹⁸ Kelley, Vincent C. Albuquerque: Its Mountains, Valley, Water, and Volcanoes. New Mexico Bureau of Mines and Mineral Resources, No. 9. 1982.

¹⁹ Diane Souder. Petroglyph National Monument. Personal communication. April 1994.

²⁰ Burroughs, Gary. Letter to Mr. Robert Gurule, Director of Public Works, City of Albuquerque, NM., dated April 16, 1992.

²¹ Alberts, Don E. Balloons to Bombers: Aviation in Albuquerque 1882-1945. 1987. P.69.

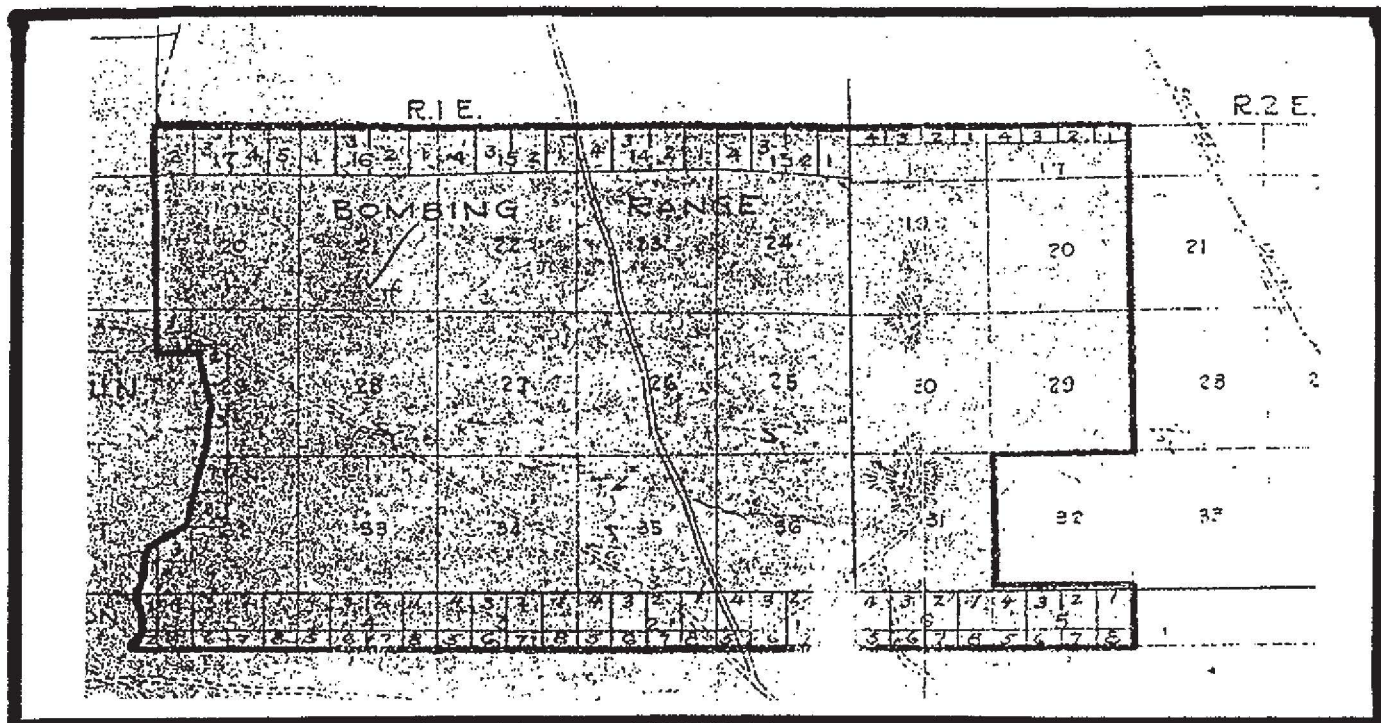
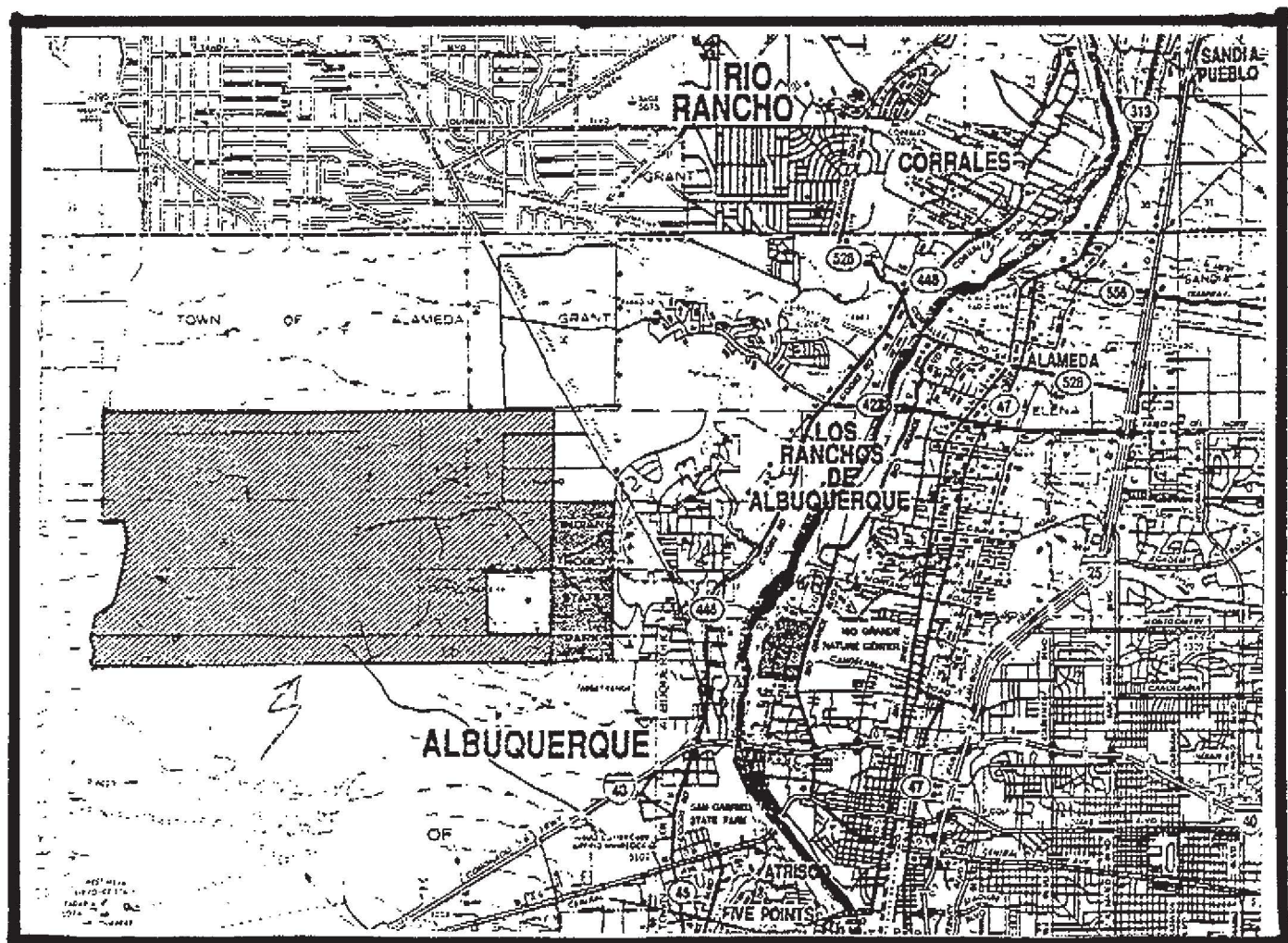


FIGURE 6. Figures A and B show Kirtland Air Force Base Precision Bombing Range; maps obtained from US Army Corps of Engineers, Albuquerque, NM.



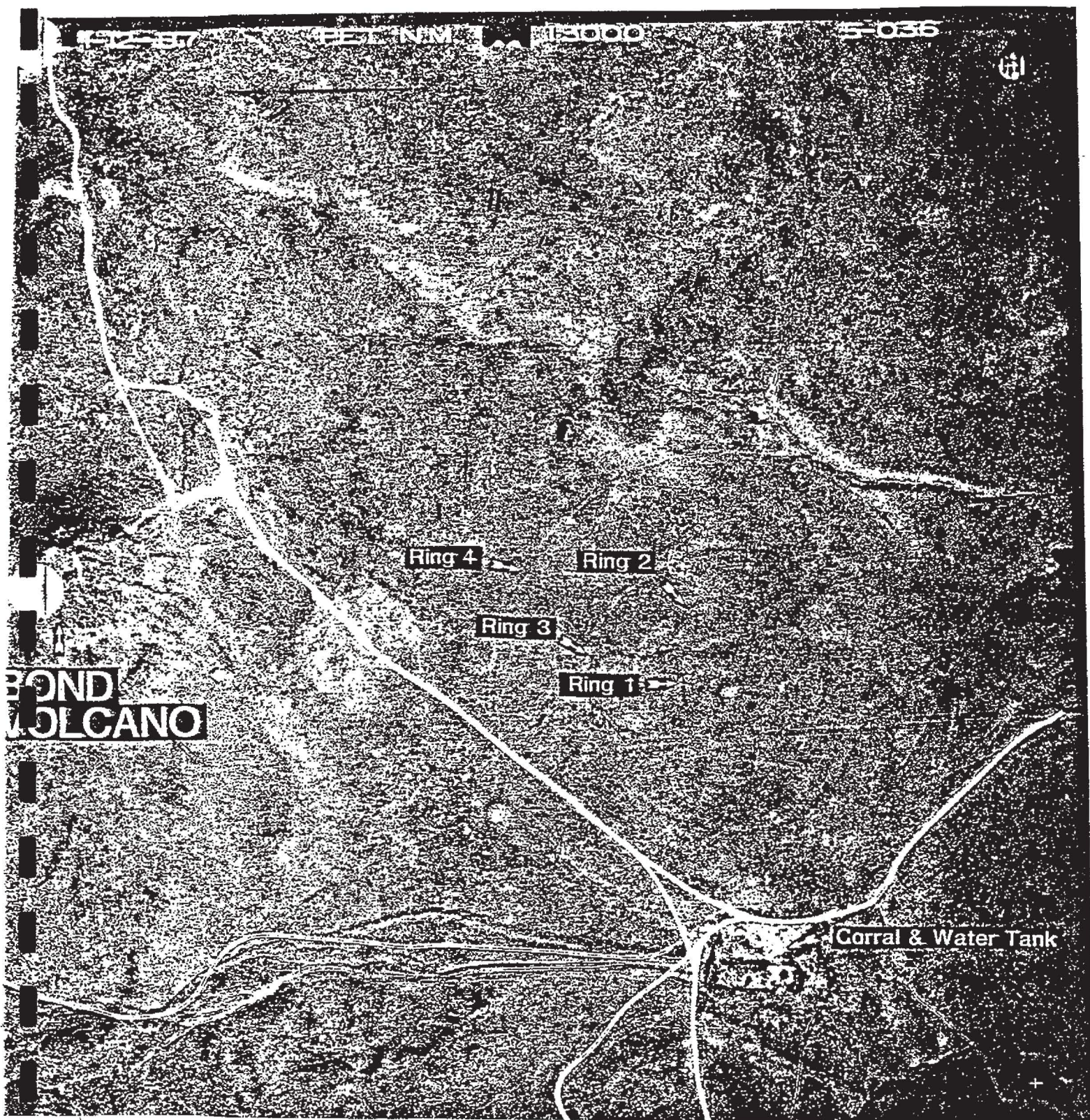


FIGURE 7.

Aerial photograph showing target area N-4 and corral and stock tank located east and southeast of Bond Volcano (prepared by A. Ireland, SWR-RCA).

In September 1991, an Explosives Ordinance Division team from Kirtland Air Force Base investigated the site, identifying M1A1 spotting charges and M85 concrete practice bombs, and noting that they were not hazardous. Apparently, some "live" bombs were also used, and as a result, the October 3, 1952, Certificate of Clearance issued for this target area states that "the area had been cleared of dangerous materials and recommended that the area be restricted to surface use only."²² The target site is located about 1,400 feet east of Bond Volcano, as shown on a sketch map of the site that was prepared in 1991 by Art Ireland of the Remote-sensing office of the National Park Service's Southwest Regional Office (figure 8).

The N-4 target area is one of four such areas included within the Kirtland Air Force Base Precision Bombing Range. The other target areas were identified as N-1, N-3, and New Demolitions. For additional information regarding the military use of the West Mesa, refer to the field notes gathered during this study, and appendix II.

In 1966, a motocross track was formally established on top of the mesa. The track was in use until 1984, and its layout is still evident in aerial photographs and on-site visits. According to monument staff, there is a second dirt-bike or motocross track located in the Northern Geologic Window. Again, no date for its use or development is available at the present time. Other recreational developments located on the mesa top immediately outside of the park boundaries (but on city open-space lands) include a model airplane field, which was established by the Albuquerque Radio Control Club in 1955; a radio-controlled car track; and an equestrian center. The dates of construction for the car-track and equestrian-center areas have not been established. However, the car-track development was formalized in 1993. All of these areas are actively utilized by the public, with the exception of the now-abandoned motocross track.

Sometime during the mid-20th century, the letters "J" and "JA" were whitewashed or painted on the eastern slopes of Vulcan and JA volcanoes (figure 9). The "J" was painted by students from St. Joseph College, which was established in 1951, and later re-named University of Albuquerque.²³ The painters of the "JA" have not yet been identified.

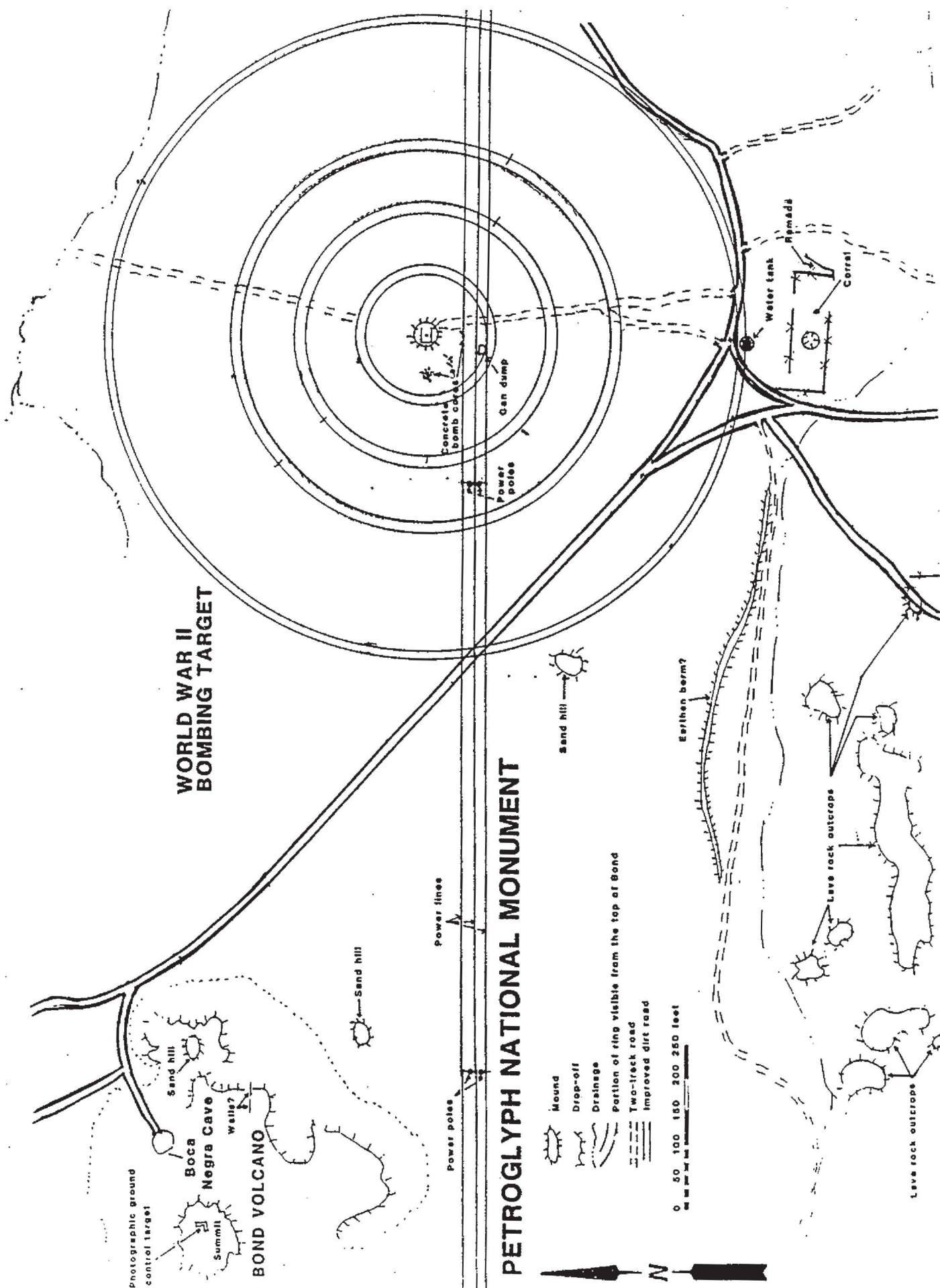
Prankster activities have also been noted within the study area. Sometime during the early 1880s, a group of pranksters encircled the prominent cone of Vulcan with refuse, and torched it. The resulting cloud of smoke rising from the volcano apparently alarmed

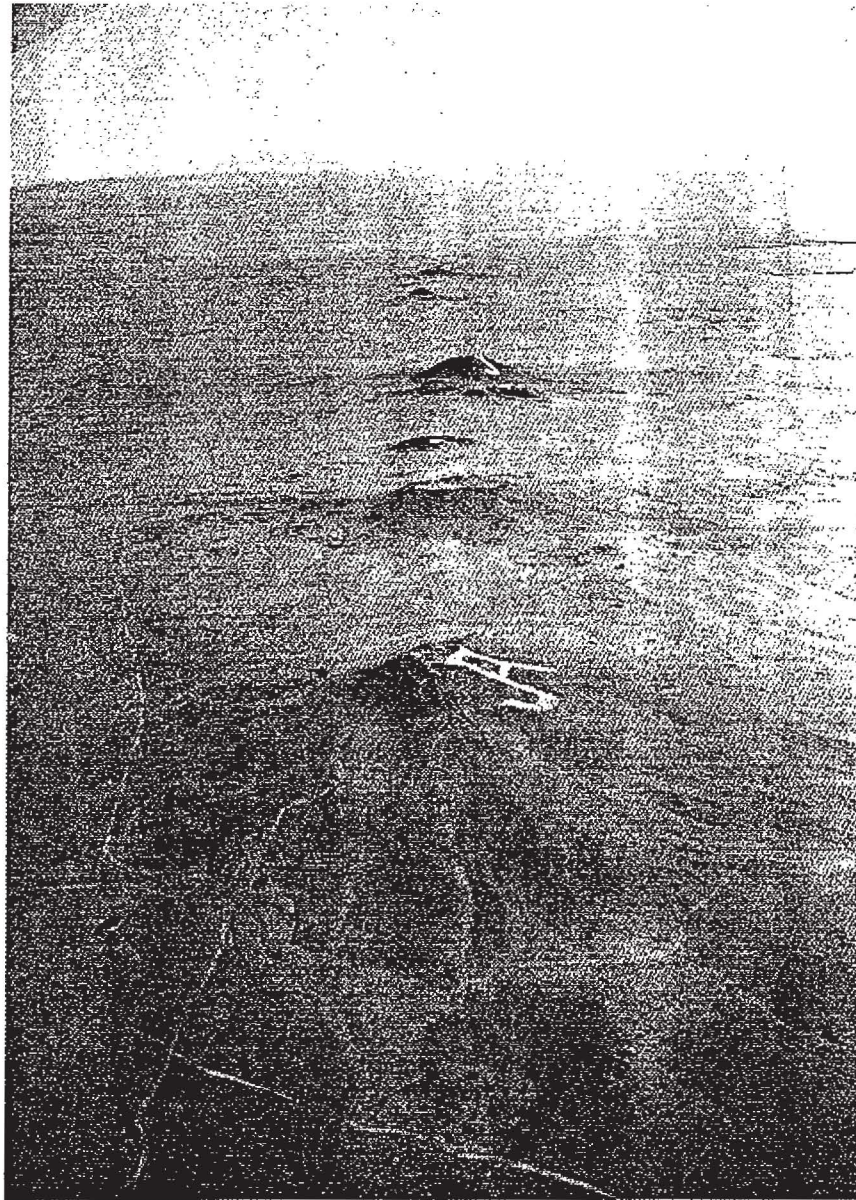
²² Herndon, Brigadier General Robert L. Findings of Fact Memorandum on Defense Environmental Restoration Program for Formerly Used Defense Sites.

²³ Kelley, Vincent C. Albuquerque: Its Mountains, Valley, Water, and Volcanoes. New Mexico Bureau of Mines and Mineral Resources. 1982. P. 102.

FIGURE 8.

Site sketch map showing target area N-4, east of Bond Volcano (prepared by A. Ireland, SWR-RCA).





Dick Meleski photo

ALBUQUERQUE VOLCANOES

Jemez and Nacimiento mountains on the northern skyline. Cones are aligned north-south along faults.

FIGURE 9 .

Oblique aerial of volcanoes with view to north. Note whitewashed letters JA and J on eastern sides of JA and Vulcan volcanic cones. No date for photo. Taken from Kelley, 1982.

many of the city's residents, who feared a possible eruption from the long-extinct volcano. The account was recorded in the city newspaper. In the 1960s, the prank was repeated by a group of University of New Mexico students who used old tires to encircle the summit of the cone. The resulting fire produced volumes of thick black smoke, and once again startled many of the city's residents. It is said that Edward Abbey--a well-known author of environmental books--was a participant in the 1960s prank.

SUMMARY

The lands included within the boundaries of Petroglyph National Monument represent several types of cultural landscapes representing a wide range of time periods. The identified cultural landscape resources include the following:

Prehistoric Period

Very little remains of the cultural landscape representing the early prehistoric period (circa 12,000 B.C.-6,500 B.C.). As the glacial ice flows retreated to the north, the climate changed; the landscape reflected the changes, as the vegetation evolved to accommodate an increasingly arid environment. The character-defining features associated with this early landscape are predominantly natural features, including the now-extinct playa lakes; the silt- and alluvium-covered gravel terraces associated with the Rio Puerco; the Rio Puerco and Rio Grande; Boca Negra Cave; and the volcanoes and escarpment of the West Mesa.

The cultural landscape associated with the middle to late prehistoric period (circa 6,500 B.C.-mid-16th century, European Contact period). An assortment of character-defining features have been identified as having a significant association with this prehistoric-vernacular landscape: the majority of the petroglyphs; the naturally occurring terraces utilized for horticultural purposes; numerous rock alignments; and natural features including the escarpment and volcanoes, vegetation (grasslands), Boca Negra cave, the Rio Puerco and Rio Grande, and surrounding landforms including mountains such as the Sandia Mountains and Mt. Taylor.

During the Proto-historic period (1540-1598--the European contact period), the landscape was much the same as the later prehistoric landscape. The introduction of various-sized holding pens and corrals to the broad expanses of the landscape quickly followed. The newly arrived Spanish colonists, like the area's indigenous Pueblo peoples, were attracted to the available arable lands along the Rio Grande and its tributaries. Before long, the two groups were sharing agricultural practices, crops, and other technologies, and the development of arable land was greatly expanded. Another result of the initial contact by the Spaniards was the subsequent abandonment of numerous pueblos and their associated agricultural

fields, and the dispersal of many people. According to reports made by some of the early explorers in the Middle Rio Grande Valley, the primary land-use activities were agriculture, residential occupation, and ceremony. The landscape's character-defining features associated with these activities would have included agricultural fields along the river bottoms and on the natural terraces found along the escarpment; a few agricultural areas along the mesa top; petroglyphs; the broad, sweeping grasslands of the mesa top and below the escarpment; and natural landforms such as the volcanoes, escarpment, and surrounding mountain ranges.

Historic Period

Numerous changes and modifications occurred within the Middle Rio Grande landscape during the Spanish Colonial period (Spanish Frontier period--1598-1821). With the arrival of Oñate's official colonizing party in 1598, land-use activities in New Mexico were transformed. The lush grasslands were soon grazing lands for the livestock that accompanied the Spanish colonists. The introduction of holding pens and corrals of various sizes to the broad expanses of the landscape quickly followed. The newly arrived Spanish colonists, like the area's indigenous Pueblo peoples, were attracted to the available arable lands along the Rio Grande and its tributaries. Before long, the two groups were sharing agricultural practices, crops, and other technologies, and the development of arable land was greatly expanded. The first Spanish land grants were established during the early 17th century, and the boundaries for these grant lands were delineated using natural features. The character-defining features associated with the Spanish Colonial landscape include the grassland vegetation that provided grazing range for the newly introduced stock; the identified boundaries of the Atrisco and Alameda grants; the stacked stone corrals and holding pens; period petroglyphs revealing crosses, brands, and initials; and possible religious-use areas, including Penitente sites, descansos, and shrines.

The landscape in and around the West Mesa changed little from the Spanish Colonial period to the Mexican Territory period (1821-1846). Most of the lands continued to be utilized primarily for the grazing of sheep herds. Attempts were made by the Atrisqueños to expand their burgeoning sheep industry by moving to lands along the Rio Puerco, but frequent raids by the Navajo and Apache convinced them to return their flocks to the better-defended West Mesa lands. Because of the continuation of the same land-use activities, the character-defining features associated with this period are the same as those identified for the preceding Spanish Colonial period.

Once the New Mexico territory became part of the United States in 1846, new patterns and land-use practices and technologies were introduced to, and modified, the landscape. Ownership rights to lands that were included within Spanish land grants were challenged in the courts by the American settlers and business interests.

Lands that could not be defended by their grant heirs were included in the territorial survey that gridded the land into township, range, and section. The historic landscape of the West Mesa now included grant lands, as well as surveyed sections that were held in both private and public ownership. Land-use activities continued to involve sheep grazing, as well as cattle ranching, commercial resource extraction and exploration, research of the area's natural and cultural resources, military training, and recreational and urban development. The character-defining features associated with the American period (1846-1944) landscape have been identified, and include boundaries (fences, survey markers, and natural landforms); aqueducts and stock tanks; military target ranges; mining quarries, pits, and shafts; and stacked stone corrals and holding pens.

$$250' \times 75' = 18,750$$

ANALYSIS

EXISTING CONDITIONS

As discussed earlier in this report, the land included within the boundaries of Indian Petroglyph National Monument is comprised of a conglomerate of various types of cultural landscapes. None of the landscapes found within the park are present in their entirety. Although the escarpment and its wide array of petroglyphs are the primary focus of visitors who come to the park, the broad open expanses of the mesas and the dramatic visual effect of the volcanoes are "familiar and cherished features of the Albuquerque landscape."²⁴

The park's lands are criss-crossed with numerous roads, jeep trails, and unofficial paths. The Boca Negra Unit of the park includes Indian Petroglyph State Park, which currently provides visitors with a loop drive, asphalt trails, picnic shelters, restroom facilities, and a contact station. Immediately adjacent to the park lands along the mesa top are some recreational developments that have been established on the city's open-space land. These developments are within the city's Boca Negra Park, and include three parking areas, an equestrian center, a model-plane runway, a radio-controlled car track, spectator stands, and portable restroom facilities.

The previously existing Volcano Park has also been included within the park boundaries; however, there is presently minimal development at this location, with the exception of a parking area.

The National Park Service has remodeled two residential buildings, and established a visitor contact station and a ranger activities office. Two additional residential structures and their associated buildings are scheduled for removal some time in the future. Immediately west of the visitor contact station there is a private residence, which is discussed in the General Management Plan.

Proposed alternatives for additional visitor and administration facilities, trails, and roadways are currently being prepared as part of the park's ongoing General Management Plan. Both the General Management Plan and this Cultural Landscape Overview study address the increasing demands for utility and transportation corridor rights-of-way. At the present time, there are electrical transmission lines and gas pipelines that transverse the park lands. Along with the continued encroachment of residential development along the base of the escarpment and along the mesa top

²⁴ Sargeant, Kathryn and Mary Davis. Shining River: Precious Land. An Oral History of Albuquerque's North Valley. 1986. The Albuquerque Museum.

will come demands for additional power lines, drainage control structures, and circulation systems. The recommendations section of this report discusses both existing and possible future right-of-way easements and their effects upon the landscape.

CHARACTER-DEFINING ELEMENTS

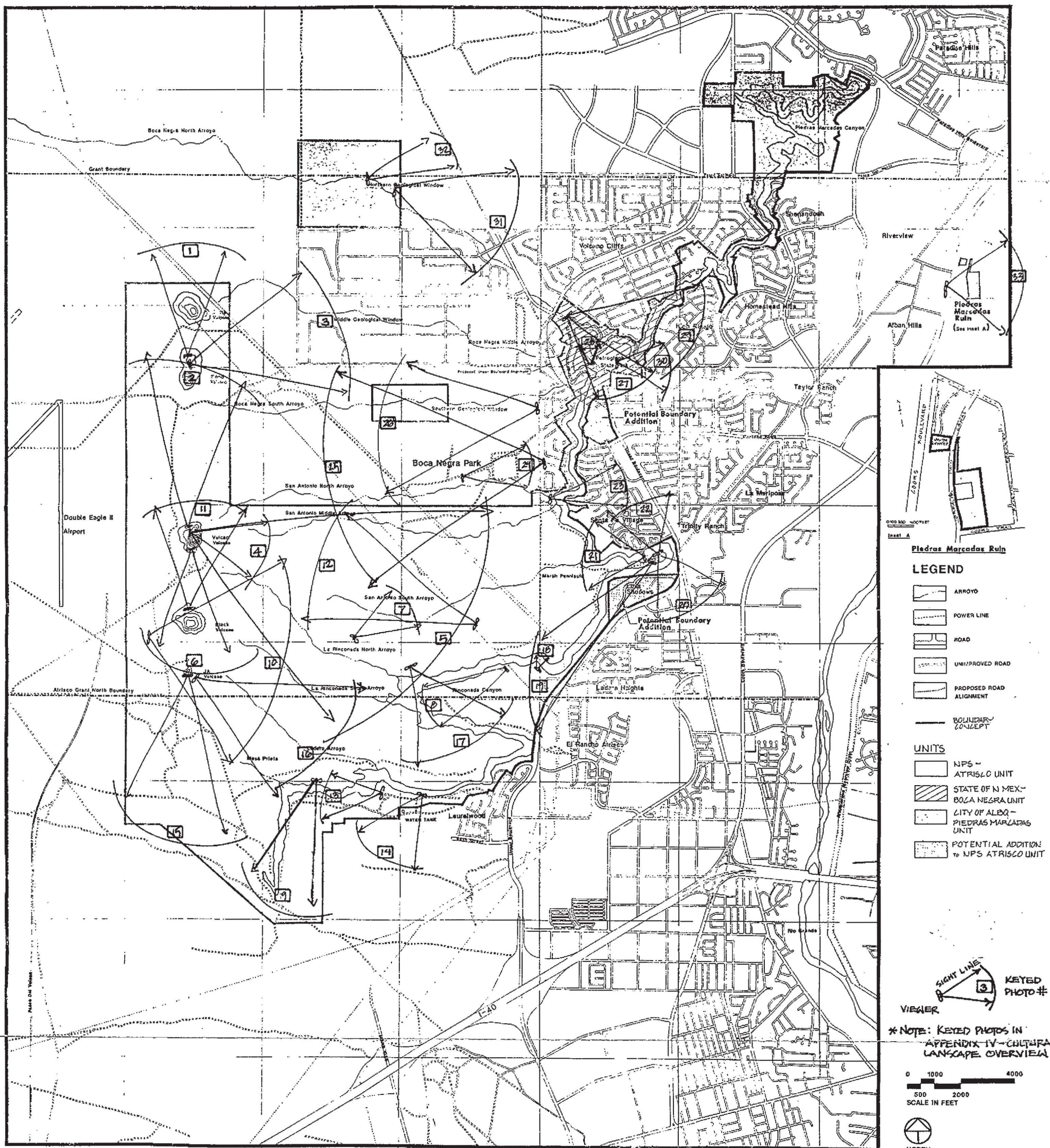
Views/Vistas

The landscape associated with Petroglyph National Monument is a significant visual landmark for the citizens of Albuquerque. Both the escarpment and the distinct line of volcanoes along the western edge of the mesa have served as a visual boundary, which creates the northwestern limits of Albuquerque. The dramatic rise of the five volcanic cinder cones above the open and undeveloped mesa are easily visible from most locations in the city, and from various points along the major transportation corridors, such as Interstate 25 and Interstate 40.

Many of the vistas available for visitors and local inhabitants alike include the escarpment and volcanoes, with one or more of the surrounding natural landforms, such as Mount Taylor; the Rio Puerco and Rio Grande valleys; and the Sandia, Manzanita, and Manzano Mountains. There is a wide array of views both into and away from park lands as a result of the open and expansive nature of the landscape. It is highly probable that the viewshed was also a paramount issue with regard to prehistoric site locations. Numerous views were photographed in and around the park, and these photographs and their locations have been keyed to an area map (figure 10). Additional view-shed analyses for specific areas within the park have been conducted by the National Park Service Environmental Data Analysis Center (EDAC) in Albuquerque.

Litton has defined approximately seven different landscape types, using visual characteristics as a determinant. It has been determined that six of those seven types are present within the landscape of Petroglyph National Monument: the enclosed landscape, the feature landscape, the detail landscape, the panoramic landscape, the focal landscape, and the ephemeral landscape. Refer to appendix III for definitions of these landscape types.

The enclosed landscape is represented by the views into some of the narrower rincons and the enclosed spaces within the geologic windows. These views are somewhat restricted, and the area is defined by both wall and floor characteristics. The feature and the detail landscape may both be experienced within some of the enclosed areas. Views of the petroglyphs themselves may fall into both of these categories. The feature landscape is dominated by objects that catch the eye, while the detail landscape focuses on the immediate foreground, where minor details may be discerned. The detail landscape is for views taken at a pedestrian pace. Trails into and through concentrations of petroglyphs will provide



visitors with opportunities to experience the detail landscapes within the park.

Although some panoramic views are available from various locations within the park that are below the escarpment, the most expansive views are experienced from either the mesa top or from the volcanoes themselves. From these upper-elevation locations, 360-degree views of the surrounding panoramic landscape are readily available to visitors. As visitors approach park lands from any direction, the broad and open panoramic views that include the escarpment, mesa, and volcanoes, along with the surrounding natural landforms, probably enhance feelings of anticipation and help set the stage for a pleasurable experience with the resource. To a lesser degree, there are some focal landscape views within park lands. The focal landscape includes a series of essentially parallel objects that are seen in alignment, such the bosques (forests of cottonwoods) that run along the banks of the Rio Grande, and the alignment of volcanic cinder cones that follows a fissure line along the top of the mesa.

The ephemeral landscape is clearly dependent on outside influences, such as atmospheric and weather conditions. This type of visual landscape is characterized by its transitory nature, and may be represented at innumerable locations within the park. An example of the ephemeral landscape might be seen in the play of shadows and light upon the panels of petroglyphs found along the lava escarpment. Depending upon the angle of lighting, some petroglyphs will be visually enhanced, while others are masked from sight. Another example of the ephemeral landscape is experienced by views that might be temporarily altered by the occasional atmospheric pollution that hangs like a heavy veil over the Rio Grande Valley and the City of Albuquerque (figure 11).

Out of all the various types of visual landscapes that have been identified within Petroglyph National Monument, the panoramic, enclosed, and detailed views have been identified as character-defining elements. The panoramic views allow park visitors to visually associate park lands with the surrounding physiographic and cultural environments, while the enclosed and detailed views provide for memorable experiences within this unique landscape. Although panoramic views may be experienced from numerous locations within the park, the enclosed and detailed views are limited to specific locations such as Boca Negra Canyon, the Northern Geologic Window, the terrace areas along Mesa Prieta, and the terrace areas along Mesa Prieta, and other isolated areas with heavy concentrations of petroglyphs. These areas have been determined to have high visual integrity, and are sensitive to modern intrusions.

Existing visual intrusions have been identified within the park landscape, and consist primarily of electrical transmission lines. Other visually intrusive features that are readily visible from within the park but are on lands outside the park boundaries include water storage tanks, electrical substations, and in some instances residential and commercial development. For the purposes



FIGURE 11. Photograph showing atmospheric pollution hovering
over Rio Grande Valley.

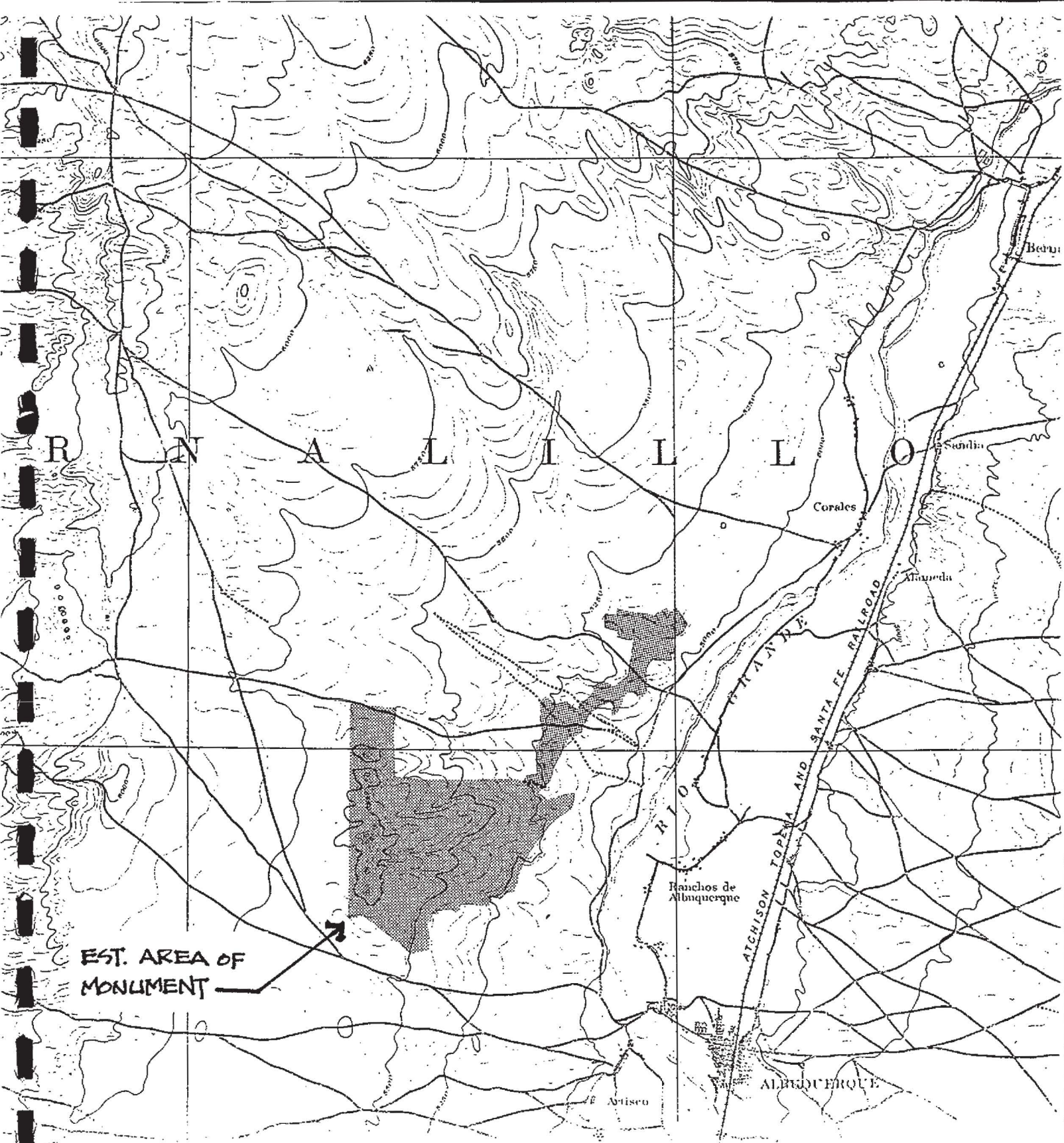


FIGURE 12 . 1893 edition of USGS topographic map, Bernalillo, NM.

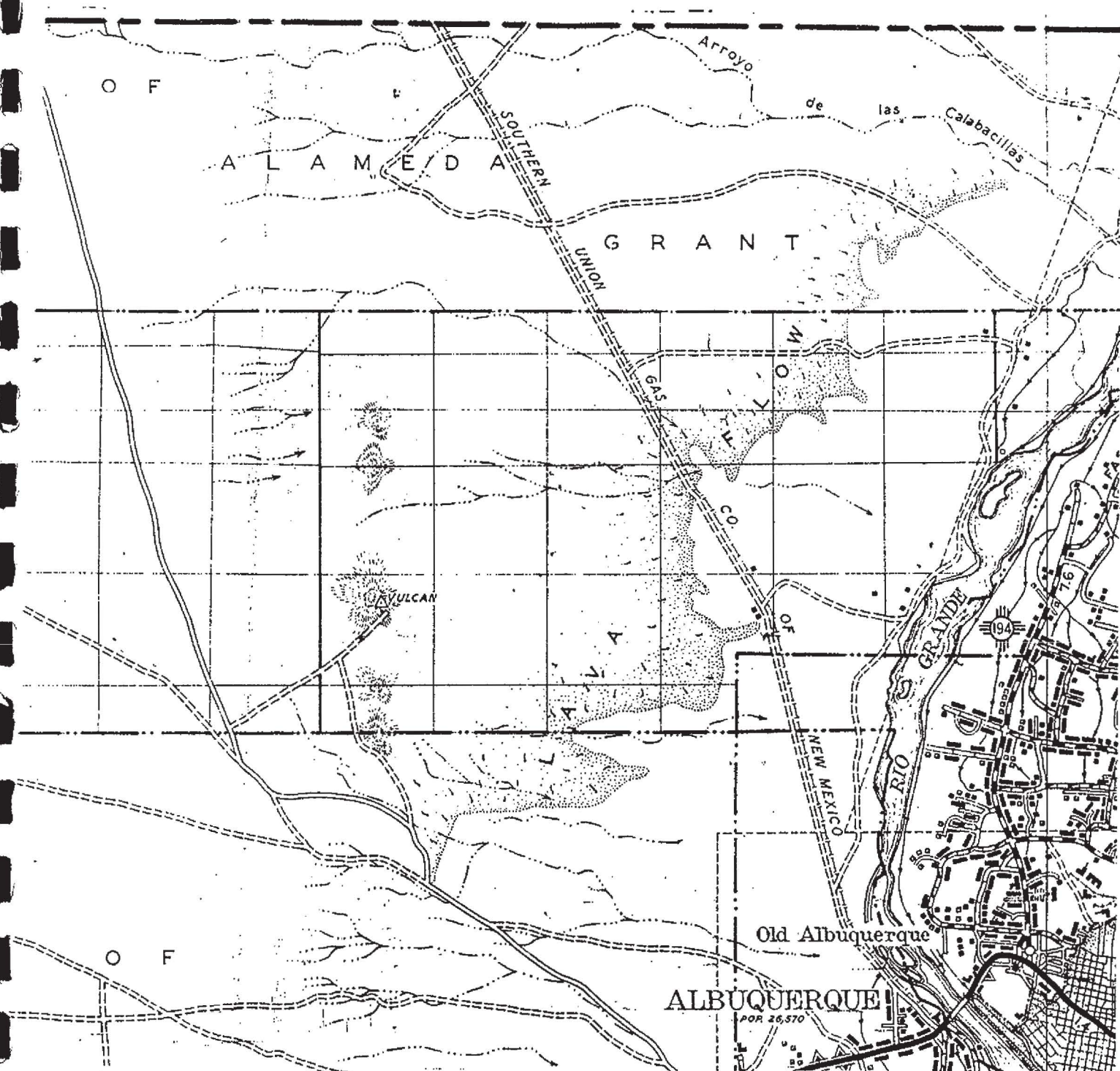


FIGURE 13. 1939 General Highway Map of Bernalillo County, NM.



FIGURE 14. 1957 General Highway Map of Bernalillo County, NM.

of this study, urban development was only identified as being visually intrusive when it encroached upon the escarpment or filled the open canyons immediately below the escarpment. This approach is consistent with the designated "Impact Area" adopted by the City of Albuquerque in the Northwest Mesa Escarpment Plan.²⁵ At the present time, development on the mesa top is limited. However, proposed subdivision developments for the mesa pose a significant threat to the visual integrity of the resource as a whole, because they will have a detrimental effect on the visual transition from open space to massed development.

The significance of the West Mesa and its associated lava escarpment and volcanoes cannot be overestimated, because the group serves as a signature visual landmark for the City of Albuquerque. In *The Thin Mountain Air*, author Paul Horgan describes "those features which such great names stood for--the Rio Grande, the Sandia Mountains, the mesa at Albuquerque, the volcanoes on the horizon west of the river valley."²⁶ Horgan continues his description of the area by stating, "through miles of diamond-clear light the volcanoes to the west rising from a long, half-buried crust of black lava lay against the far horizon like those man-made deities of Egypt which seemed to become natural earth forms."²⁷

Vegetation

The plant communities that existed within the West Mesa landscape during the Pleistocene and Post-Pleistocene periods differed dramatically from those existing today. The climate was appreciably cooler and wetter, and was capable of supporting more mesic vegetation. The vegetational patterns were probably represented by a mosaic of interspersed grasslands and woodlands that were gradually replaced by broad, open, grassy plains as the moisture levels decreased.²⁸ Research on the fluctuations of moisture levels during this Post-Pleistocene period has revealed that the gradual decrease in moisture resulted in environmental conditions similar to those of the present day by circa 6,500 B.C. At first glance, the vegetation that is found within park lands seems somewhat limited in species diversity. However, those who note the subtle differences in the grasses, shrubs, and numerous annuals scattered throughout the landscape will find that a wealth of nutritional and medicinal materials are available.

²⁵ City of Albuquerque, Parks and Recreation Department, Open Space Division and Planning Department, with Southwest Land Research, Inc. Northwest Mesa Escarpment Plan. 1988.

²⁶ Morgan, Paul. *The Thin Mountain Air*. Farrar, Straus, and Giroux, NY. 1977. P. 66.

²⁷ *Ibid.*, p. 267.

²⁸ Tainter, Joseph and Frances Levine. *Cultural Resources Overview: Central New Mexico*. USDA Forest Service and Bureau of Land Management. 1987. P. 13.

The vegetation found within the park boundaries is characterized by broad expanses of grassland. According to the Bernalillo County Soil Survey, galleta and black grama grasses are the dominant plant species found on the West Mesa.²⁹ Other grasses include sand dropseed, spike dropseed, mesa muhly, silver bluestem, Indian ricegrass, three-awn, bluegrama, and side-oats grama. The dominant shrubs found scattered through the landscape are four-wing saltbush (*Atriplex canescens*), winterfat, and wolfberry. Random clusters of juniper (*Juniper monosperma*) occur along the primary drainages that run eastward across the mesa toward the escarpment and the Rio Grande river valley below. Reinhart refers to these clusters as open juniper savanna communities.³⁰ Further discussion of the plant diversity within the park is included in Schmader and Hays,³¹ along with some hypotheses for plant distribution along both the escarpment and mesa top.

Additional plant species found on park lands include snakeweed (*Gutierrezia* sp.), *Mirabilis* (*Mirabilis* sp.), desert sumac (*Rhus microphylla*), rabbitbrush (*Chrysothamnus nauseosus*), Russian thistle (*Salsola Kali tenuifolia*), Mormon tea (*Ephedra*), yucca (*Yucca glauca*), pricklypear (*Opuntia erinacea*), and Fremont cottonwood (*Populus fremontii*).

A list of plants or wild herbs (*yerbas del campo*) that are noted for various traditional uses by both Indians and Hispanics and have also been identified within the park boundaries is included in the following chart:

²⁹ USDA, and USDO, in cooperation with New Mexico Agricultural Experiment Station. Soil Survey of Bernalillo Co., and Parts of Sandoval and Valencia Counties, New Mexico. June 1977.

³⁰ Reinhart, Russell. 1968.

³¹ Schmader and Hays.

COMMON NAME	BOTANICAL NAME
Jerusalem artichoke	Helianthus tuberosus
wild currant	Ribes species
canaigre/dock	Rumex species
willow	Salix species
Apache plume	Fallugia paradoxa
mahonia	Berberis species
coneflower	Rudbeckia hirta
coneflower	Rudbeckia laciniata
horehound	Marrubium vulgare
Mormon tea	Ephedra species
osha	Ligusticum porteri
yucca	Yucca species
chimaja	Cymopterus fendleri
juniper	Juniperus monosperma
pricklypear	Opuntia species
squawbush	Rhus trilobata
altamisa	Artemesia franscriodes
chamiso	Artemisia tridentata
orteguilla	-
polco chino	Hedeoma oblongifolium
yerba buena	-
amole	Yucca spp.
bolsa de pastor	Capsell abursa-pastoris

Response to Natural Features

Throughout the range of human occupation and utilization of the landscape in and around the West Mesa, people have definitely responded to the wide array of natural features that the area has to offer. During the early prehistoric periods (prior to the retreat of the great ice sheets), the volcanoes interrupted the flow of drainage, and resulted in large playa lakes, which provided a fairly stable water source atop the mesa. These lakes attracted large game, and served as premier hunting sites. Although there are some intermittent playas and small catchment basins that hold

water during the late summer rainy season, there are no known permanent water sources on the mesa.

The broad expanses of grassland and the specialized ecological niches in and among the escarpment's large lava boulders were exploited for both faunal (small- and medium-sized game animals) and floral resources. Archeological and ethno-historical research has shown that numerous plant and animal species have been collected and utilized for dietary, ceremonial, and medicinal purposes. The use of these plant materials and various minerals continued into the historic period, and was adopted by the Hispanic settlers--and to some degree continues today. A list of native plants commonly found within the park boundaries that have also been identified as having desirable uses is included in the preceding discussion on vegetation.

Although many of the early prehistoric peoples in the area supplemented their nutritional, medicinal, and ceremonial needs by collecting and using naturally occurring native plant species, later cultures began to actively practice horticultural techniques to manipulate and encourage desired plant species. Possibly as early as 2,000 to 1,500 B.C., the naturally formed terraces found along the escarpment were being used for cultivation purposes. These areas provided the plants with protection from the drying winds; and the dark lava boulders along the escarpment absorbed and generated additional heat, which in effect increased the growing season--often by as much as 30 days in these specific areas. Crops grown on the terraces have not been identified; however, it should be noted that immediately adjacent to the terraces there are numerous grinding slicks for the processing of plants and other materials.

The formerly exposed gravel terraces located to the southwest of the volcanoes provided a wealth of raw material in the form of chert, chalcedony, petrified wood, obsidian, basalt, and quartzite. Other native materials that were available locally or through trade included turquoise, red and yellow ochre, selenite, mica, and Jemez obsidian. All of these materials break with a conchoidal fracture, and were skillfully fashioned into a variety of tools, and were also used for other purposes. Archeological excavations have revealed that Boca Negra cave, located along the northeastern side of Bond Volcano, was utilized for shelter and occupation. Numerous other small rock overhangs or shelters around the volcanoes and the escarpment were probably used in a similar fashion, in addition to being used for shrines and ceremonial activities.

Later prehistoric peoples also made use of the caves and overhangs for shelter, and the site's raw materials such as chert, obsidian, and other minerals for both tool-production and ceremony. Lava boulders along the escarpment were selected for either desirable aspects or orientation, and inscribed with myriad petroglyphs. Preferred rock panels appear to be those with smooth-finished faces. These boulders were also utilized for the grinding of various plants and minerals.

Archeological research has noted that during the various prehistoric periods, dunes and arroyos were the primary landforms that influenced the siting of use and occupation areas.³² During the Archaic period, sites are most often found on the south side of the dunes, and Pueblo sites are usually in a similar position but closer to the dune crests.³³

Drainage patterns were intentionally manipulated during both prehistoric and historic time periods through the use of stacked stone diversion dams. Stacked stone and brush were used to construct sheep pens and corrals, while landforms such as lava outcrops, drainage canyons, and the volcanoes were used to help determine the locations of these historic period structures because they functioned as natural windbreaks. The use of astronomical resources was also very important for prehistoric and historic groups associated with Petroglyph National Monument landscapes. The night sky was used to calendar the change of seasons, determine times for ceremony, assist with orientation and navigation through the landscape, forecast weather conditions, and determine schedules for breeding and lambing of livestock. The shepherds actively used the night sky to determine when the rams would be let out with the ewes, so that they could ensure that the lambing period would coincide with the waxing of the full moon, thereby giving them sufficient light through the night to assist the ewes.

Spatial Organization

The patterns of spatial organization that characterize the landscape associated with Petroglyph National Monument range from broad and diverse systems encompassing whole regions, such as the Rio Grande and adjacent drainage basins, to open-space lands associated with a single urban center, such as Albuquerque. As is the case with the majority of this landscape's character-defining features, these patterns are generally quite subtle--but this does not in any way diminish their overall significance.

The patterns that characterized the West Mesa landscape during the early prehistoric period can only be surmised from the available archeological data, and are therefore somewhat general in nature. The site's natural features, such as the playa lakes that were once located to the northwest of the volcanoes and the exposed gravel terraces, were areas of primary importance and focused activity. It should also be noted that the landscape within Petroglyph National Monument had a very specialized pattern of use and organization during the prehistoric period, with some areas selected as quarry or "lithic reduction" sites and other areas serving as either occupation or agricultural use areas. Little else can be stated regarding the overall spatial organization of this early landscape without being purely conjectural.

³² Reinhart, 1968.

³³ Ibid.

The cultural transition that occurred between the Archaic and Basketmaker traditions, or cultural periods, resulted in a gradual increase in sedentary life-ways and varied land-use activities. As the environment became increasingly arid, the people living in the Rio Grande Valley shifted their dependence from the once-prolific megafauna, and adapted themselves to hunting medium- to small-sized game, and increased their dependence on available plant materials. By 1,800 B.C., varieties of maize were being cultivated in the Rio Grande Valley. As settlement patterns shifted from scattered field houses on the upland ridges to the development of pueblos in the river valleys, populations increased and agricultural technologies were developed.

Some of the patterns that characterized the spatial organization of the later prehistoric cultural landscape (6,500 B.C.-A.D. 1540) would have included settlement areas such as Piedras Marcadas Pueblo, which is located in close proximity to the Rio Grande; ceremonial and religious areas along the escarpment, and in the immediate vicinity of the volcanoes; and specialized agricultural areas located on the mesa top, along the naturally occurring terraces of the escarpment, and also adjacent to the river.

During the Spanish Colonial period, the landscape was officially granted and platted to various Spanish families for their use and development. Each of the land grant corporations divided their lands into functional use areas, and managed them accordingly. The portion of the Atrisco grant that is included within the park was utilized as common grazing lands for the families associated with the grant. Other use areas within the Atrisco grant are located south of park lands. Based on field reconnaissance, it appears that the area known as the Northern Geologic Window was used in a similar fashion by the heirs of the Alameda grant. As stated earlier, little information has been gathered regarding the development and use of lands within the Alameda grant.

The overall organization of the Spanish Colonial landscape did not change much, if any, during the Mexican Territory period; the land-use activities simply continued.

Several changes in the spatial organization of the West Mesa area occurred with the transition from Mexican to American territory in 1846. The lands included within the two Spanish land grants remained relatively unchanged through the 19th century and into the early 20th century, while the unclaimed lands located on the mesa top were gridded and placed in both private and public ownership. A lack of available water kept development limited in these tracts through the 19th and early 20th centuries. Specialized use areas were established, beginning with the leasing of lands around the volcanoes for mining operations and ending with the lease of several thousand acres of West Mesa lands for the development of the Kirtland Air Force Base Precision Bombing Range.

By the middle of the 20th century, a few wells were drilled on the mesa top, and the availability of fresh water allowed ranchers to graze cattle in areas once only suitable for sheep. The

accessibility of water also increased the potential for private development. Volcano Ranch was the principal private development established on the mesa in the vicinity of what are now park lands. Public developments soon included water towers, utility easements, designated circulation routes (including major thoroughfares and flight paths), and recreation areas.

Cluster Arrangement

Each of the various time periods during which the park's landscape has been utilized has its own array of clustered features. Clustered features noted during this study include concentrations of petroglyphs, sheep pens, and recreation sites.

Archeologists have identified clusters of lithic-collection and primary-preparation sites in association with the concentration of gravel terraces located southwest of the volcanoes. The use of these sites for material collection probably dates from the Paleo-Indian period through the Pueblo periods. Other cluster arrangements associated with prehistoric land-use activities include concentrations of petroglyphs and various types of rock alignments, such as the stone rings atop Marsh Peninsula.

During the historic period, clusters of sheep pens and corrals were scattered through the landscape. Concentrations of historic petroglyphs (brands, initials, and crosses) are often associated with the pens and corrals. Other noted clusters include historic and contemporary trash-disposal areas, relocated boulders with petroglyphs, contemporary petroglyphs, and developed recreation areas.

The cluster arrangements found within the landscape at Petroglyph National Monument have been identified as character-defining for both the prehistoric and historic period cultural landscapes. The majority of these clustered features are subtle in nature, but once identified, they seem to become more visible.

Circulation

Circulation within and through the West Mesa area was a network of footpaths and trade routes until the middle of the 16th century. It has been suggested that some of the petroglyphs mark specific trails or routes through the landscape.³⁴ Horses were introduced to New Mexico during the Spanish Exploration period, and by 1600, Spanish settlers mentioned horses and sheep as livestock kept in some of the pueblos. Horse trails across and below the West Mesa were soon followed by cart paths, and later by roads. A primitive two-wheeled cart called a *caretta* was first used along the Chihuahua Trail in or around 1582. Wagons and other wheeled vehicles of transport were not introduced into the area until

³⁴ Ike Eastvold. Personal communication with park staff.

eastern traders made their way along the Santa Fe Trail, hoping to conduct business with the new Mexican territory.

It appears that historically there were very few roads that ascended the escarpment. A 1893 USGS topographic map shows some of the early roads that run below or south and east of the escarpment, as well as roads to the north and west of the West Mesa. No roads or unimproved trails are shown traversing the mesa top (figure 12). It is the understanding of other researchers that livestock were moved periodically onto the West Mesa by means of a curvilinear trail leading from the river valley up around the south end of Mesa Prieta, where there is a natural topographic break in the escarpment. It has also been noted that other trails led from Piedras Marcadas Pueblo past Los Metates and up to the mesa top.³⁵ A comprehensive oral history/ethnohistory would likely shed more light on this and similar subjects regarding land use of the area. A 1939 highway map of Bernalillo County shows the roads existing within the park landscape, and these are limited to roads along the bases of JA, Black, and Vulcan volcanoes, and a service road that follows along the Southern Union Gas Co. pipeline, located in the northeast corner of what are now park lands (figure 13).

The 1957 General Highway Map of Bernalillo County depicts even fewer roads than the 1939 map, because it does not include the unimproved roads leading to the volcanoes (figure 14). However, this map does include the flight route utilized by Frontier Airlines, and this flight path crosses over the northeastern vicinity of the escarpment, roughly parallel to the route of the gas pipeline. Other maps, including the 1954 and 1960 edition USGS topographic series, reveal that the mesa top was gridded by jeep trails; ranch roads; and recreation routes leading to city open-space lands, and later to Boca Negra and Volcano parks. These topographic maps also include access and service roads that parallel the utility transmission lines traversing the mesa top.

Sometime during the late 1960s or early 1970s, a series of streets and cul de sacs were designed and bladed into the thin soils along the mesa top and the northeastern escarpment area as a real estate promotional effort for the Volcano Cliffs subdivision. These patterns are still readily visible in aerial photographs.

Circulation patterns in the form of paths and trails serve as character-defining features within the prehistoric landscape, while utility and service-oriented circulation routes define the historic period of land use on the West Mesa. Circulation is also a significant component of the contemporary ethnographic landscape, with its associated spirit trails and ceremonial routes that connect the escarpment and volcanoes with other valued resources, such as Mount Taylor and the Sandia ranges.

³⁵ Personal communication from Diane Rhodes, NPS/DSC.

Boundaries

Although the boundaries of the prehistoric cultural landscape most probably reflected a social, political, and religious land base, the landscape would have been utilized by diverse groups of indigenous peoples. The boundaries would have been established using a variety of markers--predominantly natural landforms. For the purposes of this study, it is assumed that the entire acreage of Petroglyph National Monument is but a small component of the entire Middle Rio Grande prehistoric cultural landscape. However, this component landscape is significant in and of itself, in that its use was unique because it apparently focused on religious and ceremonial use centered around the escarpment and the volcanoes (figure 15).

The boundaries that define the landscapes associated with the historic period (1540-1944) also reflect political, social, and economic conditions and events. These boundaries have been surveyed and platted, and are therefore more readily delineated for research and land-management purposes. The boundaries of the early Spanish land grants are described in Spanish Colonial archival documents, as well as in later 19th-century and early-20th-century litigation cases. The plat for the original Town of Atrisco grant and its 1768 extension are included in Metzgar's article outlining the development history of the grant³⁶ (figure 16). Lands from the Town of Alameda grant are also included within the park boundary. The Alameda grant was established in 1710, and the established boundaries for this grant are delineated in figure 17. The boundaries of these early grant lands were probably not fenced until the early 20th century. One site located at the back of Rinconada Canyon seems to support the contention that piles of rocks or cairns served as boundary markers.³⁷ Fence lines currently delineate the Atrisco lands in the vicinity of the park, and serve to contain the few herds of cattle that continue to graze on this property.

Additional historic boundaries established within park lands include private and public ownership parcels defined within townships, blocks, and sections. Numerous contiguous parcels were owned by both the City of Albuquerque and the State of New Mexico (figure 18). The boundaries of War Department Bombing Range N-4 were delineated based on land-ownership patterns existing during the 1940s. To facilitate acquisition of the lands for the establishment of the range, the military focused on public lands such as the parcels owned by the city and state along the West Mesa, and thereby avoided the grant lands surrounding the area (refer to figure 6).

³⁶ Metzgar, Joseph V. "The Atrisco Land Grant, 1692-1977," in *New Mexico Historical Review* LII:4 1977. P. 271.

³⁷ Eric Brunneman. Petroglyph National Monument. Personal communication. April 1994.

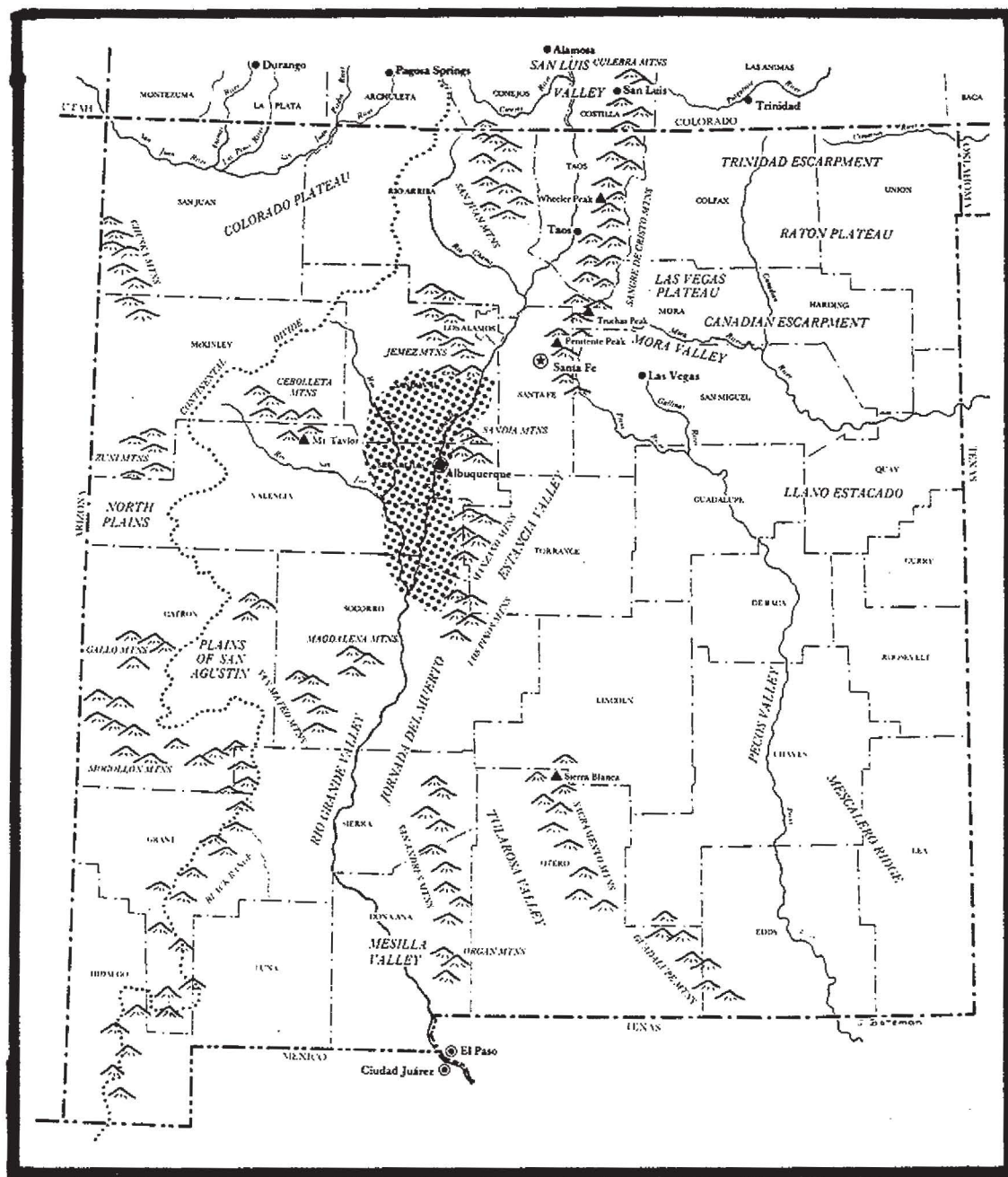
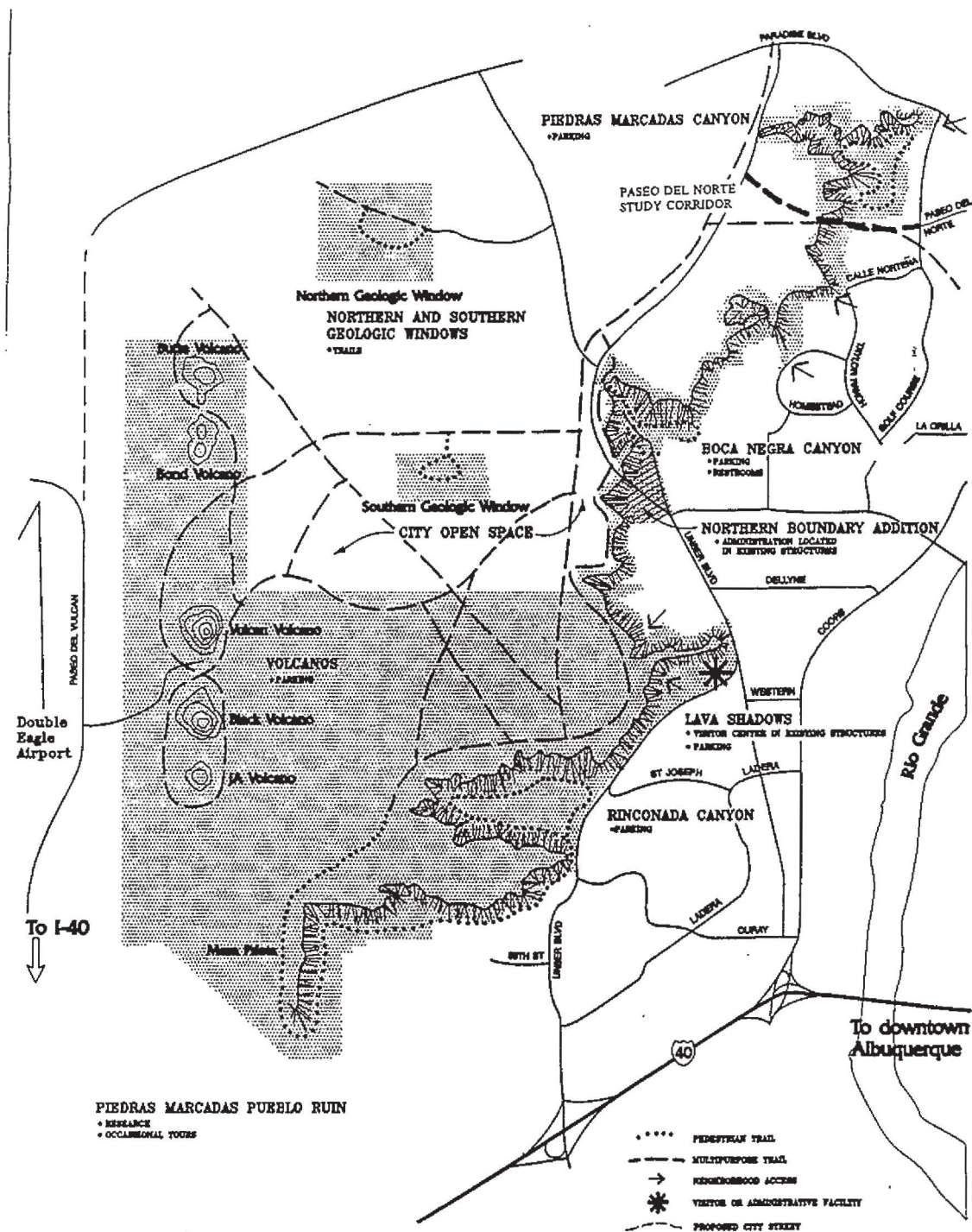


FIGURE 15.

Figure A represents a schematic map showing the estimated boundaries for the prehistoric vernacular landscape of the Middle Rio Grande Valley.



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FIGURE 15.

Figure B represents the boundaries for the prehistoric vernacular component landscape identified within the boundaries of Petroglyph National Monument.

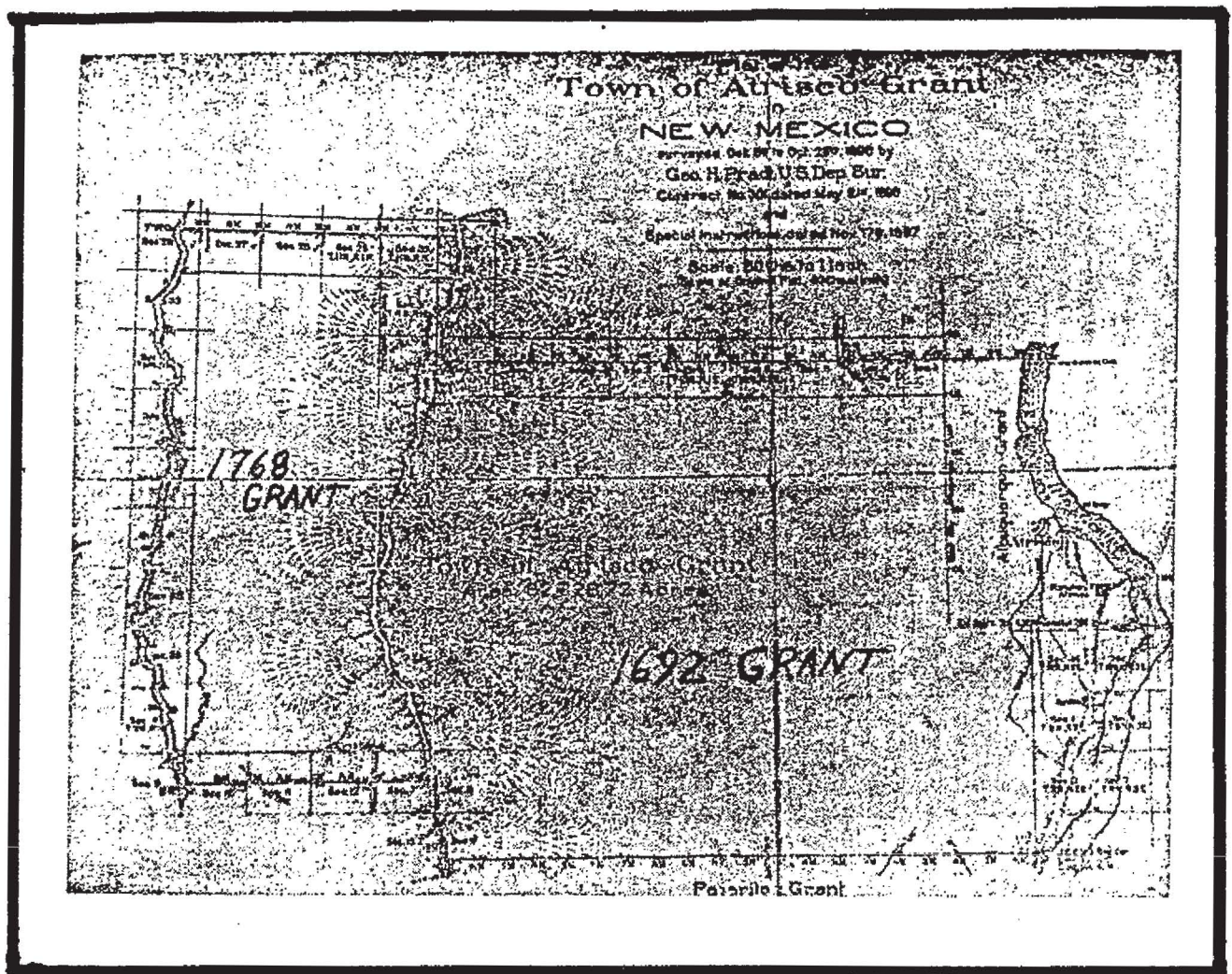


FIGURE 16. Plat for Town of Atrisco Grant. Taken from Metzgar, 1977.

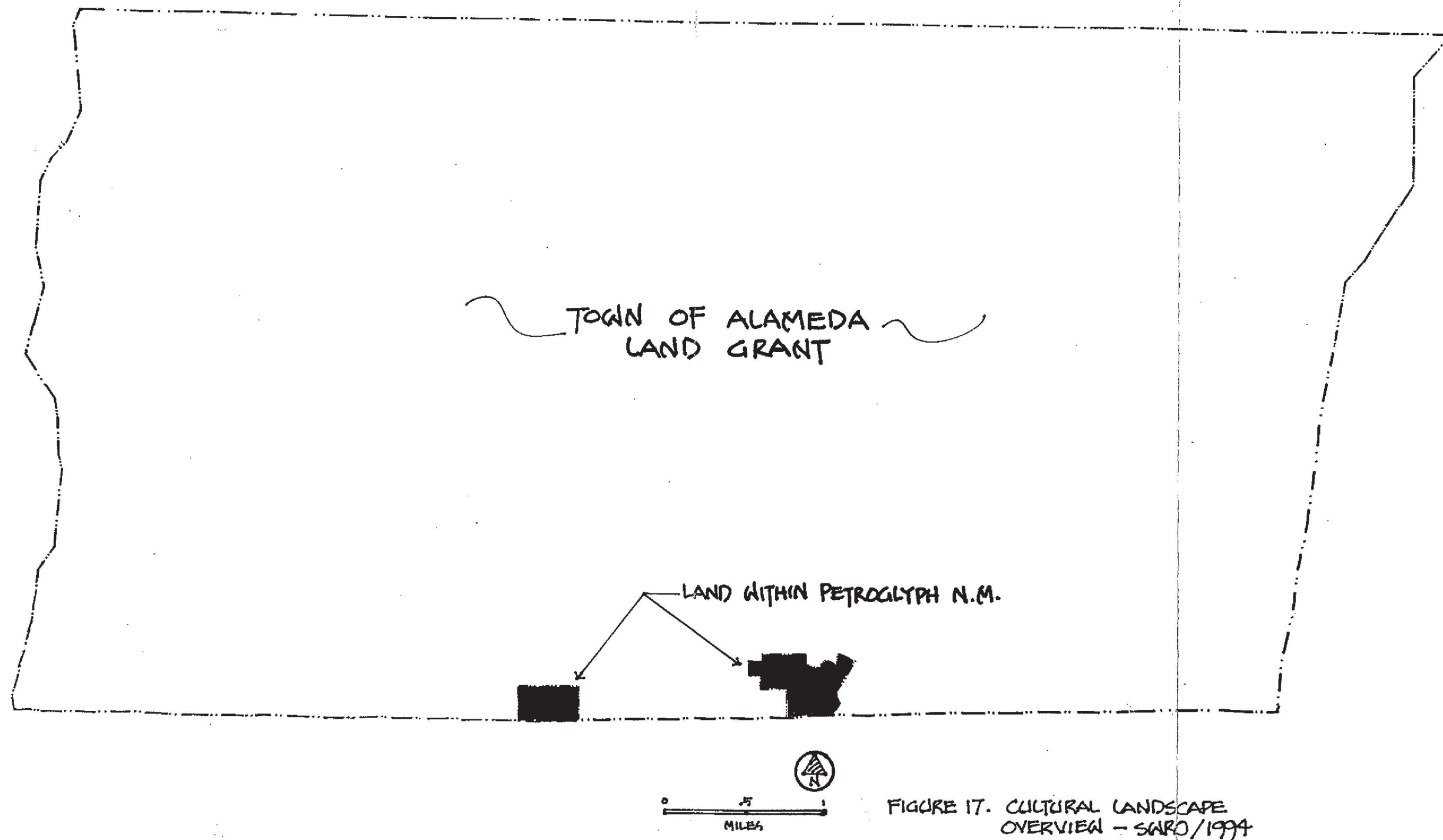


FIGURE 17. CULTURAL LANDSCAPE
OVERVIEW - SWFO/1994

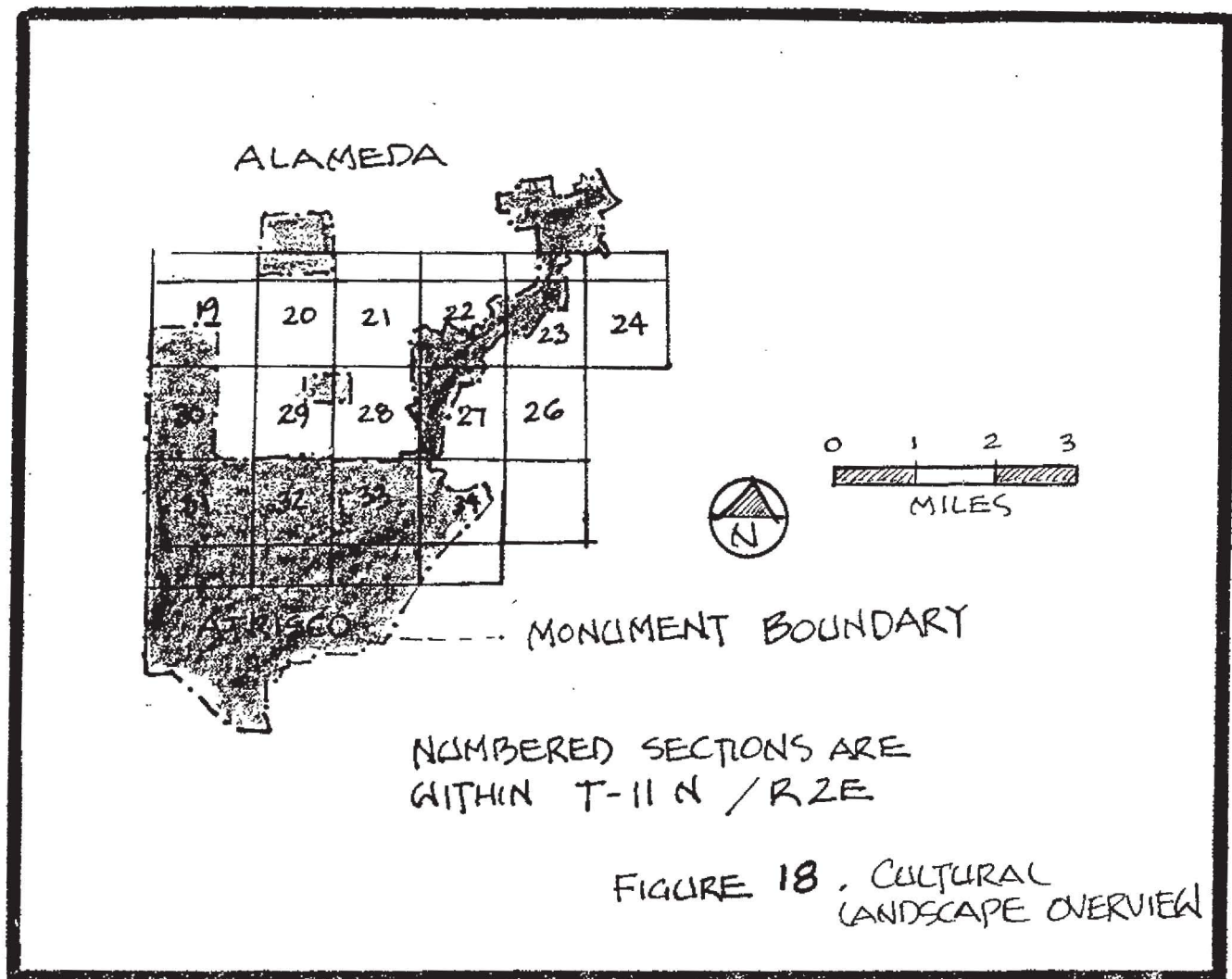


FIGURE 18 . Map showing land tracts (township/block/section).

As with the prehistoric cultural landscape, the historic cultural landscape is a conglomerate of fragments from various component landscapes, including the Atrisco Grant, the Alameda Grant, Volcano Ranch, and Albuquerque's urban open-space lands. Although the Volcano Ranch has been evaluated and determined to have minimal significance and integrity with regard to the National Register,³⁸ the other component landscapes are evaluated and assessed by this study for potential significance and resource integrity.

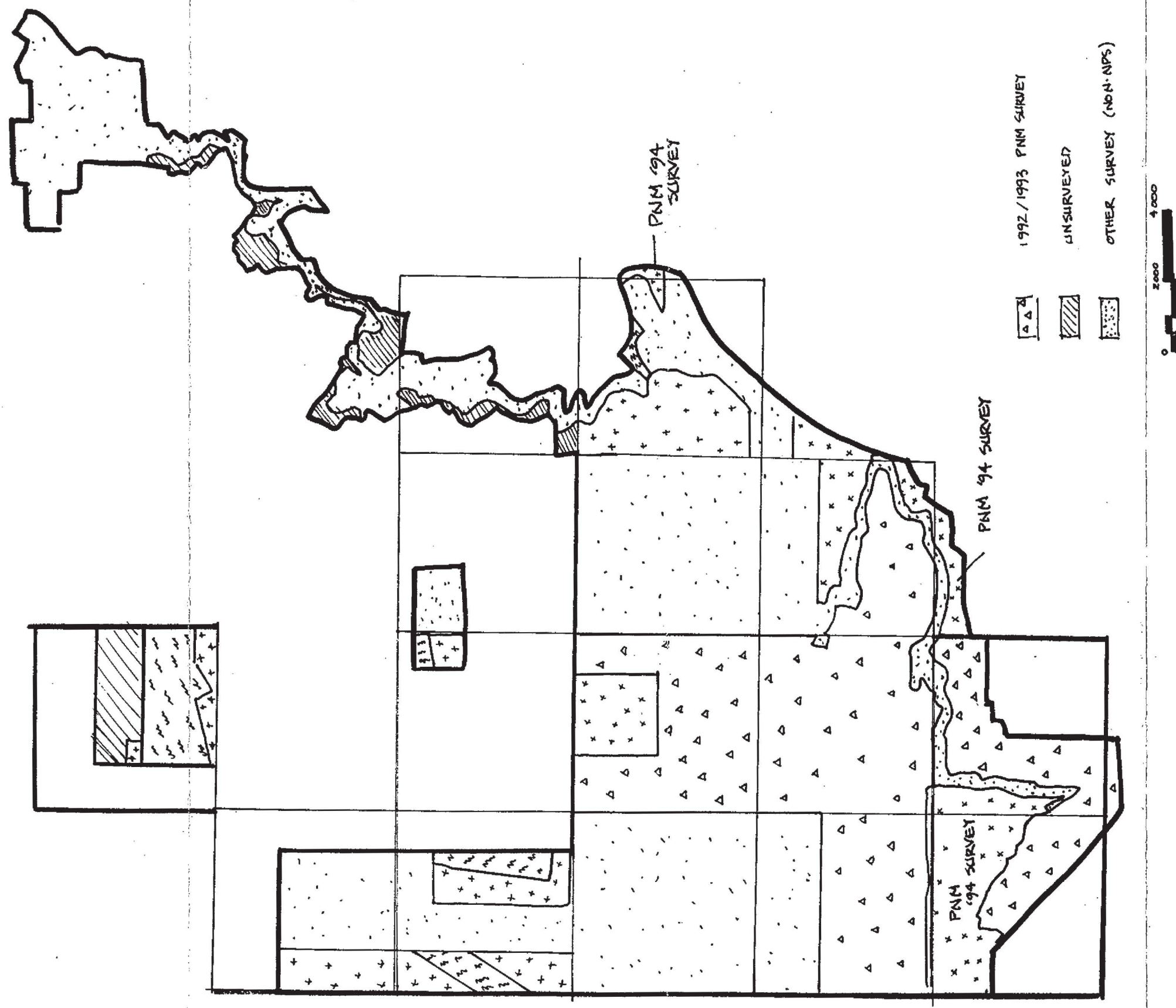
Contemporary boundaries (1944-present) have been established with the creation of the various state and city park and open-space areas, and the majority of these areas are defined by fence lines, which range from standard post-and-wire to 7-foot chain-link fencing. In addition to the enclosures that define areas such as Boca Negra Park, Petroglyph State Park, and Volcano Park, the park boundary is being delineated using wood post-and-rail fences, concrete block walls adjacent to residential developments, and boundary signage that identifies the land as being within the park. These visual boundaries were deemed necessary to officially identify the park lands within their fast-encroaching urban setting. Residential and associated urban development is quickly enclosing the boundaries of the park, and the perimeter will soon be encircled by major transportation thoroughfares, including Unser Boulevard to the south and east, Paseo del Norte to the north, and Paseo de Vulcan along the west.

Boundaries were undoubtedly a character-defining feature for the prehistoric and historic cultural landscapes, even though we are not capable of identifying just where or what those boundaries were during the prehistoric period. The historic period landscape boundaries are considered significant because they delineate the various use areas located within the park, and they reflect social, political, economical, and environmental conditions and beliefs for the various historic periods.

Archeological Resources

Numerous archeological studies of the West Mesa have revealed evidence of human occupation dating from the Paleo-Indian period and continuing to the contemporary uses of today. Intensive investigation in the area that encompasses the park today began in the 1960s with Theodore Reinhart's excavation of Boca Negra cave on the Bond volcano. He found that the cave had been used by many people through time, beginning in the Archaic period and continuing through the Pueblo IV period. Since then, there has been a series of surveys of the park, ending with the current survey, which has only one season remaining (figure 19). The park has been almost entirely surveyed, but the quality of the past studies is inconsistent. One survey had crews of two people who walked up to 200 feet

³⁸ Rodgers, James B. The Volcano Ranch Historic Site of the Llano de Albuquerque, New Mexico. March 1981.



ARCHEOLOGICAL SURVEY
— RESEARCH TRACTS —
FIGURE 19. Cultural Landscape Overview

apart,³⁹ while the current National Archeological Sites Inventory has crews of up to four people who walk an average of 15 meters apart. This variation may necessitate the re-investigation of certain areas before they are developed.

Although no one person has been able to study the park in its entirety, there have been attempts to synthesize existing data on the park. The best example is Matthew Schmader's report, completed in 1987. He outlines the physiographic zones of the park, and assigns site types to them. Unfortunately, Mr. Schmader's work has not yet been expanded to include any of the recent survey, which has covered a large portion of the park never before studied. Because this survey is not yet complete, nothing has been written conclusively on the findings. However, based on the site locations available and on Schmader's report, it is possible to identify some general trends. (Note: A composite map showing all located archeological sites and coded by site type and cultural affiliation has been prepared, and is on file at the park; however, due to the sensitive nature of this information, it is not included here).

The area around the volcanoes at the west end of the park has site types ranging from Paleo-Indian to Historic, with historic sites dominating. These sites include corrals used for sheep herding, Boca Negra cave, and a limited number of petroglyphs. On the mesa top, moving to the east, activity was focused around drainages. Many of these sites have not yet been dated--but again, the time span ranges from Paleo-Indian to contemporary. Often, the sites are only classified broadly: they are called Anasazi, if ceramics were present; and prehistoric, if there was no diagnostic material. This area also contains military sites, usually bombs dropped for practice during World War II. To the north, the geologic windows were ideal for corrals because of the protection they provided, and prehistoric and historic petroglyphs are both present there. To the south, the gravel ridges are almost one long, dispersed site, representing their use as a collection and production area for stone tools. Moving east, to the top of the volcanic escarpment, there are agricultural features around drainages, and long rock alignments on the rim to control soil and water flow. This top area also holds shrines, rock cairns, and small rock circles--especially on peninsulas.

The volcanic escarpment itself is probably the best studied part of the park, because most of the petroglyphs in the park are located on it. Most of the petroglyphs are thought to have been made between A.D. 1350-1680, in what is called the Rio Grande style.⁴⁰ However, there are petroglyphs that probably date to Archaic times, as well as historic petroglyphs. The greatest concentration of petroglyphs occurs in Piedras Marcadas canyon, at the north end of the escarpment, but the petroglyphs continue along the entire 17 miles of the volcanic formation.

³⁹ Whitmore, 1978.

⁴⁰ Schaafsma, 1987.

In addition to holding petroglyphs, the escarpment holds agricultural terraces--the largest of which are at Mesa Prieta, at the south end of the park. Over the years, these naturally formed terraces have accumulated substantial deposits of soils and sands, thereby rendering them capable of sustaining a variety of plant life and making them desirable locations for cultivation. The solar orientation of these terraces also allowed for extended growing seasons, because crops could be planted earlier and harvested later as a result of the heat-absorption qualities of the black lava flows surrounding them. They are also well protected from the wind, and were used for corrals in later times. Very old petroglyphs located on the rocks below mark these places. There are corrals at the base of the escarpment as well. Grinding slicks are also found on the escarpment, often in association with petroglyphs. These may have been used either for processing vegetation for food or for ceremonial purposes--or both.

The park does not extend into the floodplain below the escarpment, except in one location, which is isolated from the rest of the park: Piedras Marcadas ruin (LA 290) is a Pueblo IV site on the Rio Grande. This pueblo was occupied from A.D. 1100-1650, most heavily between A.D. 1300 and 1600, and was recorded during Coronado's expedition. There are probably ties between this site and the sites in the rest of the park that date to the same period. There have been several amateur excavations of the site, but most notes relating to them are lost. The Manns, who owned the property until the city acquired it, built their house over it, and did some exploration of their own.

Cultural Traditions

It might be stated that cultural traditions provide the cultural landscape with a majority of its character-defining features. The use of native resources, including stone, earth, minerals, flora, and fauna, was dictated by specific cultural traditions. Many cultural traditions continue to be practiced today within park lands by various contemporary groups who have had a historical association with the West Mesa landscape.

Some of the landscape features identified within the park boundaries reflect cultural tradition. These features include stacked stone corrals and rock alignments, shrines and descansos, petroglyphs and grinding slicks found on the lava boulders, and patterns of landownership and division. Other traditional features that were ephemeral in nature and are no longer represented in the landscape might have included shepherd camps with temporary shelter structures and brush pens, or chiceros.

Small-scale Features

There are numerous small-scale features within the boundaries of Petroglyph National Monument; however, it should be noted that not all of these features are considered to be character-defining with

regard to the cultural landscape. Some of the small-scale features that are evident within the landscape include rock alignments, stone corrals, petroglyphs, stone diversion dams, and bombing targets. The vast majority of these landscape features are characterized by their inconspicuous nature. These small-scale features are representative of the continuum of use that has occurred within the landscape from B.C. up to the present day. Although there are various types of cultural landscape resources identified within the park boundaries, there are minimal features that have been identified as essential to those landscapes. It might be said that the Petroglyph landscape is characterized by somewhat ephemeral features.

The tables on the next two pages identify the landscape-related features associated with the park. The features are identified on the basis of their associated landscape components and whether or not they have been determined to be character defining. The identified features are also included on the site base map showing existing conditions.

PREHISTORIC VERNACULAR LANDSCAPE (12,000-6,500 B.C.):

FEATURES	CHARACTER- DEFINING (Y/N)	INTEGRITY ASSESSMENT (P, G, or H)
playa lakes	yes	poor
gravel terraces	yes	good
surrounding landforms	yes	high
vegetation/plant assemblages (as are present today)	no	poor

PREHISTORIC VERNACULAR LANDSCAPE (6,500 B.C.-1540 A.D.):

FEATURES	CHARACTER- DEFINING (Y/N)	INTEGRITY ASSESSMENT
petroglyphs	yes	poor to high
grassland vegetation	yes	good to high
rock alignments/fire rings	yes	good
agricultural terraces	yes	good
diversion dams	yes	poor to good
open/undeveloped expanses	yes	poor to good
night sky/constellations	yes	poor to good

HISTORIC VERNACULAR LANDSCAPE (Associated with the Atrisco Land Grant 1692-1944):

FEATURES	CHARACTER- DEFINING (Y/N)	INTEGRITY ASSESSMENT
stone sheep corrals/pens	yes	poor to good
petroglyphs	yes	good to high
descansos and shrines	yes	good
boundary alignments/markers	yes	poor to good
ceremonial use areas	yes	good
trash disposal areas	yes	good
shepherd camp sites	yes	poor to good
grassland vegetation	yes	good
night sky/constellations	yes	poor to good
yerbas del campo	yes	good

HISTORIC DESIGNED LANDSCAPE (Associated with the City of Albuquerque and open-space lands 1710-1944):

FEATURES	CHARACTER-DEFINING (Y/N)	INTEGRITY ASSESSMENT
boundary alignments	yes	poor to good
fence alignments (that follow historic boundary alignments)	yes	poor to good
fence alignments (in general)	no	good to high
mining quarries and pits	yes	good
acequia and associated stock tank	yes	poor
wood post stock (cattle) corral	yes	good
military bombing targets	yes	poor
open/undeveloped expanses	yes	good

NOTE: The majority of landscape features identified within park boundaries have been determined to be character-defining to one or more of the various types of cultural landscapes associated with the park. Until a preservation treatment and management philosophy has been determined for the park's cultural landscape resources, these features should be preserved in place. Any proposed changes or impacts to these resources should be reviewed, and appropriate mitigation measures developed.

Land Uses/Activities

Prehistoric Period (12,000 B.C.-A.D. 1540): During the prehistoric periods, land-use activities were quite varied, and ranged from hunting-and-gathering subsistence-related activities to resource extraction for trade and ceremonial or religious functions. During the Paleo-Indian and Archaic periods, the hunting of megafauna was supplemented by the gathering of available floral and mineral resources. With the transition from the Archaic period to the early Basketmaker period came an increased dependence on and use of native flora, as well as cultigens obtained through trade networks with Mexico and other adjacent cultural regions. Permanent settlements were also being established during this transitional phase of cultural development.

Possibly as early as 1800 B.C., desirable crops were being cultivated and harvested from the natural terraces found along the escarpment. Throughout the Basketmaker and Pueblo periods, which ranged from circa A.D. 1 to 1540, agricultural and settlement

patterns continued to evolve and develop. The Pueblo periods are characterized by the development of multi-storied villages, usually built near permanent water sources such as rivers or natural seeps and springs. It is during the Pueblo periods (1350-1540) that the majority of the petroglyphs were created and Piedras Marcadas Pueblo was thriving. The river-terrace and floodplain lands surrounding the site of this pueblo were undoubtedly developed for agricultural purposes during the occupation of the site; however, there is no readily visible evidence to confirm this. It is possible that the areas along the escarpment and on the mesa top that were developed for agricultural use continued to be utilized through the Pueblo period.

The land-use activities noted during the Proto-historic period (1540-1598) were much the same as those noted above for the later prehistoric period. These activities included the development of habitation sites; the establishment of religious and ceremonial areas; the cultivation of agricultural areas, including lands adjacent to the Rio Grande and on the escarpment terraces; the collection of various natural resource material; and the continued development of circulation routes to enable movement through the landscape and to facilitate trade with surrounding areas.

Historic Period (A.D. 1540-1944): Land-use activities in the Middle Rio Grande Valley began to change as the area was explored and settled by the Spanish in the mid-16th century. The introduction of stock animals resulted in the open grassland areas being utilized for pasturage. Hunting and agricultural uses continued throughout the area, with irrigated agricultural fields aligning the rich and fertile river bottomlands. Religious and ceremonial uses within the Petroglyph National Monument area continued with the Pueblo tribes, and special areas were also designated and used by neighboring Hispanic families.

Sheep grazing on the mesa and along the escarpment resulted in the construction of numerous sheep pens and corrals, as well as the development of shepherd camps. While tending flocks in isolated and remote areas such as the West Mesa, shepherds lived lives of self-sufficiency. Native materials were used for building and construction needs, and native plant species were used for nutritional and medicinal applications for both the shepherd and his herds.

Additional uses of lands within the park included the establishment of airline flight paths over the mesa top; the development of utility rights-of-way and public easements; and the establishment of water reservoirs/tanks, for the City of Albuquerque.

Sheep grazing was the primary land use in the West Mesa area until the early 20th century. Mining and quarrying activities were undertaken in the early 20th century, and focused on the gravel and cinder products that could easily be extracted from the volcanoes area. Military-related activities were first introduced to the area in 1919 with the National Guard's development of a shooting/target range south of Rinconada; and in 1941, over 15,000 acres

of West Mesa land were leased for the development of a bombing range.

In the 1950s, wells were excavated along the mesa top, and private ranches were developed. The Volcano Ranch included lands now within the park boundaries, and cattle were grazed across the mesa. Throughout the late 19th century and continuing to the present day, in addition to the uses mentioned above, the lands within Petroglyph National Monument have been utilized for picnicking and recreation.

Contemporary Period (A.D. 1945-1994): The grazing of sheep and cattle continued in the West Mesa area during this period, although the number of sheep drastically declined in the mid to late 1930s. Cattle are still grazed on the Atrisco grant lands--now known as the Westland Development Corporation lands--adjacent to the park. Mining operations also continued into the mid to late 20th century, and included explorations for geothermal energy in and around the volcanic cones. Local residents interviewed during the Rapid Ethnographic Assessment mentioned that the mesa top was an ideal area for quail hunting.

Because of the remote nature of many areas within the park and their close proximity to the city, the illegal dumping of trash and other debris has been a continuous problem, which the park and surrounding neighborhoods have had to work diligently to eliminate.

With regard to recreational activities, the land within and immediately adjacent to the park is presently used by model-plane and radio-controlled-car enthusiasts, bicyclists, equestrian groups, nature watchers, and others. A motocross track was established on the mesa top east of the volcanoes; however, no date has yet been established for its use and subsequent abandonment.

According to local informants and information provided in the Rapid Ethnographic Assessment, there are many areas within the park that are still used by American Indian groups, and possibly Hispanic groups, for religious and ceremonial purposes. For example, a contemporary wooden cross was recently located within the park boundaries. A few of these religious and ceremonial areas have been identified, but there are probably many more that will remain unknown until an extensive ethnographic study is undertaken. For this reason, a preservation approach is encouraged with regard to the park's landscape resources.

Structures

The structures found within the boundaries of Petroglyph National Monument include 1970s park facilities; private residences dating from the 1950s and 1960s; and pueblo ruins dating from circa 1300.

There are four former residences and one life estate residential complex located within the park boundaries; however, none of these structures have been determined to be historically significant.

Two of the structures have been remodeled by the National Park Service: One now provides office and visitor center facilities; and the other will serve as office space for the park's Ranger Activities division. Two vacant residences and their associated structures are proposed for future removal.

Although naturally occurring rock shelters and overhangs are not routinely included as structures, this report includes them under this discussion as "natural" structures. There are several of these structures located within the park boundaries, and the majority of them are only large enough to accommodate one or two people. Several of these structures have petroglyph panels in close association, many of which depict double crosses or symbols that appear to be of historic origin. A systematic approach to recording the locations of these structures and associated features such as corrals and petroglyphs has not been undertaken as yet but would be included as part of a Cultural Landscape Report for park lands.

The structural remains of the Piedras Marcadas Pueblo are buried beneath rubble and years of accumulated deposits, leaving them virtually impossible to define without excavation. For this reason, they are considered archeological ruins and will not be described in this discussion of structures found within the landscape at Petroglyph National Monument.

Several historically significant structures that have been identified within park boundaries include fences, corrals, stock tanks, and other small-scale structures. However, because of the small-scale nature of these features, they are discussed in a previous section of this report focused on small-scale elements within the landscape.

A few structural ruins have been noted by archeologists working within park boundaries, and these include remnants of a building foundation in Rinconada Canyon and a circa-1940 cement stock-tank base in the Westland area. As is the case with the remains of the Piedras Marcadas, these are considered archeological resources and should be managed accordingly. However, as is the case with archeological sites, their locations and any land-use information related to them should be included in the comprehensive landscape analysis.

Other structures found within park lands consist of contemporary developments such as those found at Petroglyph State Park and Boca Negra Park. The state park includes numerous shaded picnic shelters, a restroom building, and a visitor contact station.

STATEMENT OF SIGNIFICANCE

Introduction

The lands included within the boundaries of Petroglyph National Monument represent a conglomerate of several types of cultural landscape resources, none of which are present in their entirety.

The potentially significant cultural landscapes that have been identified during the course of this overview study include:

1. Prehistoric-vernacular-component⁴⁰ landscape, representing the time period from 12,000 B.C. to 6,500 B.C.
2. Historic-vernacular-component landscape, representing the Atrisco Land Grant and its continuum of use by the descendants of the original grantees. The time period associated with this landscape ranges from A.D. 1692 to 1944.
3. Historic-designed-component landscape, representing land-use practices within the open-space lands associated with the City of Albuquerque. The time period associated with this landscape ranges from A.D. 1710 to 1944.
4. Ethnographic landscape, representing the contemporary traditional land-use practices of Pueblo and Hispanic groups maintaining an association with the West Mesa area.

Each of these identified landscape types is discussed below with regard to their significance and applicable National Register Criteria as defined in National Register Bulletin 15.

Based upon the preliminary findings of this study, it has been determined that although the archeological resources associated with the Paleo-Indian and Archaic periods are significant, and the overall landscape of the Middle Rio Grande valley as seen through its association with this early period is potentially significant, the landscape resources associated with these early periods are not well represented within park lands, and have minimal significance with regard to National Register criteria. It is the opinion of this author that additional information is needed to determine the significance and evaluate the integrity of this early landscape with regard to its potential for eligibility for inclusion in the National Register of Historic Places. Although some of the landscape's character-defining features remain, they have been severely altered by time and natural processes. Examples would be

⁴⁰ Component cultural landscapes have been defined by the NPS service-wide Cultural Landscape Inventory Program as "a landscape unit which contributes to the significance of a landscape and itself can be further subdivided into individual features. The Component Landscape may contribute to the significance of a National Register property or, in some cases, be individually eligible for the National Register of Historic Places."

the burial of the once-exposed gravel terraces and the extinction of the playa lakes. The overall appearance of the landscape and its vegetative cover has also changed considerably, and due to the dramatic climatic changes that have occurred over the past several thousand years, rehabilitation or restoration would not be feasible.

The time period for the prehistoric-vernacular landscape has been established as ranging from circa 6,500 B.C. to A.D. 1540. The beginning date of 6,500 B.C. has been recommended based on studies of fluctuations in Post-Pleistocene moisture levels⁴¹ and subsequent changes in environmental conditions, as well as cultural development. A period of decreased moisture levels began around 8,600 B.C., and by 6,500 B.C., environmental conditions were similar to the present. The cut-off date of 1540 represents the end of the prehistoric period and the beginning of the European Contact period, when Coronado and his troops entered the Rio Grande Valley and began to officially record their experiences in the area.

Although this landscape comprises the whole of the Middle Rio Grande Valley, only a portion is included within park boundaries. The area that lies within the park has been identified as a component landscape that is closely associated with the larger landscape defined by the river valley and its drainages. The component landscape designation is based on the fact that the landscape resources found within the West Mesa area are unique and significant because this area was specifically identified and utilized by various indigenous people for events and practices that reflect their cultural traditions. These events and practices are reflected in the thousands of petroglyphs carved into the basaltic boulders along the escarpment.

The prehistoric landscape associated with Petroglyph National Monument is recommended for national significance under National Register Criteria A and D. Criterion A applies to properties associated with events that have made significant contributions to the broad patterns of history, including, but not limited to, exploration, settlement, farming, and ranching. Criterion D applies to properties that have yielded, or are likely to yield, information important to history or prehistory. Surface or subsurface remains may provide information about agricultural land uses, settlement patterns, or ceremonial traditions.⁴²

The historic-vernacular component landscape associated with the Atrisco Land Grant is significant when examined in context with the entire land grant and its land-use history and development. The West Mesa lands were defined as a separate functional area by the

⁴¹ Tainter, Joseph A. and Frances Levine. Cultural Resources Overview: Central New Mexico. USDA Forest Service and Bureau of Land Management. 1987. P. 13.

⁴² USDI-NPS. National Register Bulletin No. 15. "How to Apply the National Register Criteria for Evaluation." 1991.

Atrisco heirs, and served as common grazing lands for the associated families. As a component landscape, the area contributes to the overall significance of the Atrisco grant lands. The Atrisco landscape is recommended for national significance under National Register Criteria A, D, and possibly B. The application of criteria A and D is defined above. Criterion B applies to properties associated with individuals whose specific contributions to history can be identified and documented. Bulletin 15 notes that this criterion is generally restricted to those properties that illustrate (rather than commemorate) a person's important achievements.⁴³

The association of this landscape with the Duran y Chavez family and other Spanish Colonial families needs to be explored further, because these families played a significant role in the colonization and development of the New Mexico territory.⁴⁴

The historic-designed component landscape associated with Petroglyph National Monument represents a continuum of change in land use with regard to urban open-space lands. The time period associated with this landscape ranges from 1710 (the date of establishment for the City of Albuquerque) to 1944. The ending date for this time period was established using the National Register cut-off of a 50-year minimum for historic properties. Ideally, this landscape will be researched and analyzed for its continuum of use to the present day.

Again, like the others that have been identified within the park boundaries, this landscape is only part of a larger landscape whole that would include (for the purposes of research and analysis) all of the urban open-space lands associated with the City of Albuquerque. The area of the West Mesa has been identified as a historic-designed-component landscape that is significant for its ability to reflect the multi-cultural development of urban open-space lands. The patterns of landownership are representative of Spanish, Mexican, and American land-division practices, and may be thought of as the initial design concept for future land development. Design decisions for land use and development are dependent on ownership boundaries, as well as on social, economic, and political conditions. The West Mesa landscape should provide the researcher with a wealth of information outlining the changes in land-use and land ethics that have occurred in New Mexico over the past 280 years or so.

The historic-designed component landscape at Petroglyph National Monument is recommended for state significance under National Register Criteria A, D, and possibly C. However, further study may determine that this landscape meets the criteria for national significance. The application of criteria A and D is defined

⁴³ Ibid., p.14.

⁴⁴ Chavez, Fray Angelico. *Origins of New Mexico Families: A Genealogy of the Spanish Colonial Period*. Museum of New Mexico Press, Santa Fe. Pp. 19-23.

above. Criterion C applies to properties significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork. To be eligible under Criterion C, a property must meet at least one of the following requirements:

1. Embodies distinctive characteristics of a type, period, or method of construction;
2. Represents the work of a master;
3. Possesses high artistic value; or
4. Represents a significant and distinguishable entity whose components may lack individual distinction.

It is suggested that through its physical design and layout, the historic-designed-component landscape embodies distinctive characteristics of land-use planning and design that are characteristic of the Spanish Colonial, Mexican Territory, and American periods.

This landscape is significant for its research potential, because as a case study area, it will allow us to identify and develop a better understanding of the social, political, and economic processes that created the New Mexico frontier, territory, and state.

The significance and value placed on the ethnographic landscape need to be defined by the various contemporary groups who have maintained traditional associations and uses of this landscape. A thorough ethnographic study should include inquiries related to the landscape and the contemporary needs of its traditional user groups.

RESOURCE INTEGRITY

Introduction

The integrity of a cultural landscape is evaluated by comparing the existing physical characteristics of the landscape resource to those of a historic period. "Integrity refers to the authenticity of the historic identity of a cultural resource, which is evidenced by the survival of physical characteristics from a historic period⁴⁵."

⁴⁵ Firth, Ian. 1985. Biotic Cultural Resources: Management Considerations for Historic Districts in the National Park System, Southeast Region. USDI, NPS Research/Resources Management Report SER-82.

The National Register of Historic Places has established seven criteria that can be used to assess the integrity of cultural resources: location, design, setting, materials, workmanship, feeling, and association. Firth has adapted these criteria so they may be used to evaluate biotic cultural resources.⁴⁶ His modified criteria replace design, materials, and workmanship with community organization, species composition, and management techniques.

The integrity of the various landscapes that comprise Petroglyph National Monument has been assessed using all of the above criteria and analyzing the various landscape features in context with their associated landscapes. Generally, features that were found to be significant as part of the historic design and land use were identified as character defining; and those features that had retained their original qualities of function or design were determined to have integrity. Using this evaluation, the integrity of the various types of landscapes that comprise Petroglyph National Monument has been determined. The ethnographic landscape is not included in this evaluation of resource integrity, pending a thorough ethnographic study of park lands and the contemporary user groups who are traditionally associated with these lands.

The following discussion summarizes the evaluation of the resource using each of the criteria that have been determined to significantly contribute to the integrity of the park landscapes.

Discussion of Integrity of Prehistoric Landscape Resources

As discussed earlier in this report, the prehistoric period has been roughly divided into two "landscape periods" that reflect environmental, as well as cultural, changes to the landscape as a whole. This division facilitates the analysis process--particularly when addressing landscape integrity. The findings regarding the integrity of the two prehistoric periods are presented in the following discussion.

Prehistoric-vernacular-component Landscape (12,000 B.C.-6,500 B.C.):

Location: The location of the early prehistoric landscape and its associated character-defining features has not been changed or altered, and may therefore contribute to the overall integrity of the cultural landscape.

However, it should be noted that the locations of many of the use areas associated with this early landscape have been lost through erosion and site deflation, loss of locational features through time, and inadequate knowledge of cultural processes that characterized the Paleo-Indian and Archaic periods of site development.

⁴⁶ Ibid.

Setting: The setting associated with the early prehistoric cultural landscape has been identified as the entire Middle Rio Grande Valley. The component landscape for this period has been identified as including the West Mesa and its associated escarpment. The activities that created this cultural landscape were unique to the resources available within this specific area.

Although a comprehensive assessment of the larger setting that comprises the entire Middle Rio Grande Valley would be ideal, the scope of this study and the limited research time have required the focus of this assessment to concentrate on the setting for the smaller component landscape. The larger setting is researched and evaluated to provide context to the smaller area.

The component landscape as identified above includes the West Mesa and its associated volcanoes and escarpment, as well as the expansive views and overall visual quality of the surrounding area. As the significant natural landforms and features remain intact within and outside of the component landscape, the setting has been determined to contribute to the integrity of the component landscape.

Design: Little is known regarding site development, design, and layout for the Paleo-Indian and early Archaic cultural periods. The design undoubtedly reflected the functional needs of the people, and was centered around available resources. Although esthetics and/or other values may have played a role in determining site design and layout, information to support this is not available.

The criterion for landscape design does not contribute to the integrity of the early prehistoric component landscape associated with Petroglyph National Monument.

Workmanship: The workmanship of features and character-defining elements within the early prehistoric component landscape is not readily evident. Few, if any, extant features (rock alignments, corrals, etc.) within this landscape have been identified as having direct association with this early time period.

The criterion of workmanship does not contribute to the overall integrity of the early prehistoric component landscape associated with Petroglyph National Monument.

Materials: As with workmanship, the materials utilized by the site's first inhabitants are not readily represented on site, and are therefore difficult to discuss and evaluate. Although some materials may be identified through archeological research, the majority of them will be limited to the most durable materials, such as lithics, minerals, and possibly pollens and phytoliths.

The criterion of materials does not contribute to the overall integrity of the early prehistoric component landscape.

Feeling: Although the author does not presume to try and identify the significant feelings that were experienced by the area's first inhabitants, it should be noted that there are certain human experiences, primarily sensory in nature, that have remained the same through the years. Without placing values on whether these sensory feelings are desirable or undesirable, experiences such as sights, sounds, smells, and touch are addressed under this criterion.

Although there is definitely a wide array of newly introduced sights, sounds, and smells for today's visitor to this landscape to experience, there are also many sensory experiences that today's visitor might share with the site's earliest inhabitants. These include the feel of the grit-laden winds howling across the mesa top; and the sight of a red-tailed hawk hovering overhead in search of prey, and the sounds of its chattering cries as it signals the human figures below to move away from its hunting grounds. Regardless of cultural affiliation, the sound of low rustling in the scrubby groundcover usually elicits a response from most humans (especially in rattlesnake country). The response in some may be to jump and run, while others may choose to investigate and seek out the source of the noise. Be it good or bad, visitors have the potential for an experience with the land and its varied resources that might easily have been experienced by someone from the Paleo-Indian or Archaic cultural period.

Because a potential for varied visitor experiences and feelings exists within this landscape that may reflect experiences and feelings shared by the first inhabitants of the area, this criterion contributes to the overall integrity of the early prehistoric component landscape associated with Petroglyph National Monument.

Association: The surrounding Middle Rio Grande Valley is the primary association for this component landscape. Additional contextual research for this area should be conducted to further identify direct associations between the two.

Other associations for this early time period of site development and use have not been identified at the present time, but further archeological research may be able to provide some clues.

Because of the lack of available information regarding associations, this criterion does not contribute to the overall integrity of this component landscape.

Plant-community Organization: The plant-community organization that characterized the early prehistoric landscape associated with Petroglyph National Monument has undoubtedly undergone innumerable changes over the past several thousand years. As soils have accumulated over the lava flows and along the escarpment, hydrologic changes have occurred and effected subsequent changes in vegetative patterns across the site. Temperature and moisture fluctuations have also occurred in this area, and as the temperature and aridity increased, entire plant communities were lost.

Studies have shown that sometime around 6,500 B.C., the establishment of plant communities that are now considered characteristic of the landscape of the Middle Rio Grande area began to develop. The plant communities prior to this time reflected adaptation to a moister and cooler environment.

Because of the potentially radical change in plant-community organization that occurred at the end of this cultural period (6,500 B.C.), it has been determined that this criterion does not contribute to the integrity of the early prehistoric component landscape.

Species Composition: No information regarding the characteristic plant species associated with this early prehistoric landscape has been located at the present time. Future archeological research, coordinated with paleobotanical, palynological, and phytological studies, has potential for providing additional information regarding this subject.

At this time, the criterion of species composition does not contribute to the integrity of this component landscape.

Management Techniques: Little information is available regarding prehistoric land management techniques, particularly from the Paleo-Indian and Archaic cultural periods. Additional research may provide information about this topic.

At this time, the criterion of management techniques does not contribute to the integrity of this component landscape.

Summary: Although there is national, regional, and local significance with regard to the early prehistoric landscape in the Middle Rio Grande region, it has been determined that the component of this resource that is included within the park only has integrity with regard to location, setting, and feeling. Integrity of these three criteria is not sufficient for National Register

eligibility. This early prehistoric component landscape located within the boundaries of Petroglyph National Monument has been determined to have minimal, if any, potential for National Register significance as a component landscape resource.

Prehistoric-vernacular-component Landscape (A.D. 6500-1540):

Location: The majority of the significant character-defining features associated with the prehistoric and historic landscapes remain in their original locations, and therefore contribute to the overall integrity of the cultural landscapes.

The locations of various use areas are being identified as part of an ongoing archeological survey being conducted by National Park Service staff from regional and park offices. The identified areas are delineated using site sketch maps; and, when possible, cultural affiliations are identified using any available diagnostic cultural materials.

Setting: The setting of the prehistoric-vernacular landscape associated with Petroglyph National Monument varies in both size and scope. Due to the migratory nature of the prehistoric cultural groups that utilized the landscape, the boundaries have been set to encompass the whole of the Middle Rio Grande Valley. The component landscape that includes the area identified within park boundaries could claim the Rio Grande Valley as its primary setting, while the setting for the larger valley landscape might extend west to the Zuni and Cebolleta Mountains; north to the Jemez and Sangre de Cristo Mountains; east to the Sandia, Manzano, and Manzanita Mountains; and south to the Magdalena and San Mateo Mountains.

For the purposes of this study, only the setting for the component landscape will be discussed, although the expansive views and overall visual quality of the surrounding area, with its prominent natural landforms, is significant to the landscape's ability to retain the feelings and associations experienced during its prehistoric past.

The natural landforms that surround this landscape and the plant communities within it provide some continuity between the prehistoric and modern settings. Although modern developments have gradually encroached upon the West Mesa area, there are still some areas within park boundaries that reflect the setting of earlier days. Even when some of the modern developments are visible, one can look out at the surrounding mountain ranges and river valleys and reflect upon how the landscape must have been

without all the highways, utility rights-of-way, and buildings.

Design: For the earlier part of this prehistoric period, the design of the prehistoric-vernacular-component landscape is relatively nondescript, because it reflected the functional needs of the various cultural groups actively utilizing the landscape and its associated resources. Esthetics and/or other values may have played a role in determining site design and layout, but without a written record this will never be known.

By the later part of this period (6500 B.C.-A.D. 1540), planned site design and layout were fairly uniform among the various pueblos. By the 1500s, local groups had designed and built numerous pueblos. There were relationships among house and storage units, kivas, plazas, etc. Room sizes, shapes, arrangements, and functions were remarkably similar, showing a construction. Also similar were the relationships among the huge apartment houses and small ancillary field houses, agricultural fields, and their locations relative to water sources, wood sources, etc.⁴⁷

The criterion of design has the potential to contribute to the overall integrity of this vernacular landscape, but more detailed research and documentation are needed to confirm this.

Workmanship: Little information is available regarding the workmanship of prehistoric features or structures within the landscape of the West Mesa area. The features that are available for examination reveal a crude building style that is characterized by simple stacking of the rough lava boulders that are found scattered throughout the landscape. Many of the features attributed to these early cultural periods include soil and diversion dams. These extant features represent only a single course of lava boulders with exacting placement to ensure that they functioned accordingly.

Although these features may not look like much to the average visitor, they convey a great deal to the landscape researcher, archeologist, or geomorphologist who is studying land use and development. The workmanship that went into the construction of these features appears to have been secondary to the feature's function. Placement and ability to accommodate the needs of the builder (through retention of either water or soil) was the primary focus. The fact that many of these features still exist is a good indicator that this seemingly simple

⁴⁷ Diane Rhodes, NPS/DSC, personal communication.

workmanship was really all that was required for the feature to perform its required task.

With regard to the structures that were characteristic of this period of landscape development, the Piedras Marcadas Pueblo undoubtedly represented the quality workmanship found in other area pueblos. The ruins of today would likely belie this fact, yet archeological investigation would most likely confirm it, because it has been hypothesized that the ruins still contain intact plaster walls with highly decorative murals much like those associated with other pueblos of the Rio Grande Valley.

The workmanship associated with the petroglyphs ranges from exacting and detailed to somewhat crude and poorly defined. The varying styles have been identified and assigned to different time periods of use during the prehistoric period.

Because of the existence of character-defining features that reveal various degrees of workmanship as a result of land-use and land management actions, the criterion of workmanship contributes to the overall integrity of this component landscape.

Materials: Again, as is the case with workmanship, the materials utilized during the prehistoric period are not readily identified other than through archeological means. The materials undoubtedly included locally available native resources such as stone, wood, and plant fibers and materials. Several rock alignments and stone rings that presumably date to the prehistoric period have been located within park boundaries. Locally available lava boulders were the chosen material for the construction of these features. Other structures and landscape-related features may have been constructed of organic materials such as wood and brush, but the ephemeral nature of these materials would have prevented their preservation.

Feeling: The feelings experienced by the prehistoric period inhabitants of this landscape are not readily identifiable, but certain human experiences are assumed to have remained the same through the years. These experiences would be purely sensory in nature, and although no values are placed on them as to whether they were desirable or undesirable, they have been identified, and include sights, smells, and sounds.

Many of the sensory experiences that were part of the prehistoric experience may influence today's park visitors as they move through the landscape. These experiences may include the sight of a full moon rising over the Sandia Mountains, the smell of a fresh spring rain, or the sound of the incessant wail of the buffeting winds blowing across the top of the mesa. Although there are some areas

within the park that may increase visitors' ability to understand and appreciate the sense of place afforded by this landscape, there is no recipe that will guarantee that these feelings will be experienced by all. Often times, it takes a combination of conditions, many of which are ephemeral, for an individual to have a memorable sensory experience.

Association: The prehistoric-vernacular-component landscape identified within Petroglyph National Monument is considered a component of the larger Middle Rio Grande Valley landscape. The interconnectedness of these landscape areas requires that the research and analysis of the former be closely associated with studies and assessments of the larger area.

The area encompassed by the Piedras Marcadas Pueblo is closely associated with several other pueblos located in the Middle Rio Grande area and covering an area from Isleta to the south to Bernalillo to the north. This association was quite significant to the development and protection of these settlements, and should be explored through further research.

Other associations with this component landscape include significant landforms such as the various surrounding mountain ranges, rivers, and valleys that were valued by the prehistoric inhabitants for religious and ceremonial purposes. It is assumed that many of these landforms were the same as those identified by several of the contemporary American Indian groups associated with the area today.

Plant-community Organization: The organization of plant communities within the prehistoric landscape has not been established at the present time; however, it is assumed that from sometime circa 6,500 B.C., plant communities similar to those that are present today were being established in this area.

According to some preliminary studies within the Petroglyph National Monument, it has been hypothesized that there continue to be remnant plant communities located in isolated niches along the escarpment that represent the area's earliest grasslands. These areas have been preserved as a result of their locations along the escarpment, which apparently discouraged grazing by the herds of sheep and cattle that roamed the West Mesa in search of pasturage.

Until new information is forthcoming, it is assumed that there are remnant plant communities within today's landscape that were characteristic of the communities found during this later prehistoric period. Additional research is needed to support or refute this statement.

At present, this criterion contributes to the overall integrity of this component landscape.

Species Composition: Archeological research has provided some information regarding the different plant species that were prehistorically associated with this landscape. Paleobotanical, palynological, and phytological studies should provide additional information regarding this subject.

This overview study did not investigate the available information at this level of detail. Additional work is needed here.

Until new information is forthcoming, it is assumed that there are numerous plant species found in today's landscape that were characteristic of the communities found during this later prehistoric period. Additional research is needed to support or refute this statement. At present, this criterion contributes to the overall integrity of this component landscape.

Management Techniques: Little information was located regarding prehistoric land management techniques, although land-use activities are discussed in detail. Extant features have been located and identified as soil and water diversion structures. The existence of features such as these reveal some management techniques that were being utilized during the site's prehistoric occupation. The use and development of the naturally occurring terraces found along the escarpment also provide clues as to management--but no answers.

The specifics, or even theories, for land management activities are not presently available; however, additional research may provide more information on this topic. With additional information, it may be determined that the criterion of management techniques will contribute to the overall integrity of this component landscape.

Summary: In summary, it has been determined that the prehistoric-vernacular-component landscape located within the boundaries of Petroglyph National Monument has retained its integrity--particularly in the areas of location, setting, workmanship, feeling, association, plant-community organization, and species composition.

A schematic map has been prepared to identify areas within this particular landscape that represent specific use areas or areas with significant character-defining features that are sensitive to change and should be preserved and managed accordingly (figure 20). The following recommendations will reference the areas shown on this map.

Discussion of Integrity of Historic Landscape Resources

The historic landscape resources within the park have been identified to include the following:

1. Historic-vernacular-component landscape, representing the Atrisco Land Grant (1692-1944);
2. Historic-designed-component landscape, representing land-use practices within the open space lands associated with the City of Albuquerque (1710-1944); and
3. Ethnographic landscape, representing the contemporary traditional land-use practices of Pueblo and Hispanic groups maintaining an association with the West Mesa area.

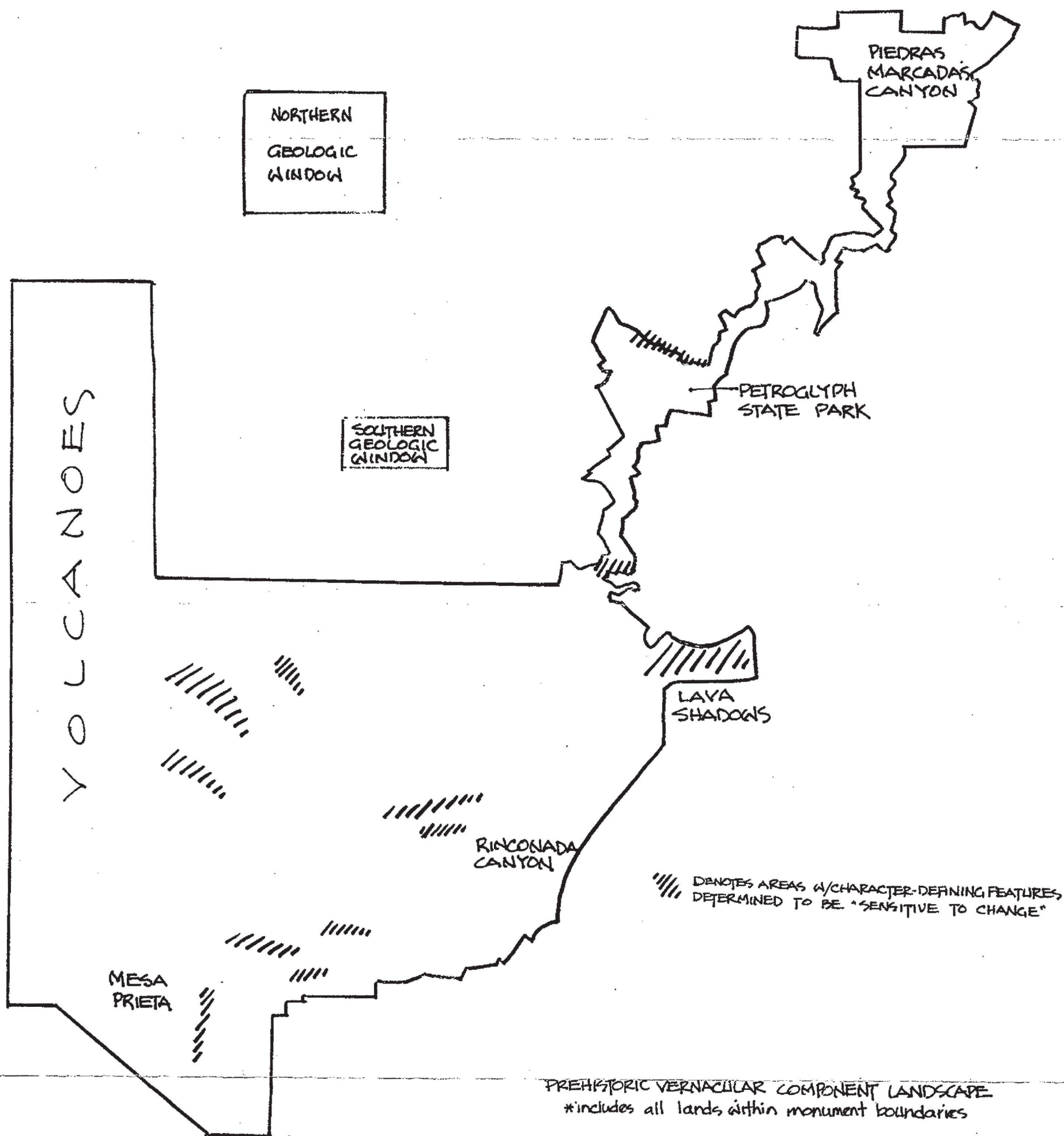
Each of these historic landscape resources, with the exception of the ethnographic landscape, has been analyzed separately, and assessed with regard to integrity as identified by existing National Register criteria. The findings regarding the integrity of both the historic-vernacular-component and historic-designed-component landscapes are presented in the following discussion.

Historic-vernacular-component Landscape (1692-1944):

Location: The historic-vernacular-component landscape and its associated character-defining features remain in their original locations. Although some ephemeral features have slowly weathered away, their locations may possibly be identifiable through archeological investigations or oral histories. The locations of various use areas within the historic-vernacular landscape is obvious to the keen observer, and may be interpreted for the interested park visitor.

Setting: The overall setting for the historic landscape resources associated with the Atrisco Land Grant has changed considerably with the encroachment of urban development surrounding this once relatively remote area. Although the lands immediately surrounding the West Mesa area are undergoing extensive development, the primary land forms that define the natural setting for the historic landscape remain intact. The grand scale of these landforms dwarfs the recently introduced man-made developments, and helps to minimize some of the potentially intrusive impacts that modern developments may have on the landscape resources.

Once visitors are actually within park lands, there are numerous areas where the smaller-scale setting is virtually the same as it was during the time that the lands were utilized by the Atrisqueños. Some exceptionally good areas for experiencing the undisturbed setting include the North and South Geologic Windows, areas within Rinconada



PETROGLYPH NATIONAL MONUMENT

0 1000 4000
500 2000
SCALE IN FEET



FIGURE 20. CULTURAL
LANDSCAPE OVERVIEW
1994 - SARO

Canyon and Mesa Prieta, and areas within the volcanoes themselves.

As a result of the numerous areas within this component landscape that have avoided primary disturbances, the setting has been determined to contribute to the integrity of the historic-vernacular landscape associated with the Atrisco Land Grant.

Design: The design on the landscape within the park is subtle but significant, in that it represents the traditions and practices of several cultural groups. With regard to the historic-vernacular landscape, the design is driven by function and need. Sheltered locations were sought out for the development of corrals; shepherd camps; and religious activities, such as those held by the Brothers of the Penitente.

Although the design associated with this vernacular landscape is subtle, it is still readily evident to the trained eye and contributes to our present-day understanding of the use and management of this landscape. The criterion of design contributes to the integrity of this historic-vernacular landscape.

Workmanship: There are very few man-made structural features associated with the historic vernacular-landscape at Petroglyph National Monument. The features that are present include corrals, holding pens, and some historic period petroglyphs. The workmanship associated with these noted features is representative of the utilitarian function these structures served. The stacked stone corrals and holding pens are irregular and random in their construction. Locally available lava boulders were simply stacked in a somewhat haphazard manner to create enclosures for the sheep. Natural openings occurring between large boulders were often filled with rock to prevent any potential escape routes for the sheep.

During the historic period, numerous petroglyphs were added to the basaltic boulders in the West Mesa area. The workmanship of these petroglyphs varies somewhat, but many of them are carefully executed and represent personal initials, brands, crosses, and other symbols. It has been suggested that these historic period petroglyphs reflect use or ownership of specific corrals or grazing areas, and mark religious shrines or Penitente ceremonial areas.⁴⁸

As with the design of this landscape, the workmanship that remains evident is highly characteristic of this vernacular landscape and contributes to the landscape's overall integrity.

⁴⁸ Brunneman, Eric. A Study of the West Mesa, Albuquerque, New Mexico. 1991. (on file at PETR).

Materials: As with the prehistoric landscape features, the primary construction material is the black basaltic lava boulders that are readily available in almost all areas of this landscape. This material was used to construct the corrals and pens needed for the livestock, and it was also used to delineate use areas for religious activities.

Other materials that were undoubtedly utilized for structures or other features would have included vegetative brush for the construction of chiceros (small brush holding pens for young sheep); sotol and yucca fibers; and wood from the nearby bosques of Rio Puerco and Rio Grande. The ephemeral nature of these materials has prevented the preservation of any structures that might have been constructed.

The existence of the more durable materials utilized by the Atrisco Land Grant heirs is still quite evident but the lack of the other materials is quite noticeable. Therefore, the criterion of materials minimally contributes to the landscape's integrity.

Feeling: The historic-vernacular landscape associated with the Atrisco Land Grant was historically characterized by the feelings of isolation and solitude. These feelings may still be experienced when one is visiting the park, but the areas that offer this experience have been reduced. Historically, one had but to find one's way across the Rio Grande and head west into the still-quiet and majestic grandeur of the prominent escarpment and the volcanoes. Nowadays, the city is expanding into the hinterland areas, and the quiet and solitude of the West Mesa area are being diminished.

There are a few features within the historic-vernacular landscape of the West Mesa that may evoke a sense of the past in visitors. Although the subtle nature of features such as the stone corrals or historic petroglyphs may require their initial identification by park staff or interpretive media, once they are identified, visitors can use them to help develop their own individual appreciation and understanding of past life-ways.

A sense of the past will easily be experienced by some visitors as they walk into some of the undeveloped canyons, such as those at Rinconada and Boca Negra. By experiencing the landscape at a pedestrian pace, visitors will be exposed to similar breezes, sights, and smells as those experienced historically. Although today's visitors may notice some intrusive sensory features, such as automobile exhaust or vehicular noise from nearby automobiles or low-flying aircraft, these intrusions are generally ephemeral and should be outweighed by the landscape's natural stimuli, which might include the cries of a hovering red-tailed hawk; the frantic rush of a

desert cottontail in search of shelter; or the wind gently blowing through the Indian ricegrass. As visitors walk along, they will be more likely to sense the rhythm of the place, and experience first hand some of the associations between these component landscapes and the larger framework of which they are a significant part.

The criterion of feeling has been determined to significantly contribute to the overall integrity of the historic-vernacular landscape.

Association: As discussed earlier, both of the defined historic landscapes found within Petroglyph National Monument are component landscapes that are associated with much larger and more comprehensive landscape areas.

An important association that continues to thrive with regard to the Atrisco grant landscape is the one that exists between the land and the land grant heirs who have held onto and managed this property for hundreds of years. In fact, approximately 50,000 acres of the original 82,000-acre grant continues under the management of the Atrisco group. This is something of a rarity in this day and age.

The historic-vernacular landscape has also maintained its association with the surrounding natural landforms, including the mountain ranges, river (although it has been channelized), and the valley, as well as with the growing City of Albuquerque.

The continued association of the Atrisqueños contributes significantly to the overall integrity of this vernacular landscape.

Plant-community Organization: The overall community organization of the historic-vernacular landscape has changed little if any from that of the present day. The landscape is dominated by broad, grassy plains, with scattered clumps of juniper following the drainage-ways. Areas that have been subject to ground disturbance have responded by noticeable shifts in species composition, but the overall organization seems to have changed little.

This criterion contributes to the landscape's integrity with regard to the National Register.

Species Composition: As mentioned above, the species composition within the historic-vernacular landscape has been modified as a result of human use and activity within the area. Grazing of livestock and disturbance of the soils by myriad activities that range from vehicular use to mining and bombing operations have encouraged new dominant grasses to replace those that were historically

dominant. Disturbance has also resulted in increased distribution of species such as snakeweed, rabbitbrush, and Russian thistle.

According to Hagood, some of the extremely rocky areas that were undesirable for grazing and other activities have served to protect the natural species composition that was historically associated with this landscape.⁴⁹ In these areas, the dominant grasses are black grama and bush muhly, while the four-wing saltbush is the dominant shrub.

Although there have undoubtedly been shifts in the dominant species as a result of land-use activities, it appears that the majority of plant species that comprised the historic-vernacular landscape are still present. For this reason, this criterion has been determined to contribute to the overall significance of the landscape.

Management Techniques: At present, little has been recorded regarding land management techniques utilized by the early land grant heirs along the West Mesa lands. Communal use of the vast grasslands for sheep grazing was the primary form of land management. Future oral and ethnohistories should be looked upon to fill in these gaps of information regarding the cultural landscape--its use and management.

With minimal information readily available regarding this criterion, it does not contribute to the integrity of this landscape with regard to the National Register.

Summary: In summary, it has been determined that the historic-vernacular-component landscape located within the boundaries of the park has retained its integrity, particularly in the areas of location, setting, design, feeling, and association, and community organization.

Historic-designed-component Landscape (1710-1944):

Location: The historic-designed-component landscape and its associated character-defining features remain in their original locations. The majority of the character-defining features associated with this landscape have been ephemeral in nature, and have slowly weathered away. However, the locations of these features may be identifiable through archeological investigations, remote-sensing techniques, or oral histories. The locations of various use areas within this historic-designed landscape are

⁴⁹ Hagood, Allen. Natural Resources of the West Mesa Petroglyphs Study Area. NPS-DSC. 1987.

similar to those of the historic-vernacular landscape, in that they are obvious to the keen observer and may be interpreted for the interested park visitor.

Setting: The overall setting for the historic-designed-component landscape has changed considerably with the encroachment of urban development surrounding this once relatively remote area. Much of the historical significance associated with the design of this open-space landscape stems from its isolated setting away from the hub of urban development. The military chose the West Mesa area for the siting of its bombardier target range because of its remote setting and sparse development. The City of Albuquerque and the State of New Mexico acquired open-space lands in the area for much the same reason. The siting of numerous airports and airline flight paths was also directed by the remote and undeveloped nature of the area.

Although there is extensive development of the land within the West Mesa area, it should be noted that the primary land forms that define the natural setting for the historic-designed-component landscape remains intact. The immensity of these landforms serves to minimize the overall impacts of the modern developments that now surround this potentially significant landscape resource.

Once visitors enter the landscape that is included within the park boundaries, they will find that there are numerous areas where the setting is virtually the same as it was during the time period associated with the historic-designed-component landscape (1710-1944). Some exceptionally good areas for experiencing the undisturbed setting include those along the mesa top, on the eastern side of the volcanoes area, around the North and South Geologic Windows, and within the volcanoes themselves.

As a result of the continued existence of areas that reflect the remote character of the landscape as it was during this historic period, it has been determined that the criterion of setting contributes to the overall integrity of the historic-designed landscape.

Design: As with the historic-vernacular-component landscape, the design elements are subtle but significant, in that they represent the varied uses and patterns imposed on the land by a variety of cultural groups. The design on the land that represents the historic-designed landscape was determined by socio-economic as well as political factors. These design elements are primarily represented by land patterns that were created by various cultural groups as they sought to divide and establish ownership rights over the land and its associated resources.

The design remnants of military activities and use represent historic military strategies for national defense and public safety. Although many of these design patterns can be determined from the use of archival materials (such as maps and construction drawings) or remote-sensing technologies, field verification continues to be important. Because of the intact nature of many of these design-related features, it has been determined that the criterion of design contributes to the overall significance of this landscape.

Workmanship: There are very few man-made structural features associated with the historic-designed-component landscape at Petroglyph National Monument. Some of the military's bombardier targets are still evident, particularly from the air. These remnants reveal that the bull's-eye targets were simply bladed into the ground surface. The associated wooden targets that were built by the Works Progress Administration (WPA) are no longer present.

Other extant features representing this period of 1710-1944 include stacked lava boulder cairns that most likely served as early boundary markers, and possibly some intact fence alignments that were established by the military to prevent livestock from wandering onto the target ranges.

Due to the limited number of extant features that show characteristic workmanship associated with this period, it has been determined that this criterion does not contribute to the landscape's integrity.

Materials: With the exception of the lava boulders used to construct the boundary markers/cairns, there is little evidence within today's landscape of the materials that were utilized for the development of the historic-designed-component landscape.

It has been determined that the criterion of materials does not contribute to the integrity of this landscape.

Feeling: The historic-designed-component landscape associated with the West Mesa area was historically characterized by the feelings of isolation and remoteness from the surrounding urban development of the City of Albuquerque. Although these feelings may still be experienced by visitors, the areas that offer this experience have been reduced.

The harshness of the West Mesa area and a lack of technological developments that would allow for deep-well drilling prevented the area from being permanently settled and developed. Up until the 1940s and 1950s, the entire West Mesa area remained a place apart from the hustle and

bustle of the ever-growing City of Albuquerque. The first water well was drilled on the mesa top in the early 1950s, and opened the way for cattle ranching operations such as Volcano Ranch. Nowadays, the city is expanding into the hinterland areas, and the quiet and solitude of the West Mesa area is being diminished.

The criterion of feeling contributes to the integrity of the historic-designed-landscape because there continue to be areas within park boundaries that allow visitors to understand the historic remoteness of this landscape and its desirability for military training operations and maneuvers, airline flight paths, and open-space lands for the citizens of Albuquerque to retreat to for outdoor experiences, contemplation, and solitude.

Association: As mentioned in earlier discussions, both of the defined historic landscapes found within Petroglyph National Monument are component landscapes that are associated with much larger and more comprehensive landscape areas.

The historic-designed-component landscape has maintained its association with the surrounding natural landforms including the mountain ranges, river (although it has been channelized), and the valley, as well as with the growing City of Albuquerque. This landscape's association with the remainder of the military target range area has been lost as a result of surrounding development of the mesa lands to the west and north of the park.

It has been determined that the criterion of association does not contribute to the integrity of this landscape.

Plant-community Organization: The overall plant-community organization of the historic-designed-component landscape has changed little if any from that of the present day. The landscape is dominated by broad, grassy plains, with scattered clumps of juniper following the drainage-ways. Areas that have been subject to ground disturbance have responded by noticeable shifts in species composition, but the overall organization seems to have changed little.

Areas of disturbance are identified by a variety of plant species, including snakeweed and Russian thistle, but when the landscape is looked at as a whole, the community organization has remained much the same, although the siting or locations of some of the communities have been altered. This criterion contributes somewhat to the overall integrity of the landscape.

Species Composition: As mentioned above, the species composition within the historic landscapes has been modified as a result of human use and activity within the

area. Grazing of livestock and disturbance of the soils by myriad activities that range from vehicular use to mining or bombing operations have encouraged new dominant grasses to replace those that were historically dominant. Disturbance has also resulted in increased distribution of species such as snakeweed, rabbitbrush, and Russian thistle.

According to Hagood, some of the extremely rocky areas that were undesirable for grazing and other activities have served to protect the natural species composition that was historically associated with this landscape.⁵⁰ In these areas, the dominant grasses are black grama and bush muhly, while the four-wing saltbush is the dominant shrub.

The NPS is fortunate, because very few exotic species have been introduced to this magnificent grassland-dominated landscape. This criterion contributes to the integrity of the historic-designed landscape.

Management Techniques: The land management techniques used in the West Mesa open-space lands varied from one user group to the next. The land served as common grazing lands from the early 18th century into the 19th century. During the 20th century, the area was used for its extractive resources, and some areas were leased to specific ranchers for grazing purposes. By the mid-20th century, much of the land was leased by the U.S. Government for military training operations.

It appears that there was no comprehensive management approach associated with this landscape during the historic designed landscape period (1710-1944). The land was merely set aside and utilized as needed.


This criterion does not contribute to the integrity of this landscape.

Summary: In summary, it has been determined that the historic-designed-component landscape located within the boundaries of the park has retained its integrity, particularly in the areas of location, setting, design, feeling, community organization, and species composition.

Schematic maps have been prepared to identify areas within these two historic landscapes that represent specific use areas or areas with significant character-defining features that are sensitive to change and should be preserved and managed accordingly (figures 21, 22, 23, and

⁵⁰ Hagood, Allen. Natural Resources of the West Mesa Petroglyphs Study Area. NPS-DSC. 1987.

24). The following recommendations will reference the areas shown.



ATRISCO LANDS NOW WITHIN MONUMENT



DENOTES AREA W/SIGNIFICANT
CHARACTER-DEFINING FEATURES,
DETERMINED "SENSITIVE TO CHANGE"

ATRISCO HISTORIC VERNACULAR COMPONENT LANDSCAPE

FIGURE 21-A . CULTURAL LANDSCAPE OVERVIEW

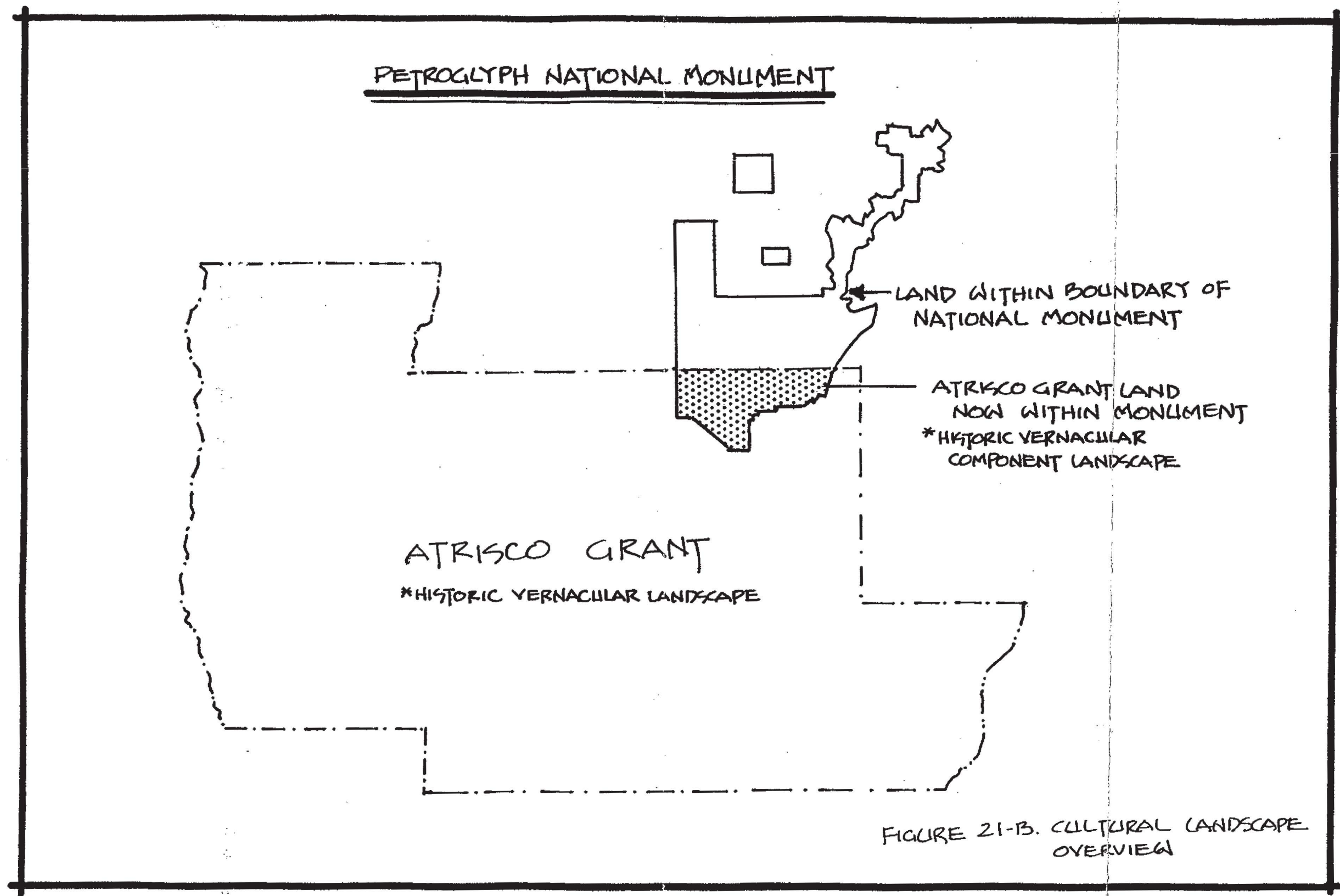
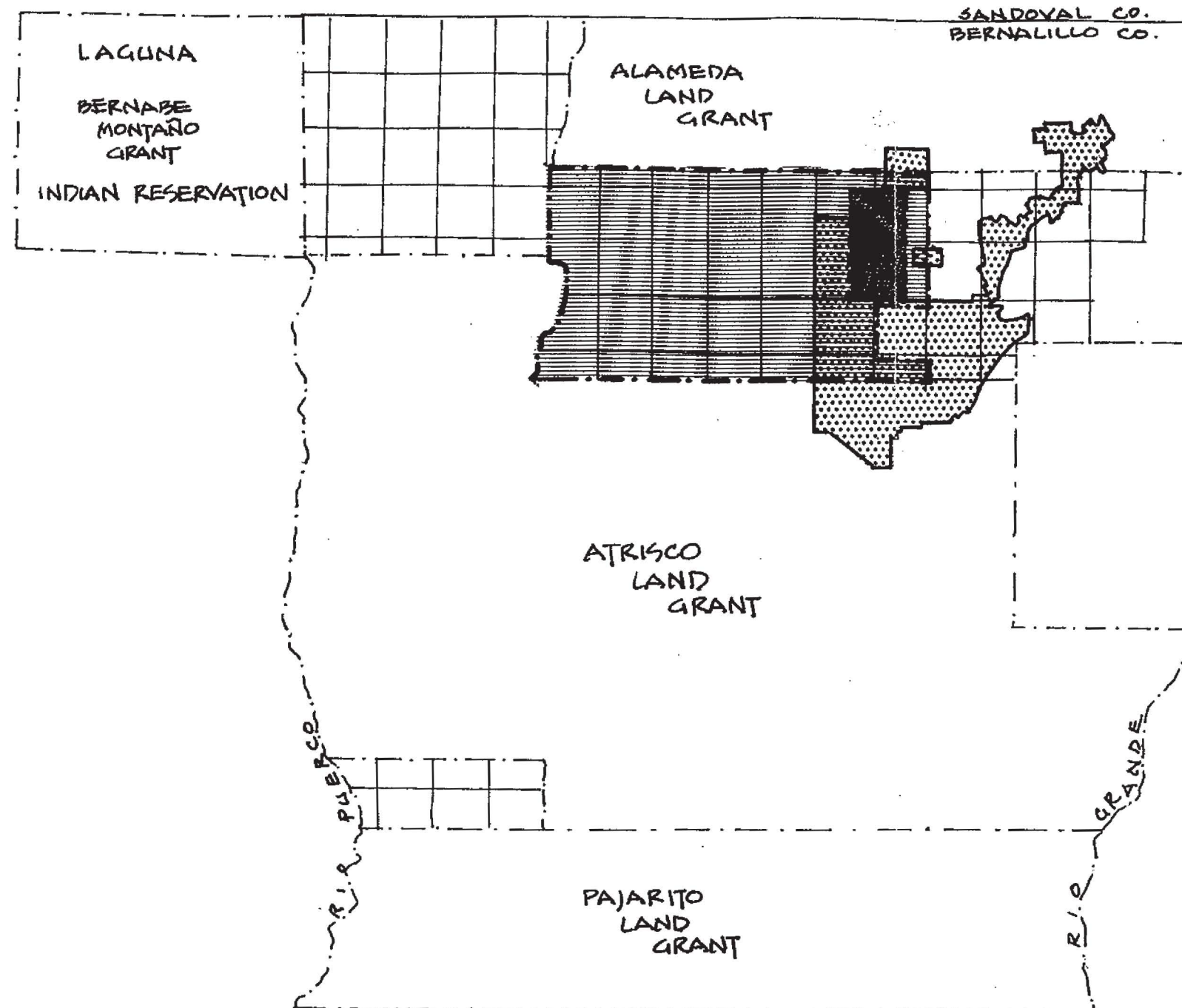


FIGURE 21-B. CULTURAL LANDSCAPE OVERVIEW



PETROGLYPH NATIONAL MONUMENT
 HISTORIC DESIGNED LANDSCAPE
 WAR DEPARTMENT LEASE
 FOR WWII BOMB RANGE

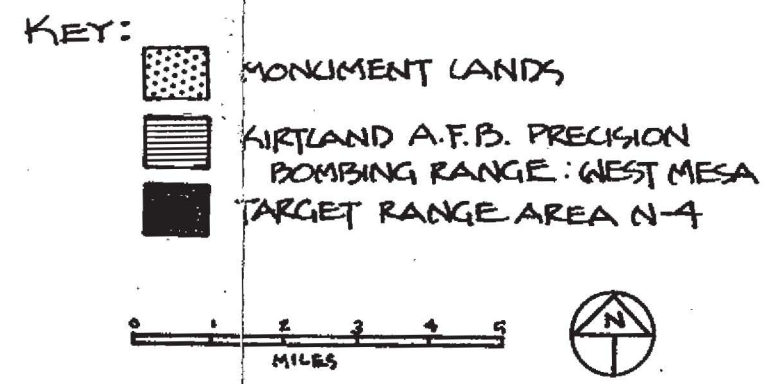


FIGURE 22. CULTURAL LANDSCAPE OVERVIEW

ON MICROFILM

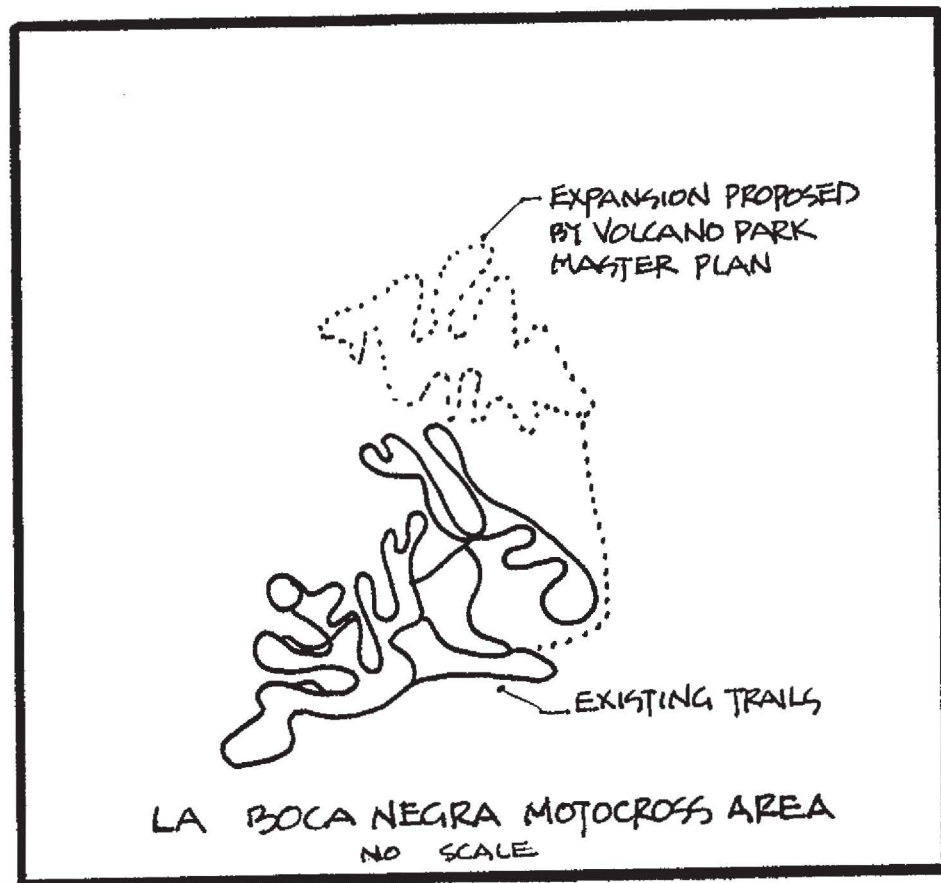
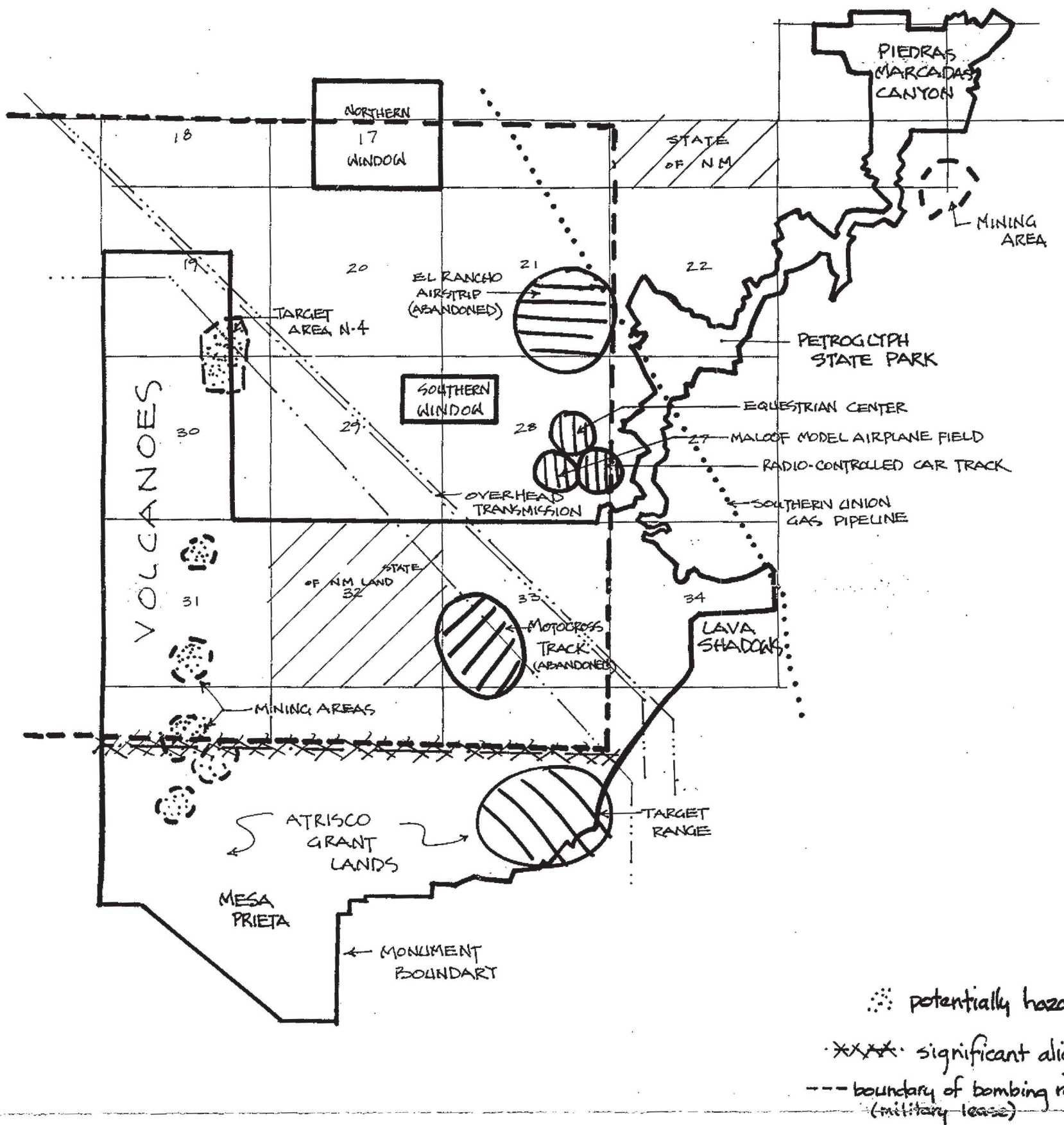


Figure 23. Detailed sketch of 1960's Motocross Track and 1980's proposed expansion. See Figure 24 for site location.



HISTORIC DESIGNED
 COMPONENT LANDSCAPE
 FIGURE 24. CULTURAL LANDSCAPE OVERVIEW
 1994/SWRD

RECOMMENDATIONS

INTRODUCTION

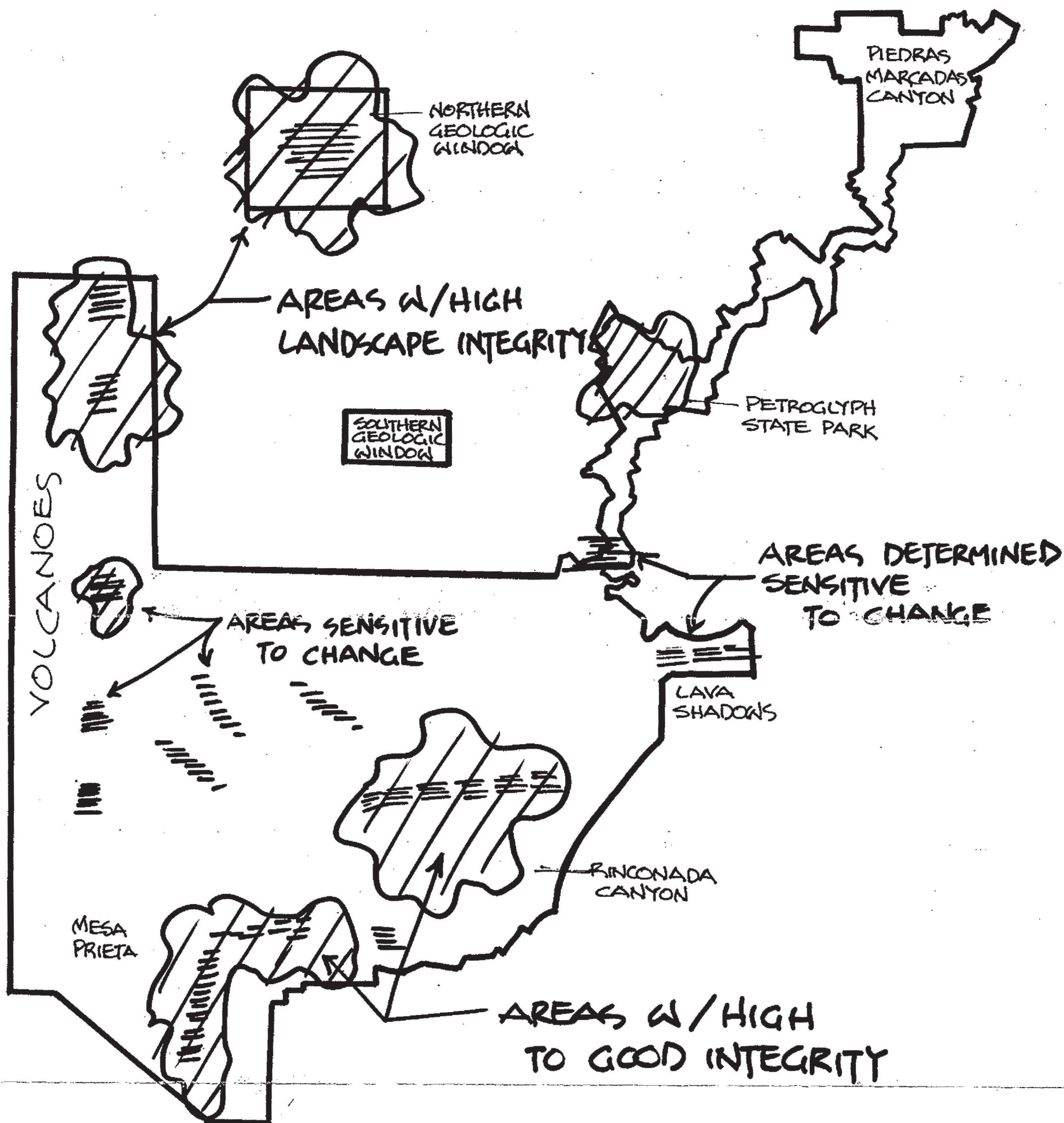
Following the preliminary evaluation and assessment of the field and research findings of this Cultural Landscape Overview for Petroglyph National Monument, some general management recommendations were developed to address the cultural landscape resources within the park. These recommendations will be incorporated into ongoing park planning documents, including the General Management Plan, Resource Management Plan, and Interpretive Prospectus.

It should be noted that a majority of the landscape resources associated with Petroglyph National Monument have significance and value with regard to esthetic, scientific, educational, and religious considerations. The following discussion of management recommendations for the park's significant landscape resources identifies areas that represent the various aforementioned values and discusses their sensitivity to change.

The recommendations provided herein were developed to assist planners in addressing some of the problems and issues that have been identified by the park, region, and Denver Service Center, and to help ensure the preservation of the park's significant cultural landscape resources.

Recommendations regarding the long-term management of the park's cultural landscape resources should not be developed until a full Cultural Landscape Report has been completed. The Cultural Landscape Report should build upon the information provided by this study, and provide a more exhaustive examination of the various landscapes and the many groups responsible for their modification and development through history to the present day.

The areas identified on the composite landscape map (figure 25) as "sensitive to change" or "potentially hazardous" should be avoided by any type of future developments or subsurface disturbances, including visitor facilities, trails, and roads. Site analyses revealed that these areas contain sensitive, character-defining features determined to be essential for understanding the development or use of the park's cultural landscapes (figure 26). The sensitive nature of these features is determined by their vulnerability to human actions--even those that may be unintentional, such as the moving of stones that define an alignment or a historic corral. Other areas are determined to be significant as a result of their continued importance to traditional user groups (figure 27).



CULTURAL LANDSCAPE OVERVIEW:
AREAS SENSITIVE TO DEVELOPMENT
AND CHANGE

PETROGLYPH NATIONAL MONUMENT

0 1000 4000
500 2000
SCALE IN FEET



FIGURE 25.
CULTURAL LANDSCAPE
OVERVIEW 1994-S&RO

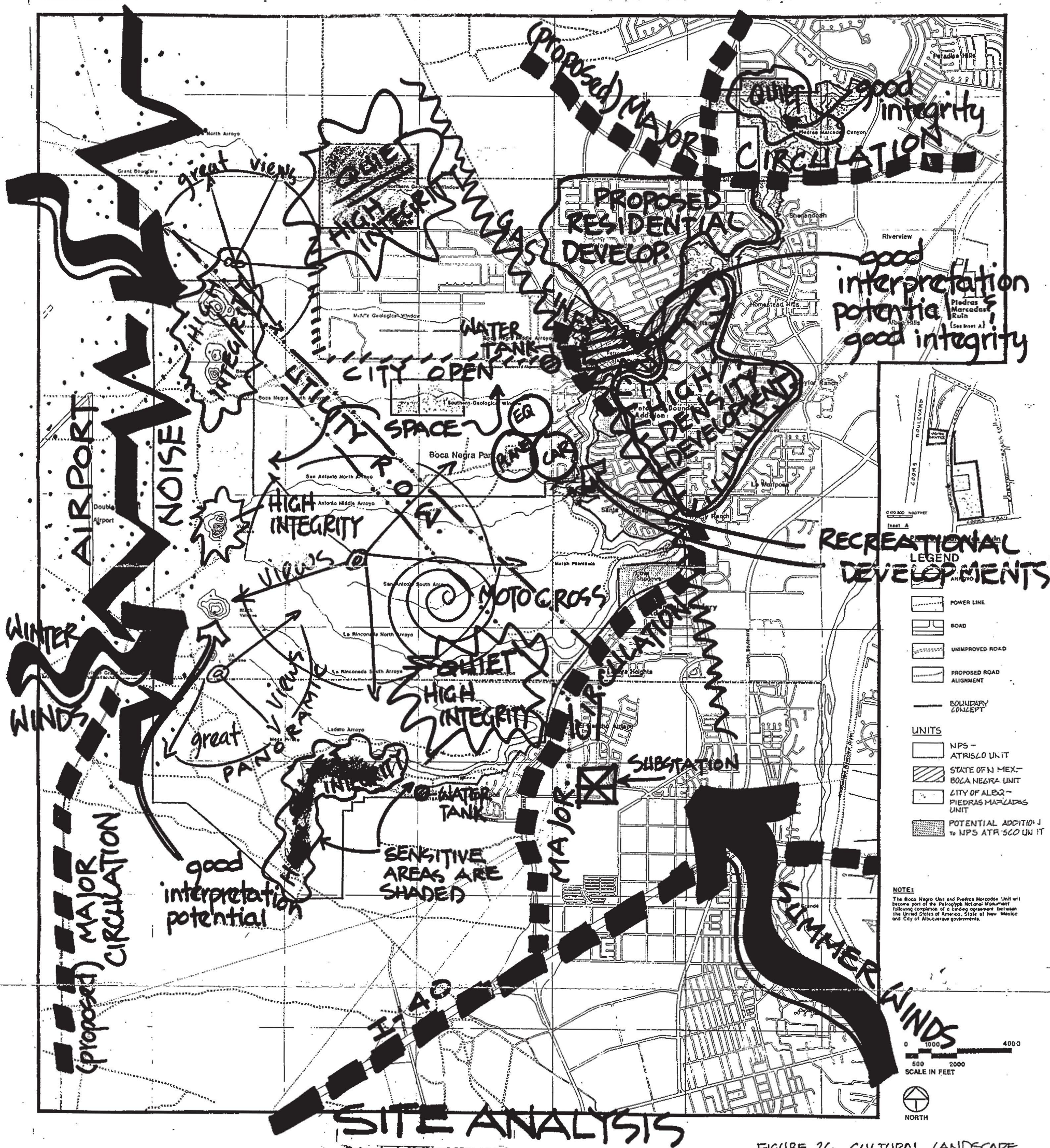
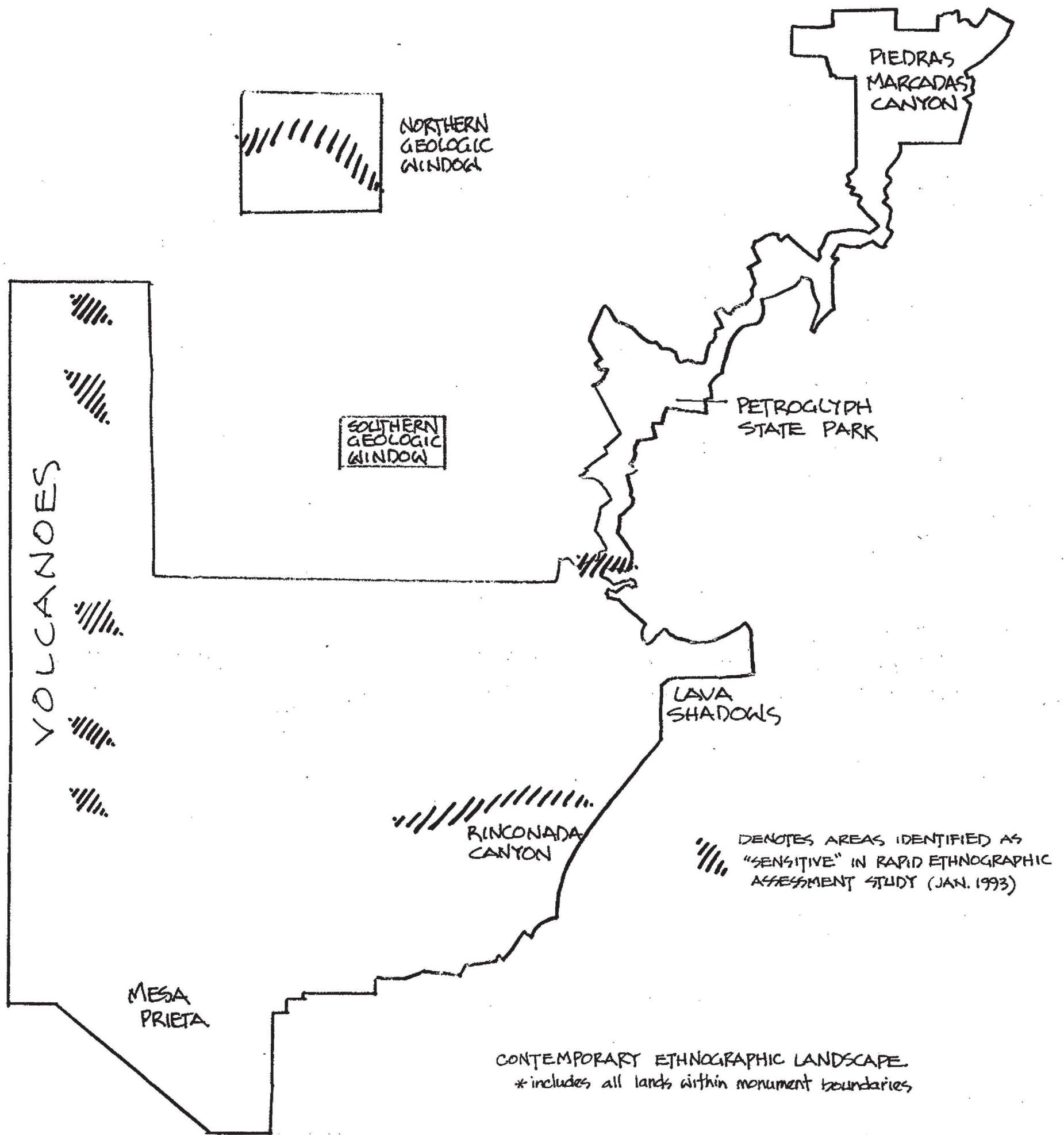


FIGURE 26. CULTURAL LANDSCAPE OVERVIEW - 1994/SWRO



PETROGLYPH NATIONAL MONUMENT

0 1000 4000
500 2000
SCALE IN FEET



FIGURE 27. CULTURAL
LANDSCAPE OVERVIEW
1994/SGIRO

354/20023
12 of 13

ON MICROFILM

The areas determined "potentially hazardous" include those with open or partially filled mining or exploratory shafts, quarry pits, and a military target range. It should be noted that the Certificate of Clearance issued in 1952 for target range N-4 states that "the area had been cleared of dangerous materials and recommended that the area be restricted to surface use only."

PUBLIC USE

The controlled use of horses and/or bicycles on established and maintained trails along the mesa top can be accomplished without impacting the cultural landscape resources within the park. However, due to the potential for erosional impacts, these multipurpose trails will require continuous maintenance, and should be kept to a minimum. The use of bicycles and horses should be kept away from the edge of the escarpment and off of the volcanoes.

Because trail locations and other circulation routes have the potential for accelerated erosion problems within this sensitive landscape, new trails and circulation systems should be carefully selected to follow existing jeep trails and ranch roads when possible, and avoid sensitive, character-defining features that contribute to the significance of the landscape resources. These features include many of the rock alignments, stacked stone corrals, and plant assemblages that may have significant associations with clusters of petroglyphs. Areas that have been identified as sensitive with regard to the ethnographic landscape should also be avoided. Some of the areas that are strongly recommended for avoidance include the Marsh Peninsula, because of the sensitive nature of the numerous stone alignments that run the length of the peninsula; and also the area of the Morning Star, which has been proposed for a scenic overlook location in Alternative 2.

The scenic loop drive proposed in Alternative 3 for the mesa top has the potential to impact landscape resources and the overall visual quality of the mesa top. If this alternative should be implemented, the road should be located so as to take advantage of the naturally occurring swales and depressions within the landscape in an effort to reduce the visual impact of the various automobiles and recreational vehicles that will utilize this roadway.

Immediately outside of park boundaries, there are a model-airplane field and a radio-operated-car track. Although the noise of the model-airplane field is at times highly intrusive, this appears to be a relatively compatible use for lands neighboring the park. Both the radio-car track and the airplane field require minimal areas with low building mass, because most of the development consists of flat paved surfaces. Alternative 2 of the park's General Management Plan recommends that a study be done to identify other locations for the airfield.

VISITOR USE / NEEDS

Included in the proposed new facilities for the park are parking areas associated with new buildings; parking areas for scenic overlook areas; access, entry, and scenic roadways; visitor center; picnic shelters; restroom facilities; and interpretive waysides.

The siting of these proposed facilities should avoid impacting sensitive landscape areas and their significant character-defining features. When feasible, development is encouraged in those areas already disturbed by existing facilities, such as in the vicinity of Boca Negra Canyon.

Proposed development for the Rinconada Canyon area should be minimal, and be limited to the disturbed area just below the northern peninsula of the canyon. Limits to development for this area are recommended because of the overall integrity of the landscape in this canyon, its current lack of development, and its potential to provide visitors with an experience uninterrupted by the surrounding urban area. For these reasons, any development related to visitor use should not be visible once visitors have entered the canyon trail.

The siting of a visitor contact/comfort facility and associated parking is understandably desirable for this area of the park, because Rinconada provides excellent opportunities for viewing petroglyphs in relative isolation and solitude. The broad expanses of grassland that run along the base of the escarpment in this canyon are character-defining elements within the prehistoric-vernacular and historic-vernacular landscapes, and should be preserved. There are few areas within the park boundary where these open expanses of undeveloped land at the escarpment base remain intact. For these reasons, any development related to visitor use should not be visible once visitors have entered the canyon trail. It is strongly recommended that the proposed parking be placed as close to Unser Blvd. as possible, to avoid the need for an entry drive; and that any necessary buildings and structures be carefully sited to allow the existing landforms, particularly the rolling dunes, to serve as a natural buffer or screen.

Proposed developments for the inner canyon area of Mesa Prieta are discouraged because of potential impacts to the visual quality of the area, in addition to impacts to archeological and natural resources. Although private development is proposed for the lands immediately adjacent to this area, the inner canyon area has retained a moderate to high level of integrity with regard to both the prehistoric-vernacular and historic-vernacular landscapes. Again, this is one of the few areas within the park boundary that has a substantial undeveloped land base along the bottom of the escarpment. The grasslands that comprise these areas are highly susceptible to change as a result of ground disturbance. The impacts of the proposed developments sited within the inner reaches of the canyon will be adverse as a result of not only the building itself but also the combined impacts of the access road into the

canyon area, the parking area required for the proposed use, and the installation of necessary utilities and other support infrastructure. Impacts to this area could be easily minimized by shifting the location of the proposed development to the outer areas at the entry to the canyon, thereby minimizing the length of access road needed, and concentrating development in the vicinity of Unser Blvd. and the surrounding private developments.

The sites selected for mesa top parking and scenic overlooks must be carefully selected to avoid potential impacts to the visual quality of the mesa top, as well as to avoid drainage and subsequent erosion problems that may affect the escarpment and resources below, such as the petroglyphs, vegetation, and soils. Impacts to raptors must also be considered, because they heavily utilize the most prominent areas along the escarpment for nesting and roosting activities. A location adjacent to Boca Negra Canyon and the re-aligned Unser Boulevard offers good potential for this type of development, because it would allow easy visual access to several panels of petroglyphs, lies in close proximity to the proposed visitor center location, and provides an area where automobiles will be sheltered from the view of people below the escarpment.

Along with mesa top parking and scenic overlooks, visitors will undoubtedly require shaded locations to provide them with a reprieve from the blazing New Mexico sun and heat. As discussed in earlier work sessions with the General Management Plan team and park staff, from a landscape perspective it is desirable that these shaded areas be provided through the use of inconspicuous structures such as ramadas, rather than introducing new species of vegetation that are not presently part of the site's existing and historic plant-community assemblage. Again, the vegetation patterns that comprise this area are highly characteristic of all of the identified potentially significant landscapes, and should be preserved.

Limited access to and development near the volcanoes is desirable, because this area provides wonderful photographic and interpretive opportunities. However, due to the sensitive nature of this area as identified by its contemporary ethnographic associations, visitor access must be controlled and possibly limited to the lower three volcanoes.

INTERPRETATION

Areas identified as having good potential for interpretation have been identified by this study, and are shown on the site composite map (figure 25). Although some of the landscape's character-defining features might easily be interpreted, the delicacy of their nature is such that, once identified, they may be inadvertently destroyed. Because some of the significant rock alignments and stone structures only consist of a course or two of stones, the

removal or displacement of any of these stones could result in a loss of the features.

The night sky and its associated astronomical features were important elements of the landscape throughout history. Each cultural group had its own unique map that it could read by the constellations and establish patterns for ceremonies and land management actions such as stock breeding or crop planting and harvesting. This resource would openly lend itself to interpretive programming. Additional information on this topic should be available through future ethnohistory and ethnographic research.

The areas that have been identified on the composite map include a representative example of some of the landscape's significant features that are in a relatively stable condition and can tolerate potential visitor impacts. Some areas such as the Northern Geologic Window are recommended for occasional docent-led interpretive tours, should the park consider this type of program for the future.

RESOURCE MANAGEMENT / PROTECTION

As noted earlier in this section, recommendations for the long-term management of the park's cultural landscape resources should only be developed following a full Cultural Landscape Report. Following more exhaustive research regarding the landscape's history and development, a preservation philosophy can be developed to address desirable management practices for the significant landscape resources that comprise Petroglyph National Monument. The management recommendations may identify various landscape areas and prescribe specific treatment approaches for each area, such as rehabilitation, restoration, or preservation.

It is recommended that until a Cultural Landscape Report has been completed, a philosophy of preservation be adopted for the cultural landscape resources. This approach will thereby ensure the protection of any resources that may not have been identified by this preliminary study.

THREATS

The integrity of the park's cultural landscape resources is threatened by various ongoing activities, which include deliberate vandalism to the resources such as shooting, spray painting, and otherwise defacing the petroglyphs; illegal dumping of trash ranging from household waste to appliances and furniture (the park estimates that National Park Service staff, environmental groups, and neighborhood volunteers have hauled approximately 120 tons of

trash to the county landfill); and incompatible and intrusive development. Other threats include accelerated erosion associated with the arroyos, roads, and trails that are found within park boundaries.

Potential future threats are predominantly outside of park boundaries, and have been identified as including demands for additional utility easements and rights-of-way; demands for roadway easements, such as those proposed for the extension of Paseo del Norte and the realignment of Unser Boulevard; proposals for engineered drainage improvements within the park to accommodate development beyond park boundaries; and proposed developments along the mesa top, including the Volcano Cliffs subdivision, expansion of the Double Eagle Airport, and proposed commercial and residential developments adjacent to the airport. The park staff will work with the City of Albuquerque and adjacent developers to minimize any potential adverse impacts.

Although the existing three-tower electrical transmission line poses a visual and aural intrusion for the resource, its low-mass structures readily fade into the expansive grassy plain when they are viewed from certain directions or angles. If additional electrical transmission is needed, it would be desirable to increase the carrying capacity of the existing line, rather than establishing additional powerline rights-of-way across the mesa top and subsequently increasing the impacts to the park.

Proposed engineered modifications to the drainage patterns along the mesa top will result in potentially adverse impacts to some of the landscape's significant character-defining features, such as the soil and water diversion or detention alignments associated with the prehistoric-vernacular landscape. Modifications to these natural drainage patterns will also result in changes to vegetation patterns and species composition, and will potentially create a visually intrusive scar across the landscape. Any proposed modifications to the park's drainage should address the long-term nature of these potential impacts, and, if determined to be necessary, a "soft" engineering approach should be utilized.

Proposed future developments along the mesa top are unfortunately inevitable, as are the myriad impacts they may have on the park. Where possible, park staff will work with adjacent landowners to establish buffer areas. In some areas, appropriate setbacks, such as those recommended in the Northwest Mesa Escarpment Plan, should be implemented. The park should work proactively with the City Council and Board of County Commissioners to help ensure implementation of the necessary guidelines and restrictions on new developments, and to minimize the occurrence of incompatible design.

VISITOR HEALTH / SAFETY

With regard to visitor health and safety, a few areas were identified that are "potentially hazardous," and may require management or treatment. All of these identified areas are located in the vicinity of the volcanoes.

Of special concern are two mining shafts in the immediate vicinity of the JA volcano. One of these shafts has been partially backfilled; however, this fill is subsiding, and poses a hazard for inquisitive visitors (figure 25).⁵¹ The second shaft is open at ground level, and extends downwards at least 12 to 15 feet. Numerous tumbleweeds have dropped into the shaft, obscuring its actual depth (figure 26). No date has been established for when these shafts were opened or what the focus of the exploration was. It is possible that the shafts are the result of testing for geothermal energy sources within or adjacent to the volcano.

There are other mining pits/quarries associated with the Black and Vulcan volcanoes. The potential danger in these areas is probably much less than in the open shafts, which seem to encourage human curiosity and the desire to explore.

Existing-condition photographs and locations for the two open shafts have been provided to Linda Dansby of the Environmental Coordination Division, Southwest Regional Office. Linda has been working on numerous mine-closure projects within the Southwest Region, and will assess the potential hazards associated with these areas and recommend treatment alternatives for the park. It is possible that closure through backfilling may be the most feasible alternative (as opposed to grating). No signs of use or habitation by native animal species were noted during field investigations. Of particular concern would be use by bats, but none were noted at the time of documentation.

Although these mining areas and individual features are considered character-defining with regard to the cultural landscape, visitor health and safety should be the primary concern when determining appropriate treatment.

The other area of primary concern is target range N-4, which is located just east of Bond Volcano. The Explosive Ordnance Division at Kirtland Air Force Base and the Office of Environmental Engineering at the U.S. Army Corps of Engineers are presently conducting an evaluation of 1940s bombing ranges in New Mexico. Because the Certificate of Clearance (dated 1952) for this bombing range states that activities in the area should be limited to

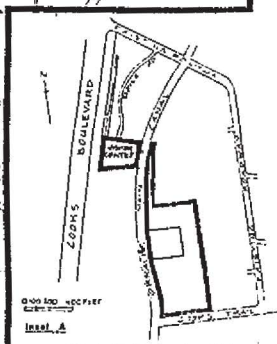
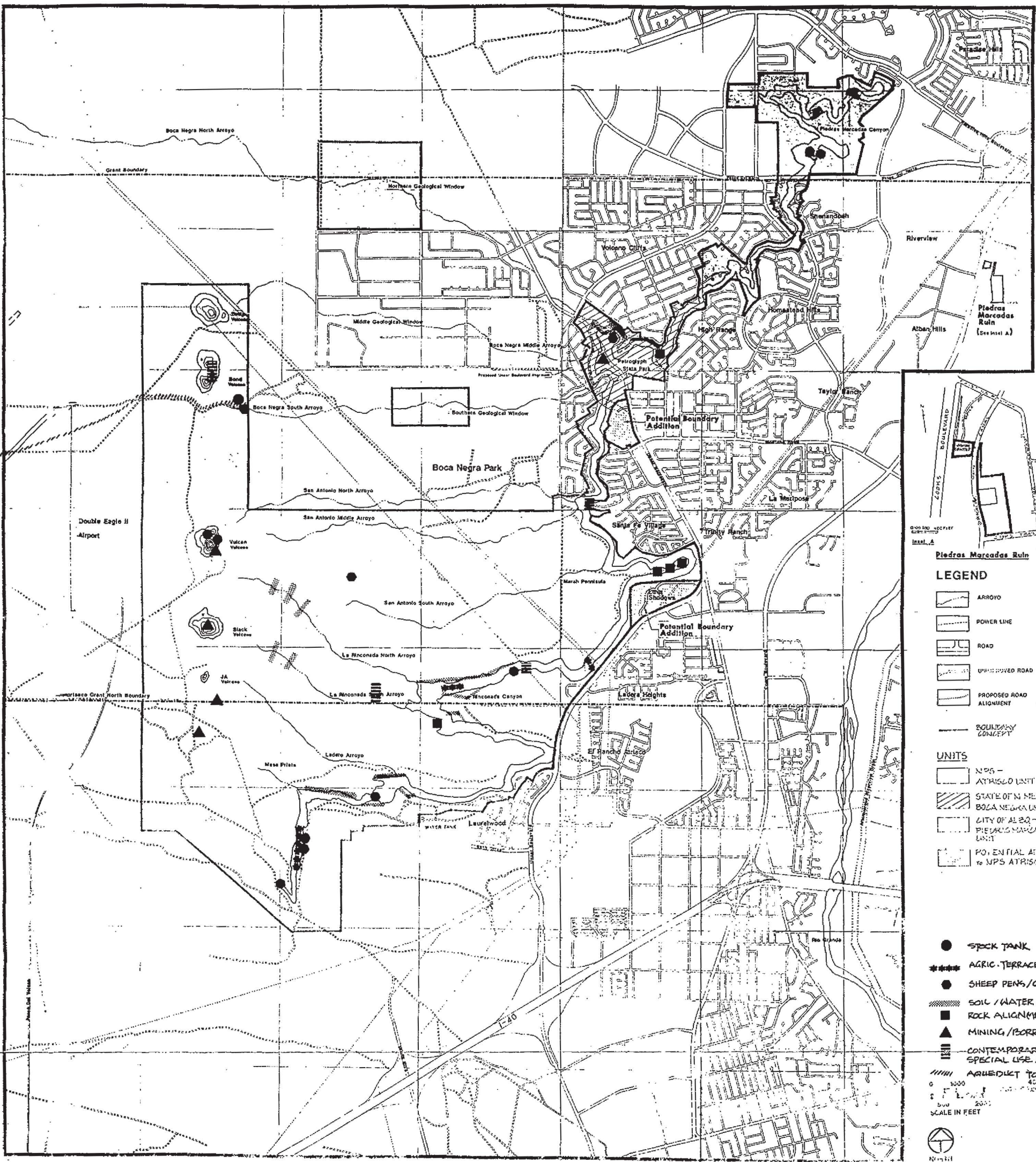
⁵¹ Field investigation by Regional Cave Specialist, Ron Kerbo, has identified this area as a possible natural opening that has subsided. However, the natural feature may have been explored and later filled by the Bond family while drilling for geothermal energy in the vicinity of the volcano. Additional research is needed prior to any action.

surface use only, it is recommended that the park should limit visitor access to this location.

FUTURE DATA NEEDS

With regard to future landscape-resource-related needs, the following studies are recommended to either precede or be conducted concurrently with a Cultural Landscape Report, oral history project, ethnohistory project, ethnographic project, and thorough deed search and deed history for lands within the park. The findings and records of early research and survey projects, such as the recording of petroglyphs conducted by Colonel Bain, should be examined and built upon by future studies.

The ethnographic and ethnohistory studies that entail detailed study of the American Indian and Hispanic (heirs of the Atrisco Land Grant) groups traditionally associated with the West Mesa area should have a high priority among the park's future data needs.



- LEGEND**
- ARROYO
 - POWER LINE
 - ROAD
 - UNIMPROVED ROAD
 - PROPOSED ROAD ALIGNMENT
 - BOUNDARY CONCEPT
- UNITS**
- NPS - ATRISCO UNIT
 - STATE OF N. MEX. - BOLA NEQUA UNIT
 - CITY OF ALBUQUERQUE - PIEDRAS MARCADAS UNIT
 - POTENTIAL ADDITION TO NPS ATRISCO UNIT

- STOCK TANK
 - *** AGRIC. TERRACE
 - SHEEP PENS/CORRALS
 - SOIL / WATER CONTROL
 - ROCK ALIGNMENTS
 - ▲ MINING / BORROW SITES
 - CONTEMPORARY SPECIAL USE AREAS
 - ////// AQUEDUCT TO STOCK TANK
- 0 1000 2000 4000
SCALE IN FEET

CULTURAL LANDSCAPE FEATURES
 Petroglyph National Monument
 Albuquerque West Mesa
 U.S. Dept. of the Interior / National Park Service

FIGURE 28. CULTURAL LANDSCAPE OVERVIEW - 1994/SGIRO

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APPENDIXES

- 1: CONSULTATION.***
- 2: LITTON LANDSCAPE TYPES***
- 3: MISCELLANEOUS MILITARY FILES
AND CORRESPONDENCES FOR WEST MESA RANGE SITES***
- 4: PRELIMINARY PHOTOGRAPHIC SURVEY
OF VIEWS AND VIEWSHEDS
WITHIN PETROGLYPH NATIONAL MONUMENT***

1: CONSULTATION

The following individuals were consulted during the preparation of the Petroglyph National Monument Cultural Landscape Overview:

National Park Service

Larry Beal, Community Planner/Team Captain,
Petroglyph NM GMP Planning Team

Eric Brunneman, Archeologist, Petroglyph NM

Art Ireland, Archeologist, Southwest Regional Office

Reed McCluskey, Chief Ranger, Petroglyph NM

Doug Bradford, Computer Specialist,
Cooperative Program Studies Unit

Dr. Milford Fletcher, Unit Leader,
Cooperative Program Studies Unit

Diane Souder, Chief, External Affairs, Petroglyph NM

Steve Whitesell, Superintendent, Petroglyph National Monument

Diane Rhodes, Archeologist, Central Planning Team,
Denver Service Center

Danny Forbis, Park Ranger, Law Enforcement, Petroglyph NM

City of Albuquerque

Matthew Schmader, Program Manager for City Open Space

Mary Davis, Planner

Mo Palmer, Photo-archivist

Individuals

Harry Davison; Military Historian; Kirtland Air Force Base;
Albuquerque, NM

Staff at SWRC; University of New Mexico; Albuquerque, NM

Staff at MAGIC; University of New Mexico; Albuquerque, NM

Staff at NM Archives; Santa Fe, NM

Staff at Laboratory of Anthropology; Santa Fe, NM

Edi Cherry, UNM School of Architecture

John Geissman, Department of Earth and Planetary Sciences,
University of New Mexico, Albuquerque, NM

Susan Gant; Environmental Engineer; U.S. Army Corps of
Engineers; Albuquerque, NM

2: *LITTON LANDSCAPE TYPES*

The following landscape types are taken from Litton, R. Burton, Jr., 1974. "Visual vulnerability of Forest Landscapes. Outdoor Recreation Research: Applying the Results." U.S. Department of Agriculture, U.S. Forest Service General Technical Report NC-9.

1. Enclosed landscape: Typically a valley, with sides enclosing your vision; definable by means of wall and floor characteristics.

2. Feature landscape: Dominated by feature objects or groups of feature objects that catch the eye.

3. Panoramic landscape: Little or no boundary restriction; level or undulating horizon with wide view.

4. Focal landscape: Series of essentially parallel objects seen in alignment.

5. Detail landscape: Tied to immediate foreground distances and pedestrian pace; minor details are noted.

6. Ephemeral landscape: Dependent on transitory effects; five groups or influences that exist are:

- Atmospheric and weather conditions (e.g., sunrise and sunset, clouds, fog).
- Projected/reflected images (e.g., shadows, mirrored images in still water).
- Displacements (e.g., fallen leaves, floods, windblown objects)
- Signs (e.g., animal tracks, spider webs)
- Animal occupancy (e.g., animal sightings)

**3: MISCELLANEOUS MILITARY FILES AND CORRESPONDENCES
FOR WEST MESA RANGE SITES**

HTW (B)

GEOTECH (B)

ENG/PLNG DIV

DDW
DE WMC

April 16, 1992

Engineering and Planning Division
Geotechnical Branch

Mr. Robert Gurule
Director of Public Works
City of Albuquerque
P.O. Box 1293,
Albuquerque, New Mexico 87103

Dear Mr. Gurule:

The U.S. Army Corps of Engineers, under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), has been tasked by the Department of Defense (DOD) to identify, investigate, and clean up environmental hazards that are a direct result of DOD activities at former installations. These hazards might include hazardous and toxic wastes, unexploded ordnance, unsafe buildings and underground storage tanks.

The Corps is currently performing the preliminary assessments (PAs) on two of the former Precision Bombing Ranges associated with Kirtland Air Force Base. The purpose of the PA is to make contact with current owners and users, establish site eligibility, survey the site for hazards, and verify and assess any reported hazards. All activities are contingent upon the current site owner's consent.

Through the Bernalillo County Assessor's Office, we have learned that the city of Albuquerque is listed as the current owner of part of one of these sites. This site consisted of 15,246 acres on the West Mesa, extending from just east of the volcanoes to the Rio Puerco Escarpment on the west, and from the southern boundary of the Town of Alameda Grant on the north to the northern boundary of the Town of Atrisco Grant on the south. As you know, this area contains the Double Eagle

Airport, the Shooting Range Park, the Soil Amendments Facility, many acres of Open Space lands and part of the Petroglyph National Monument. It is our understanding that the bombing range, in its entirety, has not been host to any ordnance-related injuries or accidents in the last fifty years, despite the amount of traffic the area has sustained in its proximity to the City.

Ms. Susan Gant, of my staff, has made contact with the Open Space manager, Mr. Steve Thomas and his staff; the airport manager at the Double Eagle Airport, Mr. Ernest Guenther; and the Shooting Range manager, Mr. Rick Vernon, to arrange access to the various known target areas on the site. A visual inspection found rusted debris of practice bombs on all but one of the target areas examined. The target area where no practice bomb debris was found, contained rusted debris characteristic of high-explosive (HE) bombs. The center of the target area is located approximately nine tenths of a mile north and 100 yards west of the northern end of the north-south runway at the Double Eagle Airport. The target is clearly visible on the attached aerial photo map of the area.

I have been informed that the city of Albuquerque has plans for road construction near the HE target area. While the danger of unexploded ordnance exists throughout the site, construction near the HE target area is of particular concern. It is our policy, that until established otherwise, a clear and present danger exists in the area of the HE target due to the potential presence of subsurface unexploded ordnance.

The Corps' center of expertise for unexploded ordnance is the Huntsville Division, in Huntsville, Alabama. In consideration of the proximity of the bombing range site to an active airport and a significant population center, Huntsville Division has been notified and will be kept informed throughout this phase of the investigation. We will recommend this site for a project consisting of a surface sweep and removal or destruction of any unexploded ordnance. Huntsville Division will review our proposal and may make separate or additional project recommendations to our headquarters in Washington, D.C.

If you have questions regarding the Defense Environmental Restoration Program as it pertains to the City's area of concern, please contact Ms. Susan Gant at (505) 766-1363 or Mr. David Gregory at (505) 766-1773, or address correspondence to the attention of David Gregory, (DERP) Coordinator.

Sincerely,

SIGNED

Gary R. Burroughs
Major, EN
Acting District Engineer

Enclosure

Copies Furnished:

Mr. Mark Money
City of Albuquerque
Property Management
P.O. Box 1293
Albuquerque, New Mexico 87103

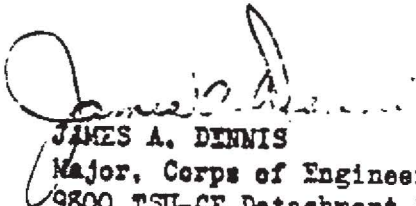
Mr. Carl Rodolph
City of Albuquerque
Director of Aviation
P.O. Box 1293
Albuquerque, New Mexico 87103

Mr. Steve Whitesell
Superintendent
Petroglyph National Monument
P.O. Box 1293
Albuquerque, New Mexico 87103

C E R T I F I C A T E O F C L E A R A N C E

All lands within the former Kirtland Air Force Base Bombing Target N-4, located approximately 20 miles Northwest of Albuquerque, New Mexico, have been given a careful search and have been cleared of all dangerous and/or explosive materials reasonably possible to detect. It is recommended that East one-half of Section 30, West one-half of Section 29, East one-half of Section 19, and West one-half of Section 20, T11N, R2E, as delineated on the inclosed 1939 New Mexico State Highway Department Map of Bernalillo County, New Mexico, and by this reference made a part of this certificate, be restricted to surface use only.

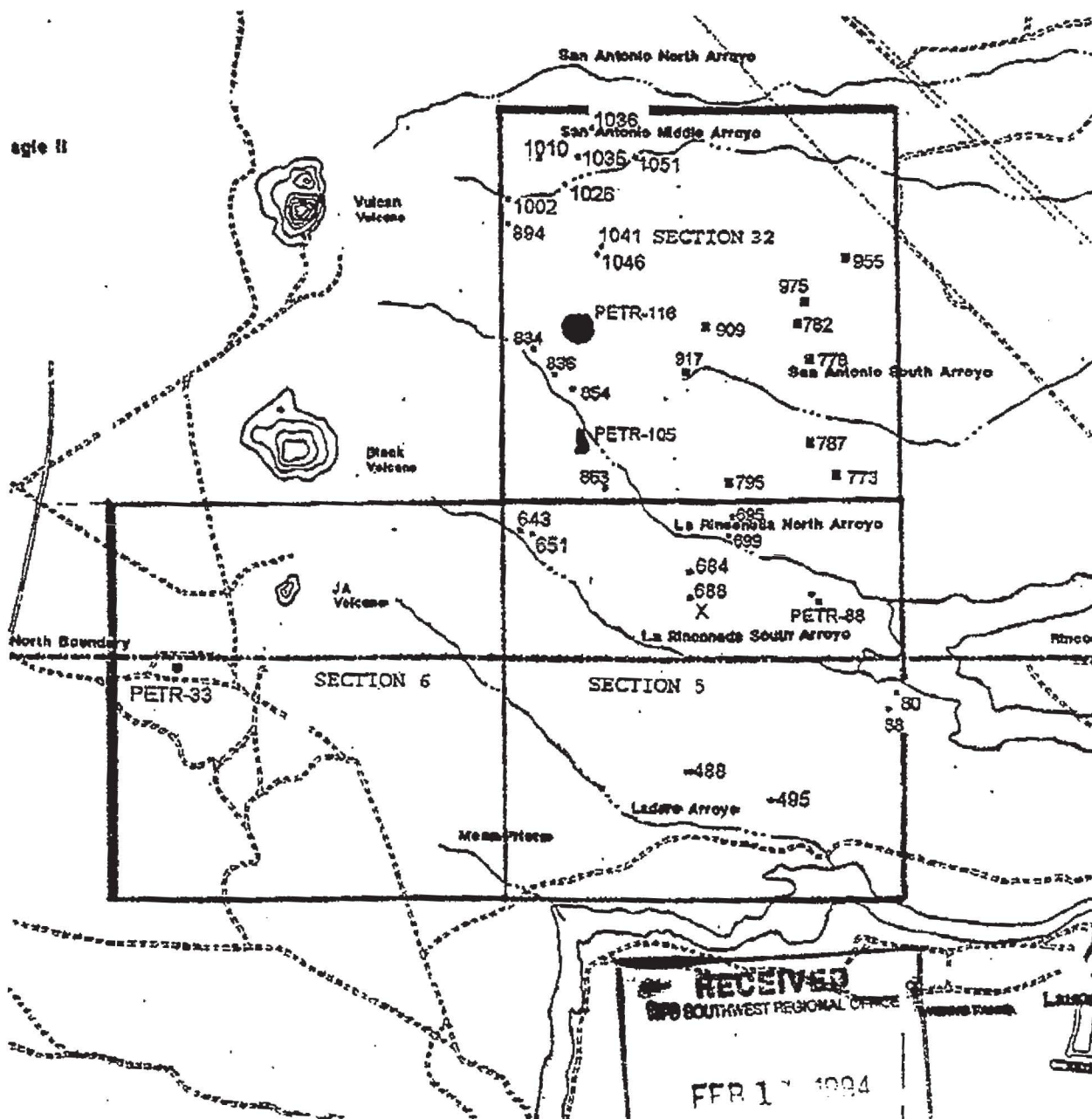
3 October 1952


JAMES A. DENNIS
Major, Corps of Engineers
9800 TSU-CE Detachment No. 13
Engineer Range Clearance Team
Commanding

28

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To: <i>Peggy Fraeschauer</i>	From: <i>Anne Gaidberg</i>
Co: <i>SWRO</i>	Co: <i>PETR</i>
Dept:	Phone #: <i>839-4429</i>
Fax #: <i>988-6876</i>	Fax #: <i>839-4594</i>



Legend

The following numbered artifacts were located during the 1992 and 1993 survey initiative at Petroglyph National Monument. The numbers are field references. An "X" in Section 5 marks the site where an unexploded practice bomb was removed by explosive specialists from Kirtland Air Force Base in 1993. Four archeological sites also produces pieces of military debris. These sites are noted by the prefix "PETR" followed by a site number.

Isolated Artifacts:

80	flare
88	flare parachute assembly
643	PBD and fuse
651	PBD and fuse
684	PBD
688	fuse
695	PBD
699	PBD
488	fuse
495	fuse
773	PBD
778	flare parachute assembly
782	flare parachute assembly
787	flare "M841/ LOT 3137-8A/ APR 1941/ ES CO"
795	PBD
834	flare
836	PBD
854	PBD
863	PBD
955	flare
975	Practice Bomb--possibly intact
1002	fuse
894	Practice Bomb--possibly intact
909	PBD
917	Practice Bomb--possibly intact
1010	PBD
1026	PBD
1035	fuse
1036	PBD
1041	PBD
1046	flare
1051	PBD

Archeological Sites:

PETR-83 fuse
PETR-88 debris from four practice bombs
PETR-105 flare parachute assembly
PETR-116 PBD

||

**4: *PRELIMINARY PHOTOGRAPHIC SURVEY
OF VIEWS AND VIEWSHEDS
WITHIN PETROGLYPH NATIONAL MONUMENT***



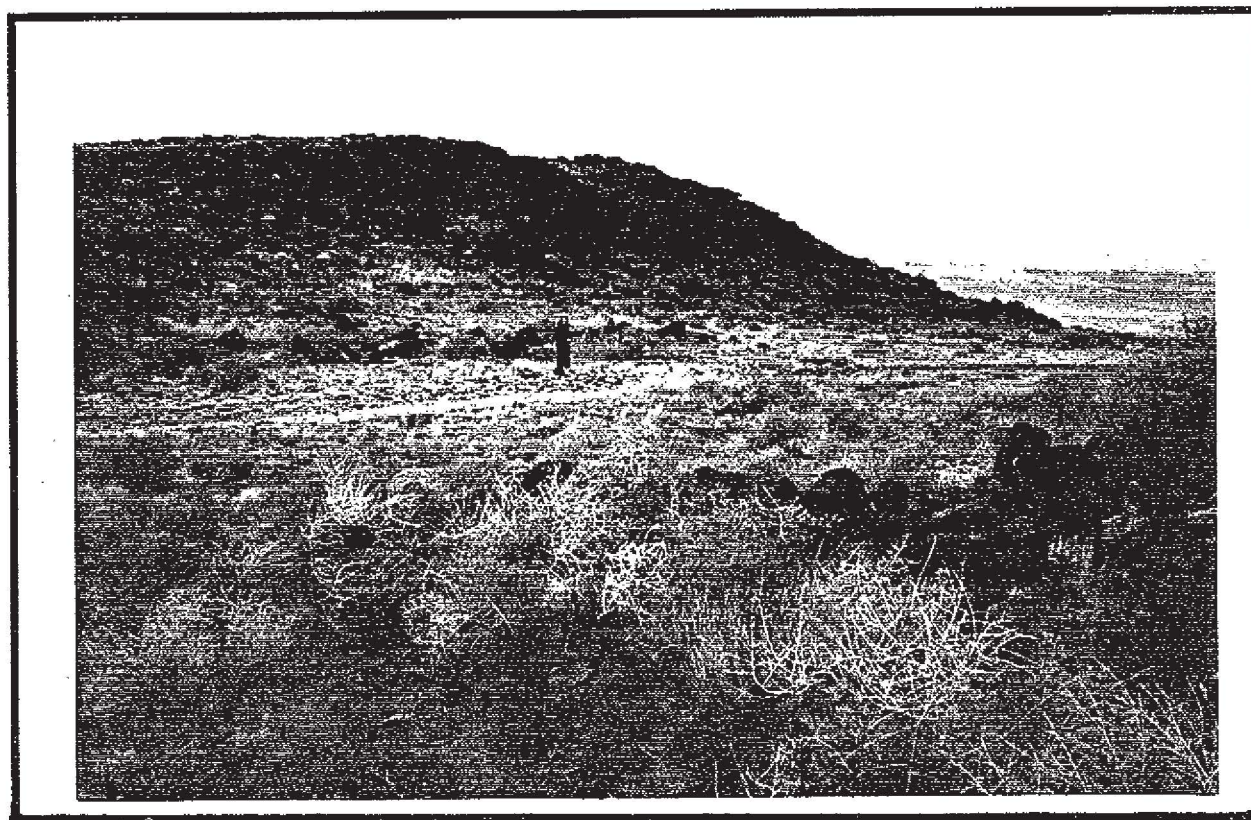
PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 1



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 2



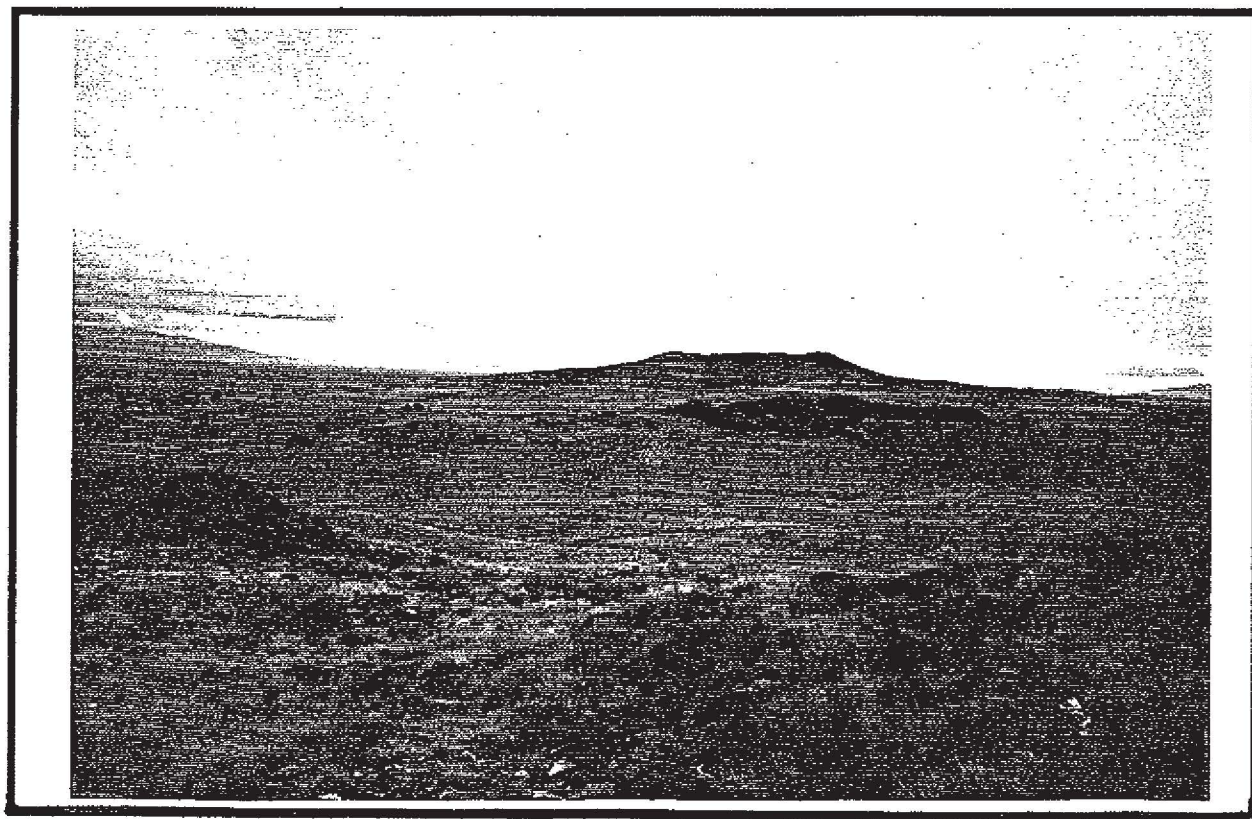
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PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 5



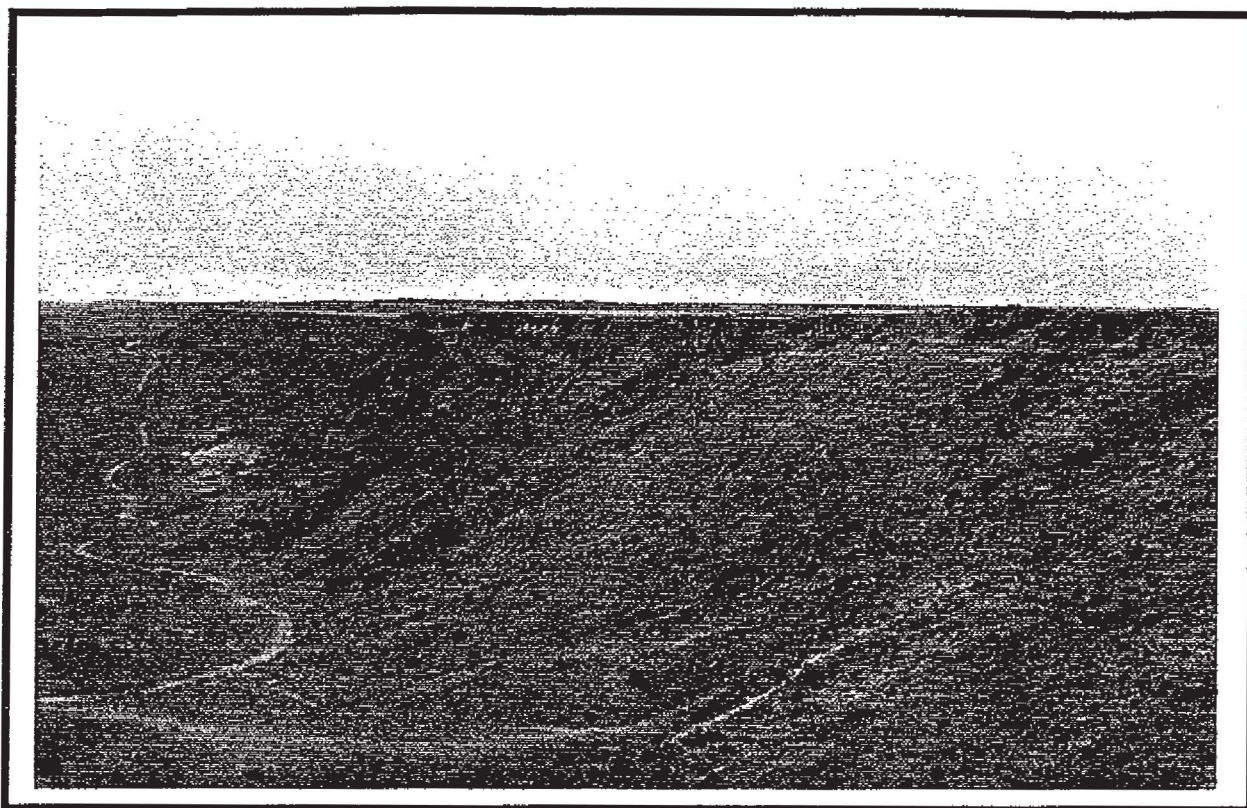
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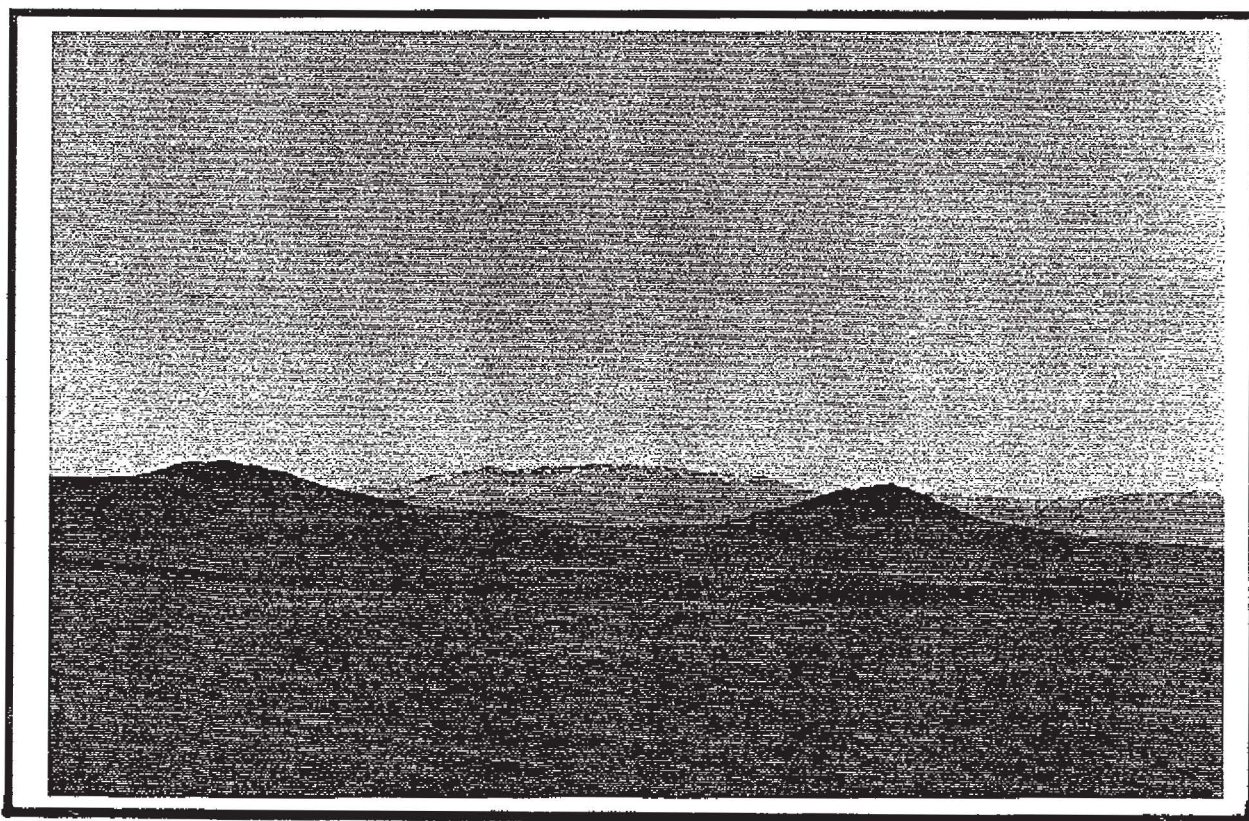
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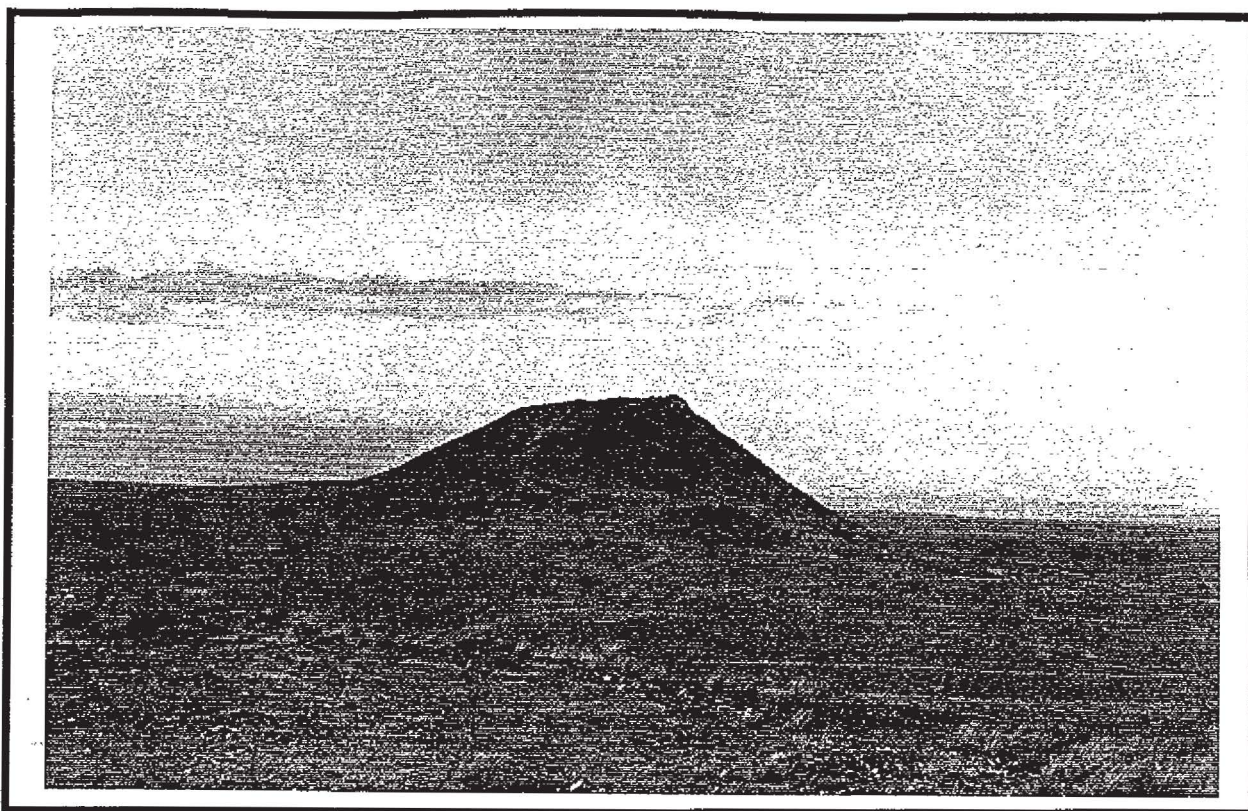
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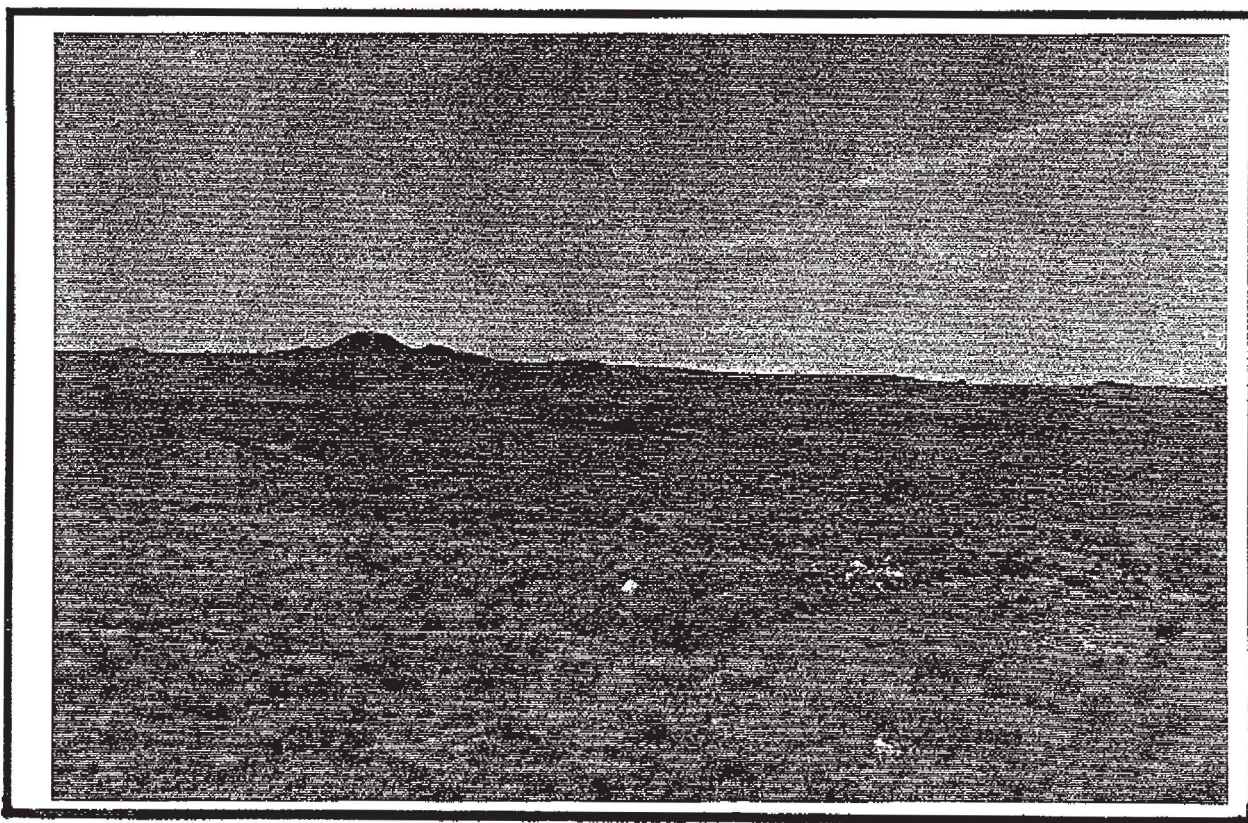
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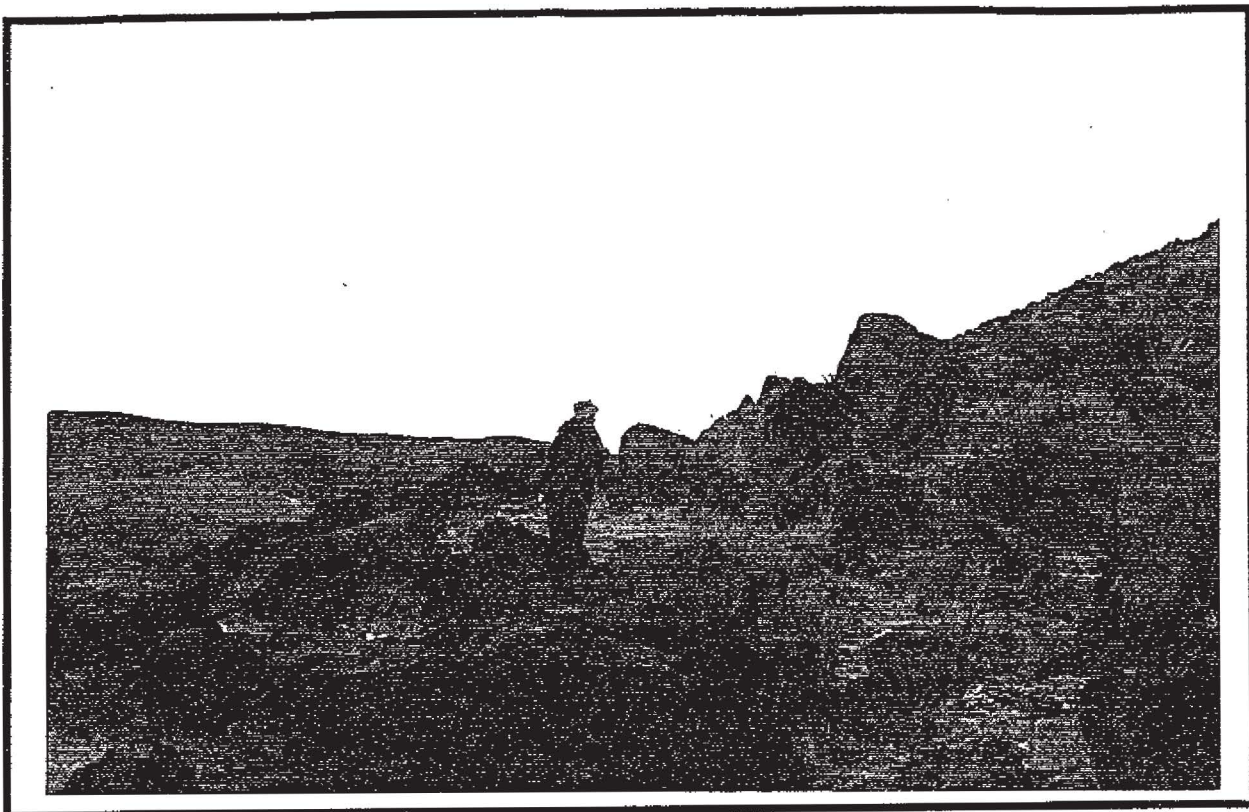
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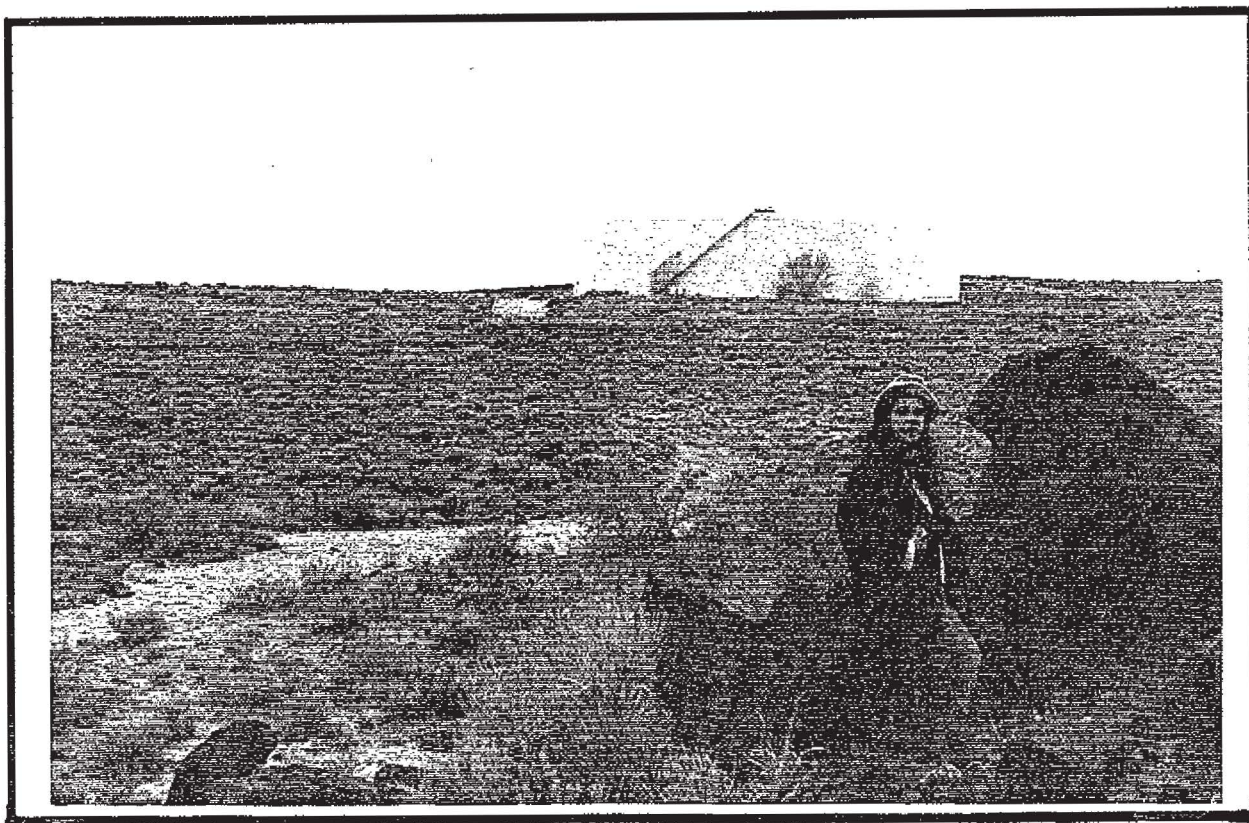
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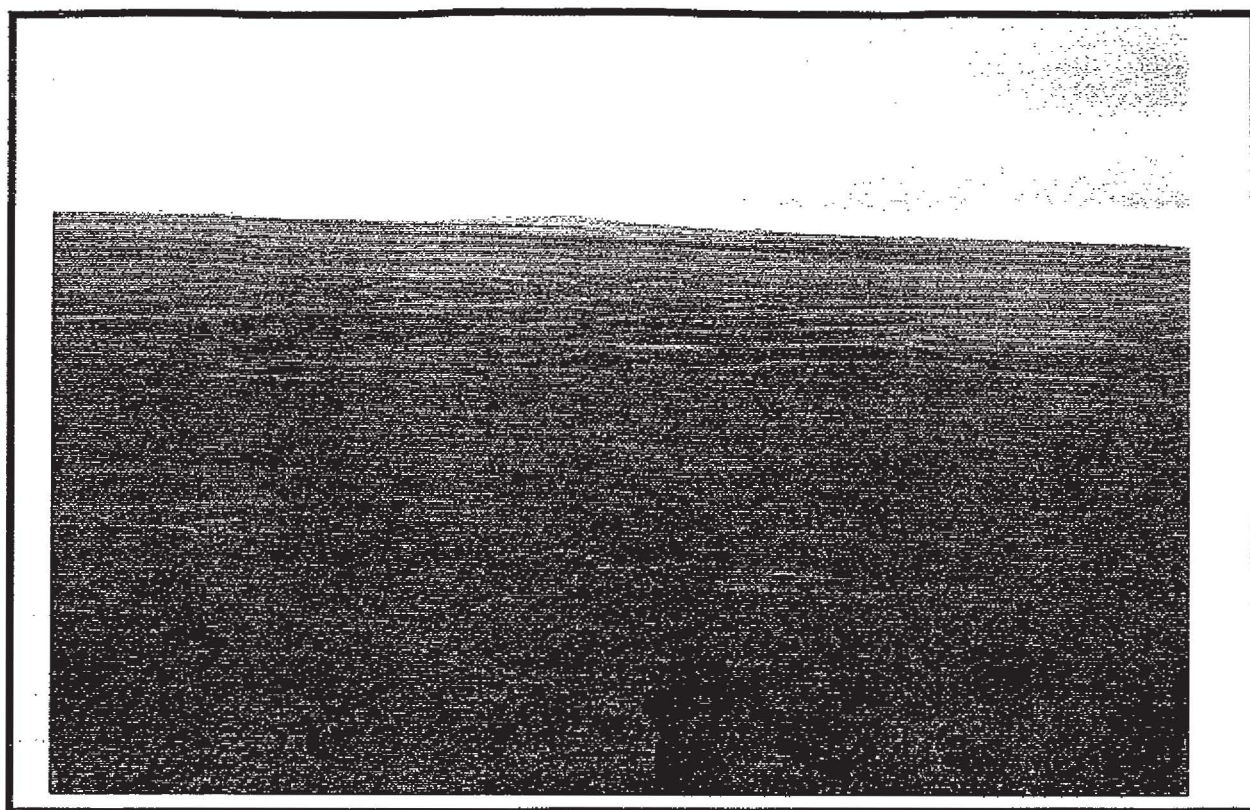
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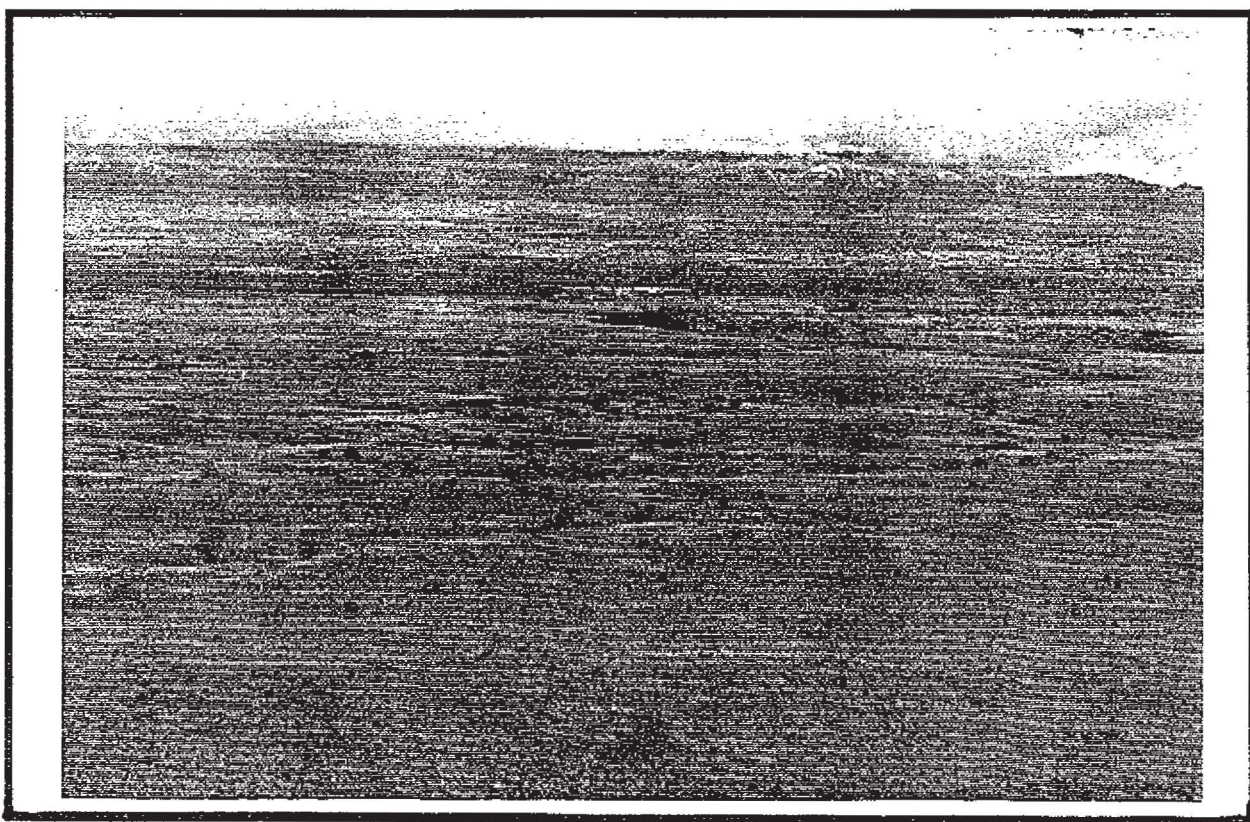
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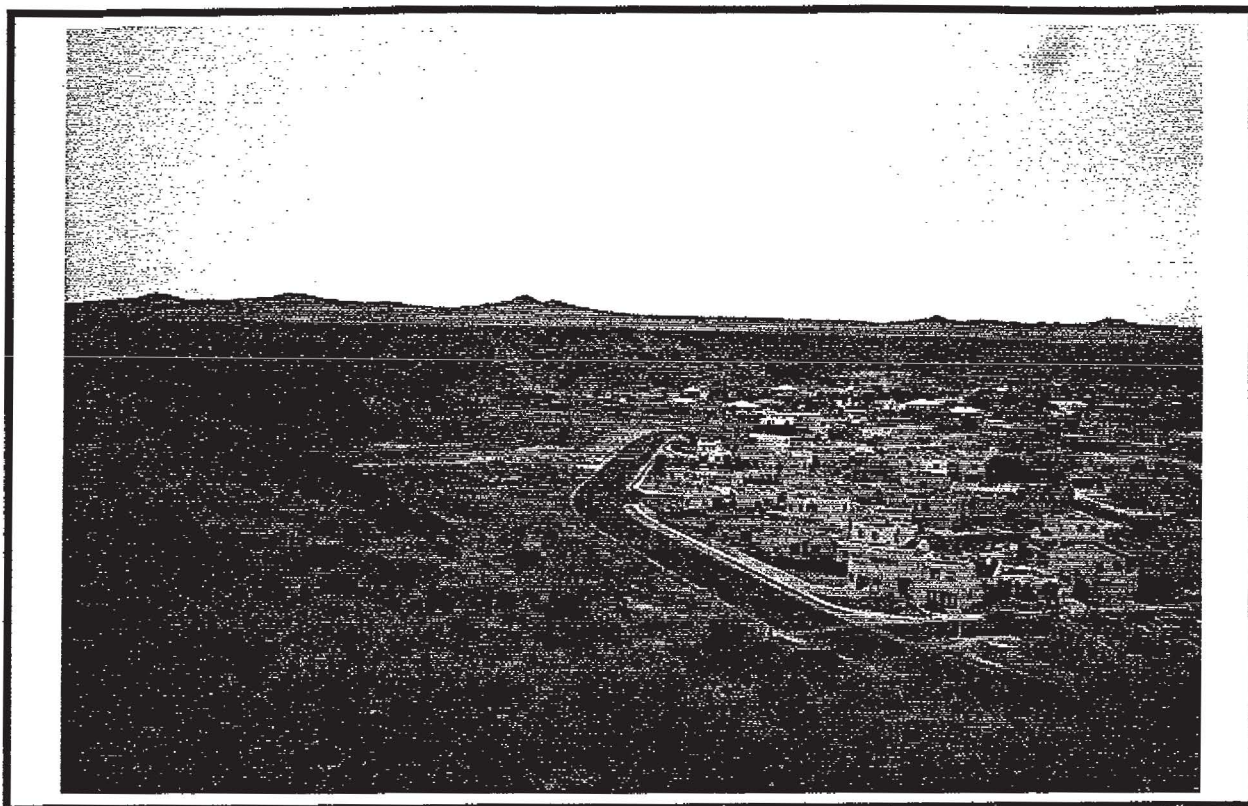
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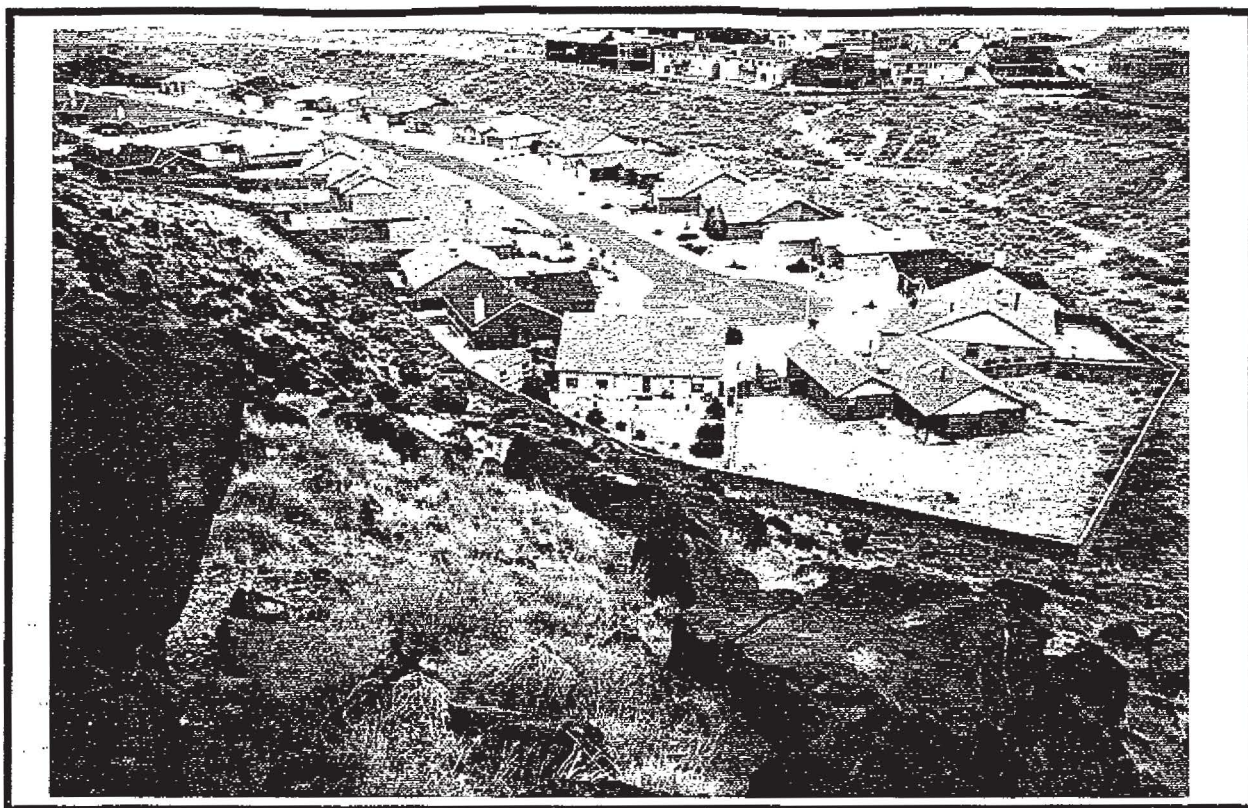
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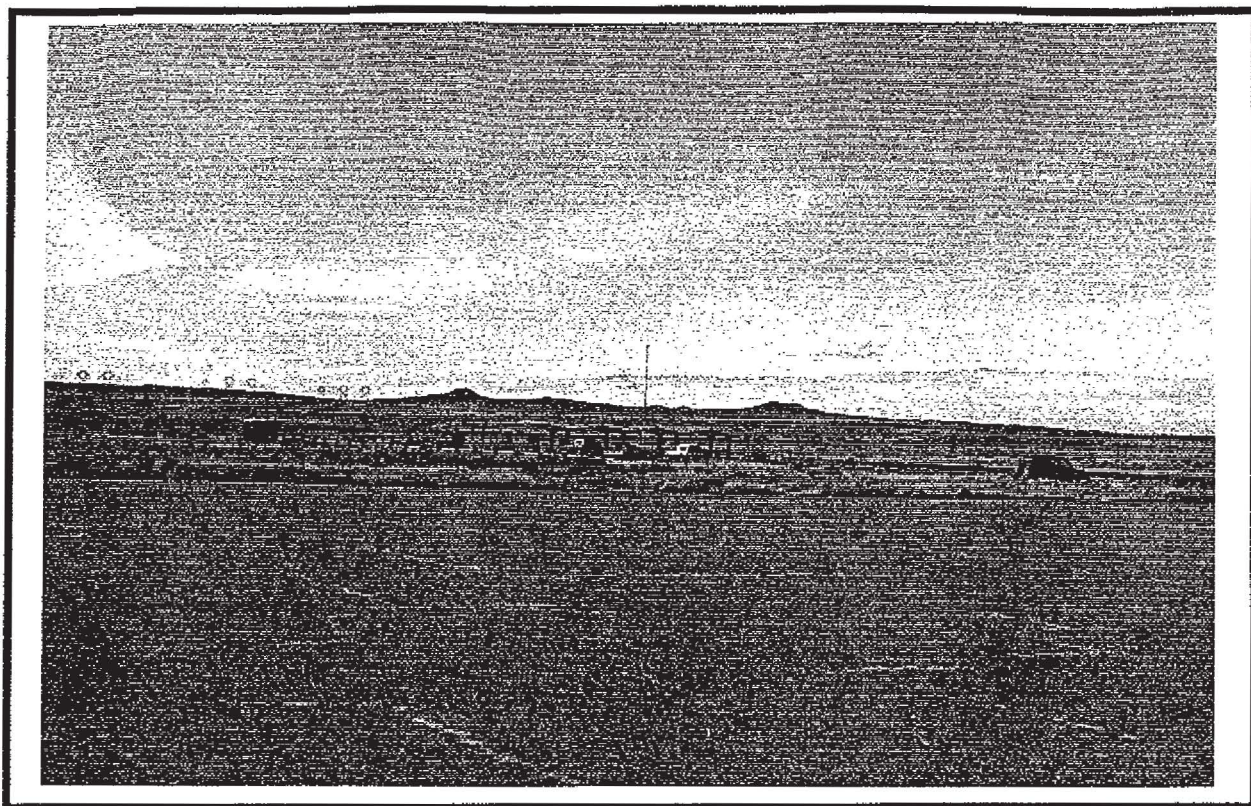
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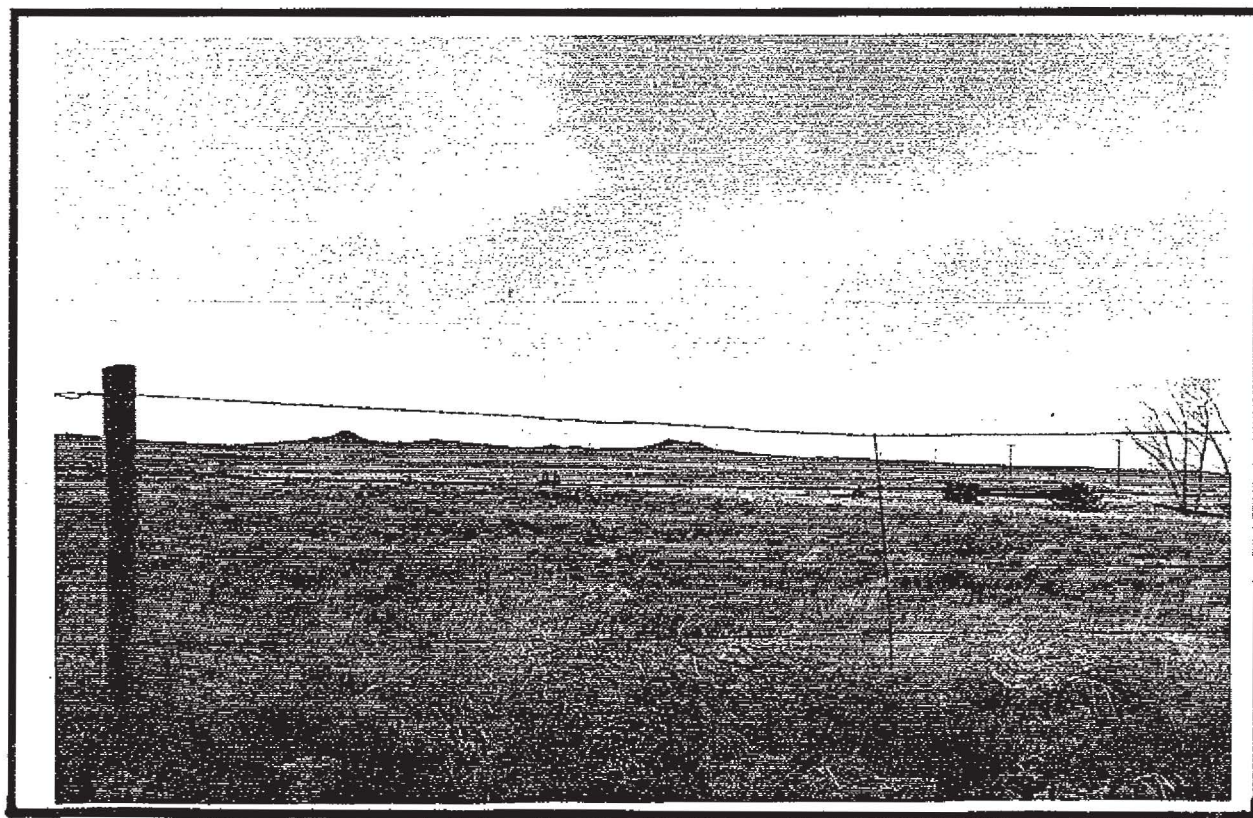
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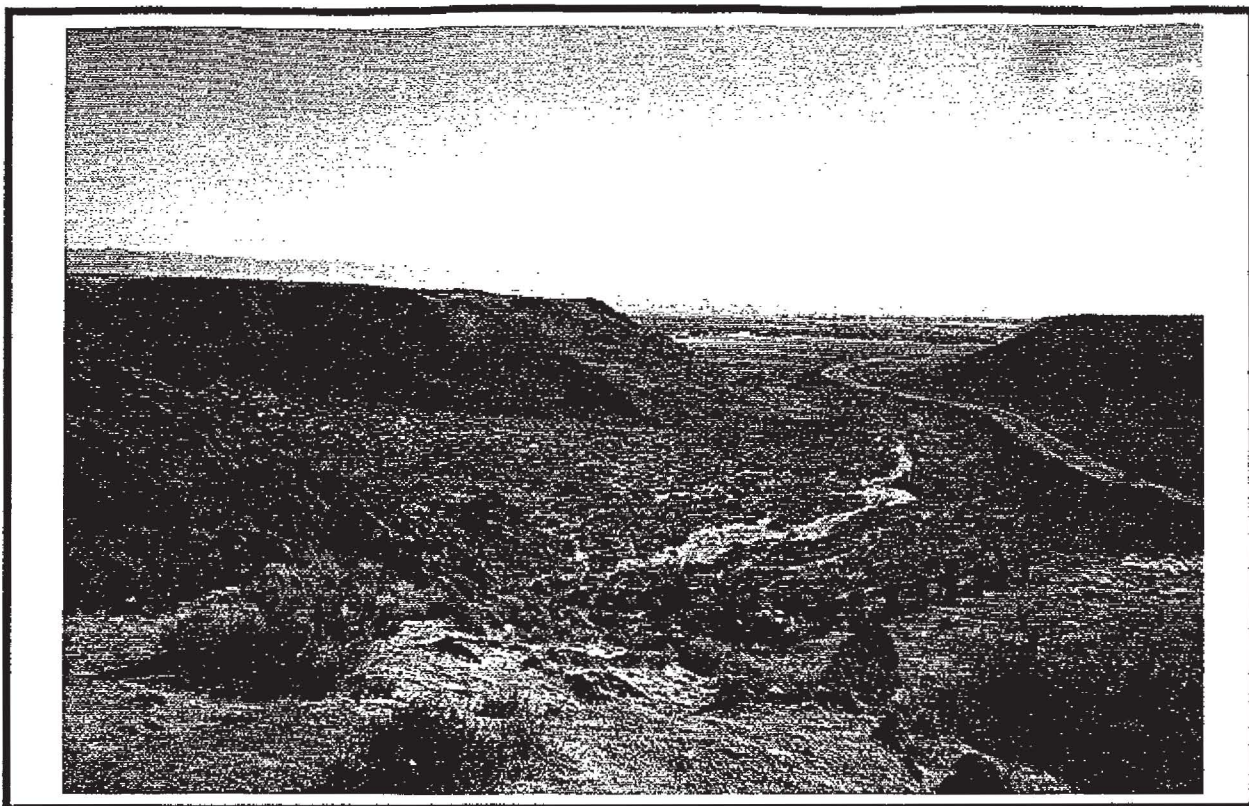
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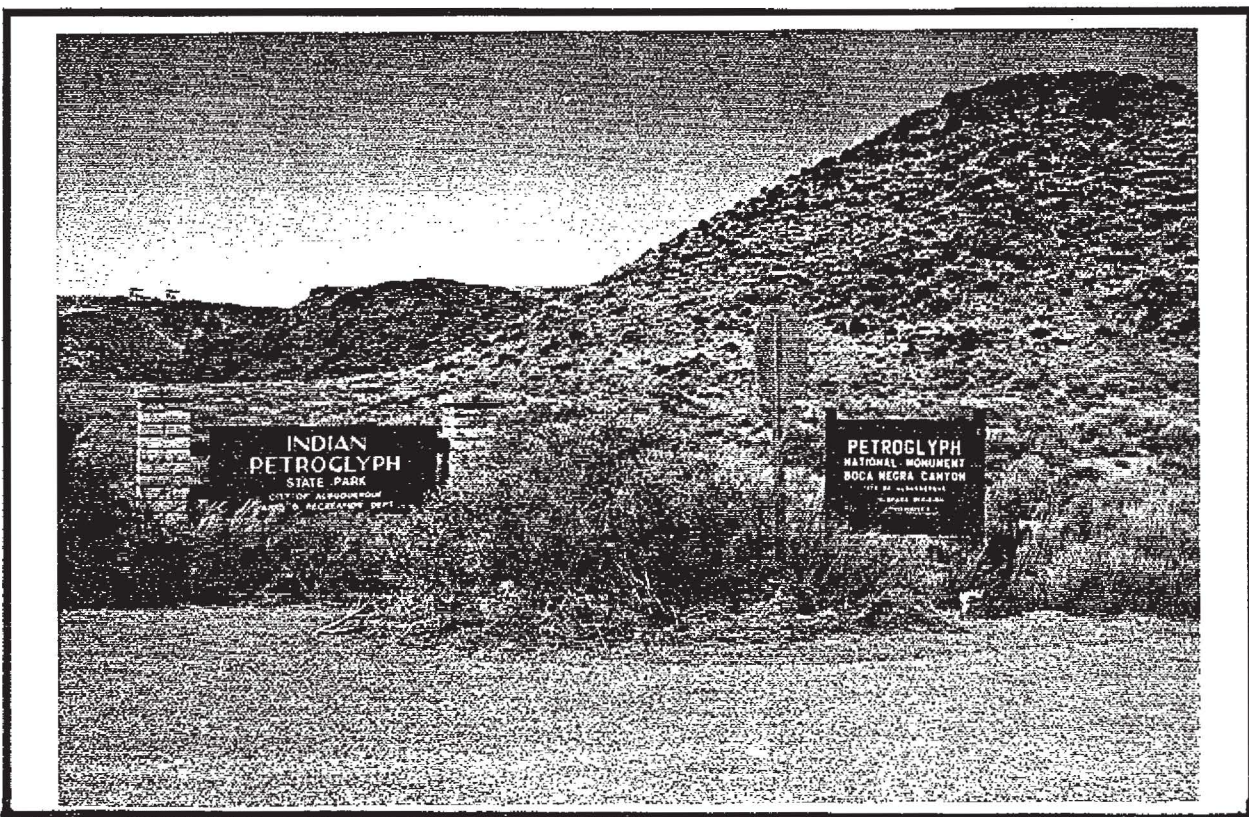
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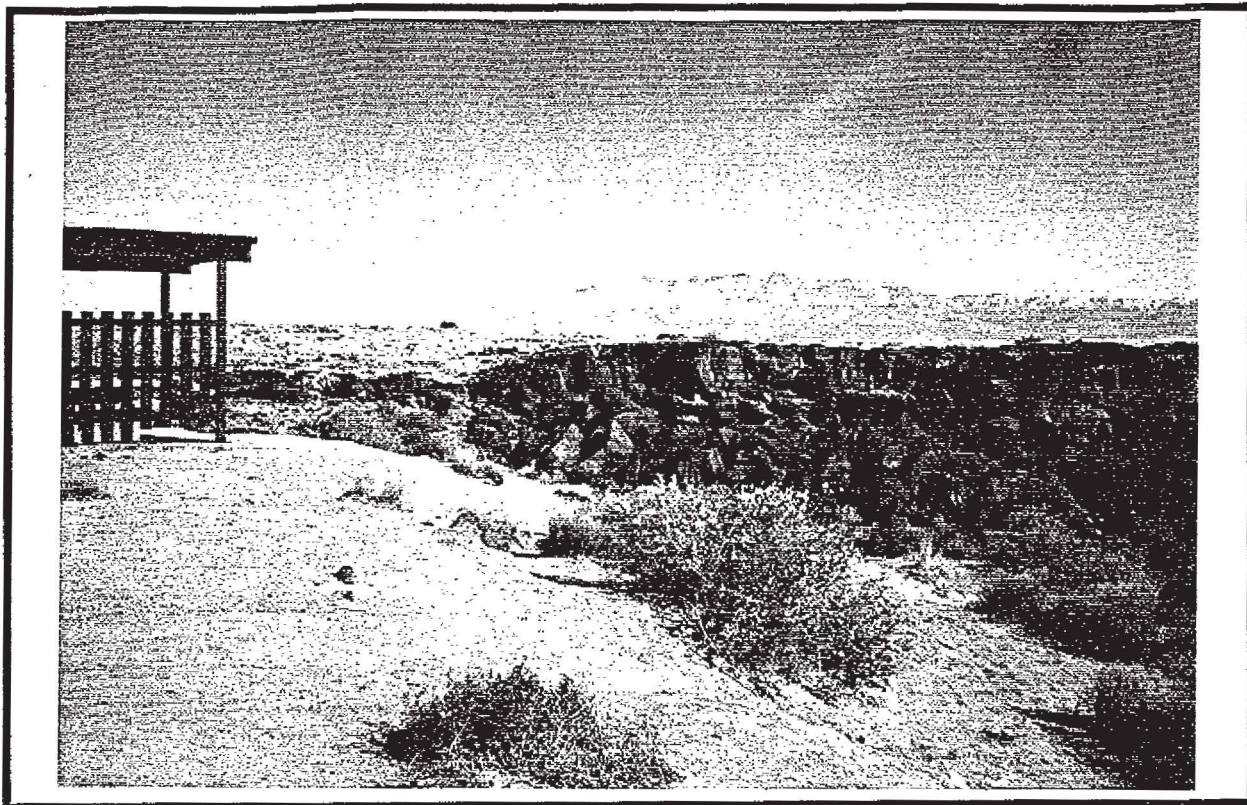
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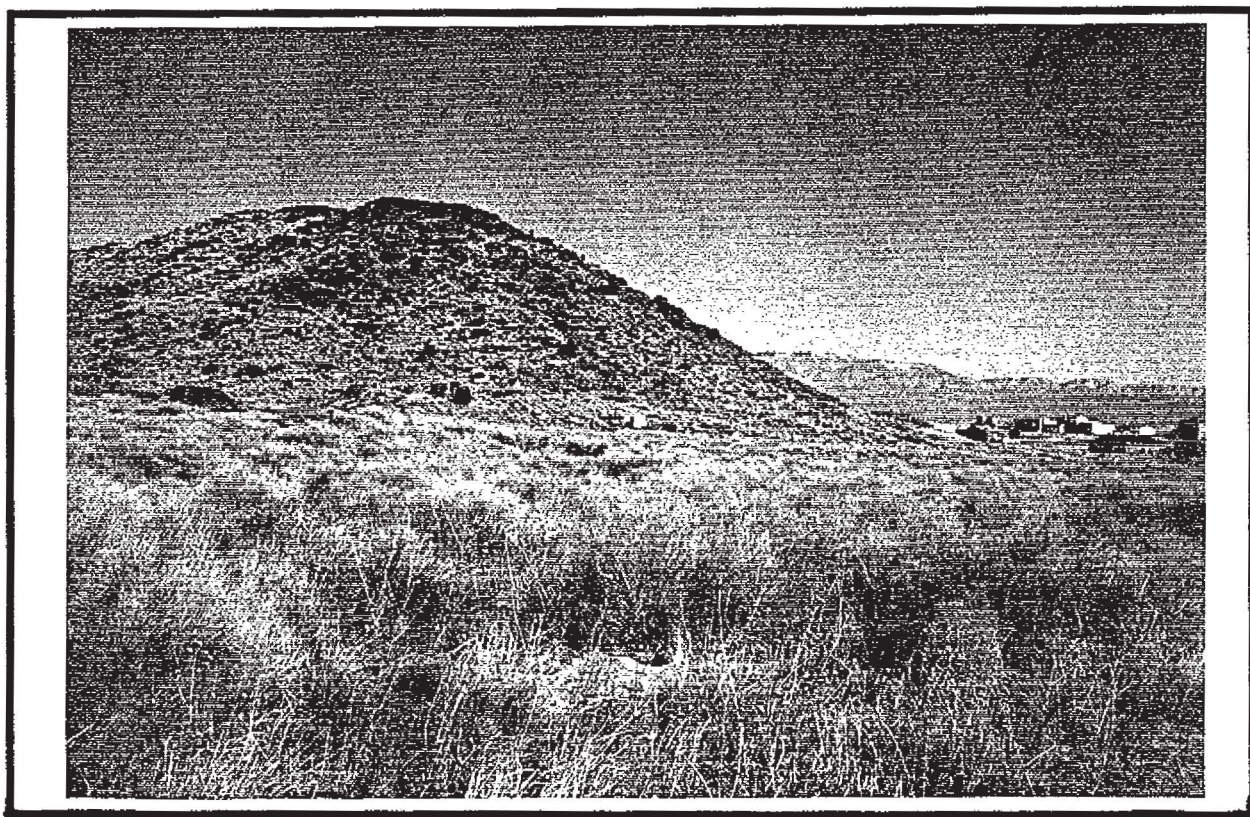
PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 27



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 28



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 29



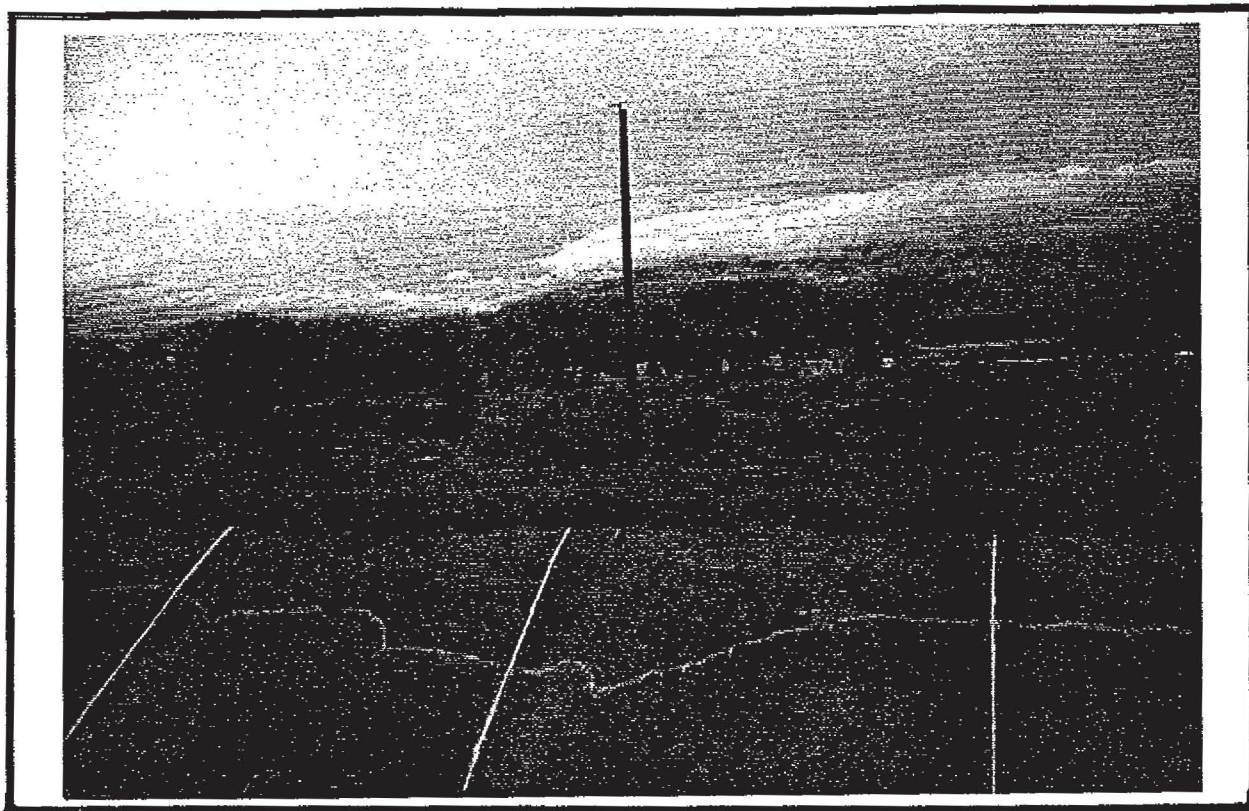
PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 30



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 31



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 32



PETROGLYPH VIEW MAP; PHOTOGRAPH NO. 33

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally-owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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