BLM EA # CA-016-97-009
BLM R/W SERIAL N. CACA 36964
DOE/EA - 1188

JOINT ENVIRONMENTAL ASSESSMENT FOR CHEVRON U.S.A., INC. AND SANTA FE ENERGY RESOURCES, INC.

MIDWAY VALLEY 3D SEISMIC PROJECT, KERN COUNTY, CALIFORNIA

OCTOBER 1996

U.S. DEPARTMENT OF ENERGY
NAVAL PETROLEUM RESERVES IN CALIFORNIA

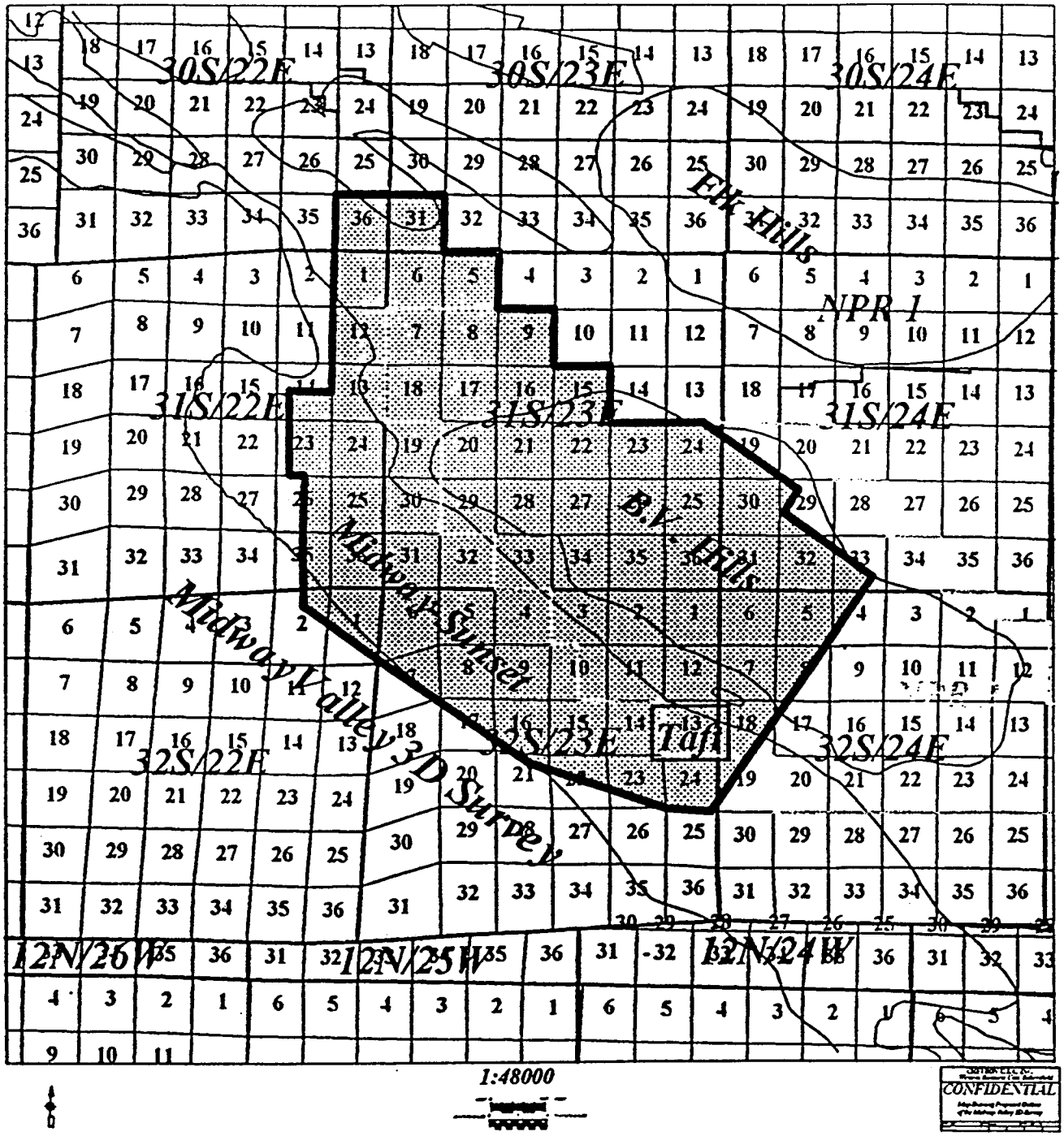
U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chevron/Santa Fe Midway Valley 3D Seismic Survey Project



INTRODUCTION

The proposed Midway Valley 3D Geophysical Exploration Project covers approximately 31,444 acres of private lands, 6,880 acres of Department of Energy Lands (DOE) within Naval Petroleum Reserve 2 (NPR2) and 3,840 acres of lands administered by the Bureau of Land Management (BLM), in western Kern County, California. A Biological Opinion for the proposed project has been rendered by the Acting Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Sacramento Field Office in Formal Section 7 Consultation with the Area Manager, Caliente Resource Area, U.S. Bureau of Land Management, Bakersfield, CA.

This environmental assessment (EA) presents an overview of the affected environment within the project area using results of a literature review of biological field surveys previously conducted within or adjacent to a proposed 3D seismic project. The purpose is to provide background information to identify potential and known locations of sensitive wildlife and special status plant species within the proposed seismic project area. Biological field surveys, following agency approved survey protocols, will be conducted during October through November 1996 to acquire current resource data to provide avoidance as the project is being implemented in the field.

The Midway Valley 3-D seismic project area is located in western Kern County, California. The approximately 66 square mile project area is bounded by the community of Derby Acres on its west-central border. The prospect includes the City of Taft along the southern boarder ranging north through the Buena Vista hills (NPR2) and northward across the Buena Vista Valley to the southern boundary of NPR1 (Elk Hills). The topography of the study area is generally flat from east to west, but rises into the Buena Vista Hills at its center.

Chevron U.S.A., Inc. and Santa Fe Energy Resources (Chevron/Santa Fe Energy) are proposing to conduct seismic investigations just southeast of the city of McKittrick and Derby Acres and in the Buena Vista and Midway Valleys, Kern County, California (Figure 1). Chevron/Santa Fe Energy's geophysical contractor will be Western Geophysical Corporation (Western Geophysical). In general, proposed seismic testing includes vibroseis using six truck equipped vibroseis units. All project related activities will be contained to existing roads and trails; cross country travel will occur only where roads and trails are not available, where sensitive resources can be avoided within the seismic corridors by vehicles, or where no listed resources occur within agency avoidance criteria within the 100 ft seismic corridor. Recording cables, geophones, and related equipment will be positioned over the project site while the project is in process.

Because the project is located in areas known to support populations of several threatened and endangered species a biological survey is necessary to meet criteria of the federal endangered species act (ESA) of 1976 as amended, and the California endangered species act (CESA). The biological survey and assessment are conducted to assess potential impacts of project related activities to threatened and endangered plant and animal species and to provide mitigation to lessen impacts to listed species and their habitat(s).

Figures 1 and 2 to be located here in Environmental Assessment Final

The proposed geophysical operation directly and indirectly will affect private and BLM and DOE land holdings. The proposed geophysical operation has the potential to adversely affect environmentally sensitive resources as defined in DOE's NEPA Implementing Procedures and Guidelines (57 FR 15122, April 24, 1992, codified in 10 CFR 1021). The geophysical operation may impact federally/state listed species and will minimally impact their habitat if mitigated properly.

Because the project is proposed to cross areas with natural lands (i.e., areas with valley saltbush scrub), the project has potential to impact populations of sensitive wildlife and special status plant species. Chevron/Santa Fe Energy and the Western Geophysical are required to insure that there are no adverse impacts to listed species in compliance with the California and Federal Endangered Species Acts, respectively (California Endangered Species Act of 1980, and the Federal ESA of 1973, as amended). Agencies, to include but not limited to, BLM, DOE, the California Department of Fish and Game (CDFG), and the U.S. Fish and Wildlife Service (USFWS), require biological surveys and assessments of project related impacts to sensitive species (defined below).

A literature review of previously conducted biological filed surveys within the project area or nearby vicinity (1 - 5 miles distant from the project area) was conducted. The purpose was to identify potential and known locations of sensitive wildlife species on the project site. to identify potential and known locations of sensitive wildlife species on the project site. The biological evaluation prepared by BLM (7/8/96) for the Chevron Belridge 3D seismic project was also reviewed and is incorporated by reference to this EA.

SCOPE

This environmental assessment addresses impacts resulting from seismic survey activities that will occur if the project is authorized by BLM and DOE. This includes the effects of the action on federal (DOE and BLM) lands, as well as certain impacts of these authorizations on private lands. Federal law requires the assessment of any interrelated and interdependent impacts (resulting from the federal authorization) to federally listed plant or animal species on private lands, as well as resulting dependent or integrally related impacts to cultural resources on private lands. The issue of all impacts to lands within the City of Taft, as well as other impacts to private lands, are deferred to local government and permitting authorities, and are not addressed in this document.

CONFORMANCE WITH APPLICABLE LAND USE PLAN

This proposed action falls within the Bureau of Land Management's Caliente Resource Management Plan (RMP) (approved September 1985). This plan has been reviewed to determine if the proposed action conforms with the land use plan, terms, and conditions as required by 43 CFR 1610.5-3(a).

This decision states"...areas will be managed to encourage exploration operations in a manner that recognizes sound reclamation practices, within the guidelines and constraints of pertinent federal, state, and local laws, regulations, and orders."

RELATIONSHIP TO STATUTES, REGULATIONS, AND OTHER PLANS:

Bureau of Land Management authorization for the geophysical operation on public land is consistent with regulations at 43 CFR 315.

This proposed action is covered within the draft Caliente Resource Management Plan (RMP) (approved 1995). This draft plan has been reviewed and the proposed action was found to be in full conformance.

The analysis in this document is intended to meet federal requirements. It is understood that requirements under State law, including CEQA, will be addressed by local permitting authorities including the City of Taft.

The proposed action and its analysis in this document conform with and meet the requirements of:

- Endangered Species Act (ESA) of 1973 (as amended)
- National Environmental Policy Act (NEPA) of 1969
- 43 CFR Part 3150
- National Historic Preservation Act of 1966, amended 1992
- 36 Code of Federal Regulations, Part 800
- Programmatic Agreement between Bureau of Land Management, the California State Historic Preservation Officer, and the Advisory Council of Historic Preservation (June 3, 1991).

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Chevron/Santa Fe Energy have proposed to conduct seismic investigations to obtain information about potential oil and gas deposits in the Midway Valley Area.

The proposed action requires the authorization from BLM and DOE for portions of the geophysical operation on federal lands (3,840 acres of BLM lands and 6,880 acres of DOE lands located within NPR2). Permits for land use and geophysical operation crossing were obtained by the seismic contractor for Chevron/Santa Fe Energy prior to project related field operations.

Given that Chevron and Santa Fe Energy are two of the largest oil field operators and land holders in the Midway Valley area, their joint approach to evaluation of acreage with 3D seismic data likely will result in a reduction in the number of future, separate, geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 NO-ACTION

Under the no-action alternative, the BLM and DOE would not allow seismic operations to be conducted on BLM and DOE lands. Therefore the seismic project area would be reduced in mineral and surface data acquisition and only involve private lands.

2.2 PROPOSED ACTION

The project is proposed in three stages. Phase 1 will consist of five to six 2-man survey teams deploying temporary pin flags along the source and receiver lines. Agency approved biologists and archaeologists will follow the surveyors and flag all areas where surface disturbing activities may affect listed wildlife and cultural resources. The biologists and archaeologists will recommend re-routes so that project vehicles can adhere to agency approved avoidance criteria for sensitive, or listed biological and cultural resources.

Phase 2 will consist of placement of geophones and data collection. The proposed project includes 34 lines of geophone and associated receiving cable, totaling 295 miles, and 52 source lines totaling 263 miles. Each source line segment will contain 8 shot points spaced 165 feet apart (1,320 feet per source line). Light-weight, four- wheel, all-terrain vehicles (ATVs) and four-wheel drive trucks will be used to transport, deploy, and pick up the recording equipment. Geophone trucks will be used for geophone deployment and retrieval. This action is proposed along the same geophone lines that the vibrator trucks will follow. ATVs will be used for all additional travel to service and repair recording equipment at all off-road locations. In some cases, deployment of recording equipment would be completed by hand. Six truck mounted vibroseis units spaced 2-5 ft apart will proceed in single file along source lines generating seismic energy near the 8,426 source points. The lead vibrator truck will stop one truck length past the source point, all trucks will lower their pads and vibrate for 18 seconds before moving forward approximately 7.5 ft to repeat the process. Each truck will lower its pad and vibrate 12 times at each source point. The collective vibrator pad depression at each source point has the potential to be 0-6 inches deep, 7 ft

wide, and 165 ft long. After completing vibroseis at all eight points along a source line segment, vibrator trucks will travel on the perpendicular geophone line for 1320 ft to reach the next set of eight source points and begin vibrating. The pads on the units are 7.25 ft. wide and 3.0 ft. long. All project vehicles, excluding vibrator trucks and vehicles deploying geophones, will be confined to existing roads except where practical. Phase 1 and Phase 2 would require a total of approximately 120 days to complete. The project is scheduled to begin in November of 1996 and should be completed by late February 1997.

Phase 3, project reclamation, will proceed concurrently with the completion of Phase 2 activities. All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications. BLM and DOE standard mitigation measures shall apply and are included as Appendix A. Phase III will be completed thirty days after conclusion of project.

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

Alternative locations to the proposed geophysical operation were considered during initial site selection. Such alternatives would require a request for larger surface area or a different seismic testing approach (large drilling trucks) thereby creating equal or greater potential impacts to endangered species habitat and cultural resources. The proponents decided not to pursue these options; further analysis was therefore dropped.

Chevron/Santa Fe Energy could confine the project scope to private lands. Under this alternative, Chevron would be required to obtain a Section 10a permit from the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973, as amended. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land.

3.0 AFFECTED ENVIRONMENT

3.1 PROPOSED ACTION

3.1.1 AIR QUALITY

Air quality in the Kern County region is considered marginal, with the San Joaquin Valley Air Basin being designated as a non-attainment area for two of the six criteria air pollutants (ozone and PM-10 [particulate matter less than 10 microns]) for which National Ambient Air Quality Standards (NAAQS) have been established. All activities are governed by an extensive air pollutant permitting and monitoring program operated by the San Joaquin Valley Unified Air Pollution Control District.

3.1.2 WATER RESOURCES

All surface water in the region can be characterized as dry wash run off from sparse rainfall in an arid environment. Total annual rainfall is approximately five to six inches per year, with about 70 percent of that occurring from December through March. Groundwater quality in the Buena Vista and Midway Valley areas varies considerably, with Total Dissolved Solids (TDS) levels ranging from 50 parts per million (ppm) in perched groundwater to over 2-3,000 ppm in certain unconfined aquifers. DOE/BLM EA-1124, May 1996 3D Seismic.

3.1.3 GEOLOGY AND SOILS

The site is currently characterized by relatively flat areas to rough rolling hills with numerous small drainages. The proposed project is occupied by the Lower Sonoran Grassland community (Twisselmann, 1967) and Valley saltbush scrub and non-native grassland habitats (Holland 1986) and is naturally subject to wind and water erosion. Areas directly impacted by the proposed action would be reclaimed and revegetated after completion of geophysical operations.

3.1.4 LAND USE

NPR-2 consists of approximately 38,000 acres and has been extensively used for petroleum extraction and processing since the early 1900's. Oil production, gathering, and processing currently are the predominant land uses within the boundaries of the site. It is anticipated that NPR-2 lands will be used for petroleum extraction and processing for several decades. Land uses in the area surrounding NPR-2 follow the general patterns found throughout Kern County, which are dominated by agriculture, livestock grazing, and oil and gas extraction and production. Surface and mineral rights on lands surrounding the site are owned primarily by major oil companies.

3.1.5 WASTE MANAGEMENT

Bureau of Land Management policy requires all hazardous wastes be removed from the site, should there be any, in accordance with all federal, state and local laws and regulations by a state certified hazardous waste transporter to a state permitted hazardous waste disposal/recycling facility. Solid sanitary wastes will be collected in bins and transported to the local municipal landfill.

3.1.6 BIOLOGICAL RESOURCES

For the purpose of this environmental assessment, the term "sensitive wildlife species" refers to taxa that are on the CDFG Special Animals List (CDFG 1994) in any of the following categories:

1. Federal Threatened and Endangered Species (USFWS 1989) that are protected by the Endangered Species Act (ESA 1973) as amended.

2. Federal candidate species (USFWS 1996) that are under review for listing as Endangered or Threatened. Although federal candidate species receive no statutory protection under ESA (1973), USFWS encourages federal agencies to take such taxa into account in environmental planning.

3. California State Threatened and Endangered Species (CDFG 1992), and California species of special concern (Remsen 1978, Williams 1986).

Sensitive wildlife species that potentially occur within and adjacent to the project area were identified (Table 1). Other sensitive wildlife species that may use the project site on an infrequent basis, i.e., during migration, are not included in this list.

Sensitive wildlife species and their sign (tracks, scats, etc.) that have been recorded within and adjacent to the project area and include: Blunt-nosed leopard lizards (*Gambelia silus* - sightings, tracks, scats and burrows), San Joaquin kit fox (*Vulpes vulpes macrotis* - telemetry study, mortalities, den surveys, tracks, scat, sightings, active dens), San Joaquin antelope squirrels (*Ammospermophilus nelsoni* - sightings, tracks, scats, and burrows), giant kangaroo rats (*Dipodomys ingens* - surveys, sightings, precincts, mortalities), short-nosed kangaroo rats (*Dipodomys nitratoides brevinasus* - trapped individuals, mortalities along roads, tracks, scats, and burrows), burrowing owl (*Athene cunicularia* - sightings, droppings, castings, burrows), loggerhead shrike (*Lanius ludovicianus* - sightings and nests), Le Conte's Thrasher (*Toxostoma lecontei* - sightings and nests) and short-eared owls (*Asio flammeus* - sightings).

Special status plants include species listed as threatened or endangered by the state of California or federal government and those species listed as List 1B plants by California Native Plant Society (CNPS) (Smith and Berg 1988). Table 2 presents special status plant species that have potential to occur at the project site. One listed special status plant species known to occur at the project site (additional CNPS plant species are presented in Table 2): Hoover's woolly-star (*Eriastrum hooveri*). Vegetation of the area is predominantly a sparse cover of red brome (*Bromus rubens*) and red-stemmed filaree (*Erodium cicutarium*). Saltbush (*Atriplex polycarpa*) is present along slopes and in washes and drainages in hillier areas. Cheesebush (*Hymenoclea salsola*) is the most abundant shrub in washes and flat sandy areas on the lower slopes. Other relatively common shrubs include bladderpod (*Isomeris arborea*) and matchweed (*Gutierrezia bracteata*).

Table 1. Sensitive wildlife species potentially occurring within the Chevron/Santa Fe Energy Company 3D Seismic Project, Kern County, California.

	STATUS	
	STATE[1]	FEDERAL[2]
REPTILES		
Blunt-nosed leopard lizard (*Gambelia silus*)	SE	FE
BIRDS		
Burrowing owl (*Athene cunicularia*)	CSC	-
Le Conte's thrasher (*Toxostoma lecontei*)	CSC	-
Loggerhead shrike (*Lanius ludovicianus*)	CSC	-
MAMMALS		
San Joaquin antelope squirrel (*Ammospermophilus nelsoni*)	ST	-
Giant kangaroo rat (*Dipodomys ingens*)	SE	FE
Short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*)	CSC	-
Tulare grasshopper mouse (*Onychomys torridus tularensis*)	CSC	-
San Joaquin kit fox (*Vulpes velox macrotis*)	ST	FE
American badger (*Taxidea taxus*)	CSC	-

1 SE Listed as Endangered by the State of California
ST Listed as Threatened bythe State of California
CSC California Department of Fish and Game "Species of Special Concern"

2 FE Listed as Endangered by the Federal Government

Table 2. Status, distribution, and habitat of special status plant species with potential to occur within the Chevron/Santa Fe Energy Company 3D Seismic Project, Kern County, California.

Species[1] Common Name[2]	USFWS Listing[3]	State Status[4]	CNPS Status[2]	Habitat Type[5]	Distribution by County[2]
Atriplex vallicola Lost Hills saltmat	None	None	2-2-3 List 1B	clay slicks	FRE KRN SLO
Caulanthus californicus Califomia jewelflower	Endangered	Endangered	3-3-3 List 1B	sandy grassland	FRE KNG * KRN SBA SLO TUL*
Delphinium gypsophilum ssp. *gypsophilum* gypsum larkspur	None	None	1-1-3 List 4	gypsum rich grassland soils	ALA CCA FRE KNG KRN MAD MER SJQ STA
Delphinium recurvatum recurved larkspur	None	None	1-2-3 List 1B	saltbush scrub, grassland	CCA COL FRE KNG KRN MER SLO SOL TUL
Eriastrum hooveri[6] Hoover's woolly-star	Threatened	None	1-2-3 List 1B	sandy saltbush scrub	FRE KRN SLO SBA
Eriastrum pluriflorum ssp. *sherman-hoyteae* small-stamen woolllystar	None	None	1-1-3 List 4	sandy grassland	LAX KRN
Eriogonum gossypinum cottony buckwheat	None	None	1-2-3 List 4	barren clay-sandstone	FRE KNG KRN SLO
Eriogonum temblorense Temblor buckwheat	None	None	1-1-3 List 4	barren clay-sandstone	KRN MNT SLO
Hemizonia pallida Kern tarplant	None	None	1-2-3 List 4	sparse grassland	KRN KNG
Hollisteria lanata hollisteria	None	None	1-2-3 List 4	saltbush scrub grassland	FRE KRN MER MNT SBA SLO
Lembertia congdonii San Joaquin woolly-threads	Endangered	None	3-2-3 List 1B	sandy grassland scrub	FRE* KNG KRN SBA SBT SLO TUL*
Nemacladus gracilis slender nemacladus	None	None	1-1-3 List 4	grassland	FRE KNG KRN MER
Trichostema ovatum San Joaquin blue-curls	None	None	1-2-3 List 4	grassland	FRE KNG KRN TUL

Notes:
1. Nomenclature corresponds to Kartesz and Kartesz (1980) with the exception of *Lembertia* (*Eatonella*) *congdonii* (Gray) Greene.
2. Smith and Berg (1988); counties abbreviated by a three letter code. Some county records are based on recent, unpublished information.
3. No federal candidate plant species are known to have distributions within the project area.
4. Section 1904, California Fish and Game Code (January 1989 listing) (CDFG 1989).
5. Twisselmann (1956, 1967), Munz and Keck (1968), Taylor and Davilla (1986), Smith and Berg (1988) Taylor (1987) and field observations.
6 This is the only listed plant species currently known to exist in the proposed project area.

* Presumed extinct in this county.

3.1.7 SOCIOECONOMIC IMPACTS

Short-term subcontractors will be used to perform the project management, cultural resource surveys, geophysical field work, and interruption of the seismic data, which will provide an

incremental economic benefit to the local economy.

The seismic operation would require two crews consisting of a recording/geophone cable lay-out crew made up of 25-30 workers at peak lay-out operations and a vibroseis crew consisting of six trucks and one mechanic's support truck (7 persons). The operation is temporary and once the data acquisition is completed no permanent jobs will be added. The proposed action would not increase the local population permanently, or have an adverse impact on housing, public services, or local infrastructure. The local economy would realize a short term, positive impact from expenditures for locally available services, equipment, and supplies.

3.1.8 CULTURAL RESOURCES

European contact in the San Joaquin Valley was first recorded in 1772 when Spanish soldiers traveled through Tejon Pass into the valley. A few years later in 1776 Francisco Garces arrived in the area. Later attempts by the Catholic church to establish missions in the area failed. In the middle to latter part of the 1800s there was significant development of agriculture in the valley. In addition, exploitation of the petroleum industry in the San Joaquin Valley was underway as early as the 1864. To present day both the agricultural and petroleum industry play a major economic role in the San Joaquin Valley.

The indigenous groups that occupied the San Joaquin Valley region during the ethnographic period were the Yokuts. At one time there were approximately 50 to 60 tribal groups of Yokuts dispersed through the Central Valley and adjacent foothills. The Yokuts were divided into three geographic divisions, the Northern, the Foothill, and the Southern Valley Yokuts. The region around the project area was occupied by a Southern Valley Yokuts tribal group known as the Tulumne (Latta, 1977).

Prehistory of Native American groups in the southern San Joaquin Valley covered thousands of years. Indeed archaeological evidence of prehistoric use in the area spans a period of about 9,000 years. Introduction of the historic period in this region began when the Spanish lead an expedition into the valley in 1772.

An archival record search at the San Joaquin Valley Information Center, California State University Bakersfield, identified 132 recorded archaeological sites within the boundary of the seismic project. Of these cultural properties, six are prehistoric sites and the remaining 110 sites are historic in age. Most of the historic sites are associated with oil and gas exploration and development. Until the precise geophysical source and receiver lines are identified on the ground, it is unknown if any cultural properties will fall within the proposed use corridors.

With implementation of the mitigation measures to avoid all cultural resources properties during seismic operations, no disturbance or impacts to cultural resources are anticipated. Refer to mitigation section. The beneficial effect of the proposed action would result in the compilation of additional cultural information through the discovery and recordation of archaeological resources in a area lacking adequate baseline data.

In regard to Native American traditional lifeway values which may be associated with lands involved on this project, the BLM has requested the views of the Native American community. BLM is currently not aware of any cultural or religious Native American concerns associated with the project area. No comments were received from the Native Americans.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

4.1 PROPOSED ACTION

Impacts of the proposed action would be similar to those for other geophysical operations such as the Chevron Belridge 3D seismic project conducted in the Lokern area (BioEnvironmental Associates 1993, BioSystems 1991, USFWS 1993) on private lands and government lands managed by the BLM. The primary environmental impacts caused by the proposed action would be surface disturbance associated with the seismic data acquisition phase of the project. Detailed potential impacts are presented below. Potential environmental impacts have been identified in Table 4.1 and are further described in the following sections.

TABLE 4.1
ENVIRONMENTAL IMPACTS

Critical Element	Affected		Critical Element	Affected	
	Yes	No		Yes	No
Air Quality		✓	T & E Species		✓
ACECs		✓	Wastes, Hazardous/Solid		✓
Cultural Resources		✓	Water Quality		✓
Farmlands, Prime/Unique		✓	Wetlands/Riparian Zones		✓
Floodplains		✓	Wild & Scenic Rivers		✓
Nat. Amer. Concerns		✓	Wilderness		✓

The seismic prospect is proposed over an approximate 65.88 square-mile area (42,164 acres). The project area is composed of valley saltbush scrub and non-native grassland vegetation.

The proposed project includes 34 lines of geophone and associated receiving cable, totaling 295 miles, and 52 source lines totaling 263 miles. Each source line segment will contain 8 shot points spaced 165 feet apart (1,320 feet per source line). If the Midway Valley 3D seismic project is implemented as planned, a maximum of 231 acres may be temporarily impacted by vibroseis pad compaction (8,426 source points x 165 feet x 7.25 pad width/43,560 ft^2 per acre). However, Chevron/Santa Fe Energy anticipates repeating the vibroseis process more than one time at certain source points to collect data from adjacent points ("stacking") to avoid sensitive biological and cultural resources, oil wells and pipelines.

Additionally, numerous oil field roads exist in the project area along which source points may be positioned. Because of this, and the fact that a portion of the project covers city streets in Taft, Chevron/Santa Fe Energy estimates that up to 20% of the source points either will not be "vibed" at all, or may be placed on roads and streets. This could result in roughly 185 acres of vibroseis pad disturbance (231 total potential acres x 80% = 185 acres actually disturbed).

In addition to vibrator pad disturbance, vibroseis truck tire width that exceeds the pad width could result in an additional 24 acres of tire compaction disturbance (8,426 source points x 165 feet x 0.75/43,560 ft^2 per acre) which also may take place along source lines.

If all geophone lines receive some portion of the vibroseis truck travel, an additional 121 acres may be temporarily impacted by off-road vehicle traffic (3.75 foot combined tire width x 8,426 geophone line segments x 165 feet per segment/43,560 ft^2 per acre = 121 acres). Approximately 25% (30 acres) of the 121 acres will not be driven on because the proposed "offset brick" travel pattern will result in some segments of the geophone lines remaining untraveled. Therefore, if vibroseis truck travel along the geophone lines occurs as planned, approximately 91 acres will be impacted by vibroseis truck travel. However, these segments already will have been traveled by the geophone deploying vehicles.

Vehicles deploying geophones will use approved travel paths within the 50 foot wide travel corridor along geophone lines. An additional 16 acres may be temporarily disturbed by vehicles deploying geophones along geophone lines not disturbed by vibroseis truck travel (2 foot 4-wheel drive tire width x 8,426 geophone line segments x 165 feet per segment x 25% undriven segment portions/43,560 ft^2 per acre = 16 acres).

Finally, to enhance data acquisition in the Midway-Sunset oil field, 4 additional geophone lines will be placed halfway between the standard geophone lines which are spaced 1,320 feet apart. Unlike the 30 standard geophone phones in the survey, these additional 4 lines will not be traversed by vibrator trucks during acquisition. Moreover, because the 4 lines are to be located in the Midway-Sunset field area, reduced cross-country travel is anticipated for geophone deployment trucks laying out the 4 lines due to the presence of numerous oil field roads.

The seismic prospect is proposed over an approximate 65.88 square-mile (42,164 acres).

4.1.1 AIR QUALITY

All emissions generated by geophysical operation activities for the proposed project would be of temporary duration and minimal in amount. Construction of access roads are not required for the proposed action. Site access will be accomplished by project related vehicles using existing trails and roads and pre-flagged cross country routes after the biological and archeological preactivity surveys, therefore minimal atmospheric emissions of particulate matter (PM-10) in the form of fugitive dust from cross country travel, vibroseis activities, and vehicle exhaust should result. Vehicle traffic is expected to increase by an estimated 10 vehicles per day (including ATVs) for a period of approximately 25 days, which includes transportation of geophysical workers to and from the site. Gaseous emissions from the internal combustion engines of project related vehicles and equipment would include oxides of sulfur (SO_x), oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC). Emissions from geophysical related activities would be localized and limited to about a one month period, and changes in ambient levels of PM, SO_x, NO_x, CO, and VOC would be minimal. No permits are required for the proposed action.

4.1.2 WATER RESOURCES

Cross country travel of geophysical operations is not expected to negatively impact surface water resources, as all impacts would be minor and temporary in nature. If there are significant areas of disturbance, these areas will be stabilized and revegetated to prevent erosion.

4.1.3 GEOLOGY AND SOILS

There would be no impacts to the geologic structure of the area from the proposed action. Negative impacts to soil on the proposed project site would be of short-term duration and created principally from surface disturbance during geophysical testing activities, which may increase erosion slightly.

4.1.4 LAND USE

The seismic data acquisition over the proposed project area would require that approximately 6,880 acres of the public lands in NPR-2 be used as temporary cross country travel areas, which is consistent with existing land uses on and adjacent to NPR-2 as long as potential impacts to the natural environment are mitigated properly. Thus, no direct adverse impacts to land use are anticipated.

4.1.5 WASTE MANAGEMENT

In general, the waste stream and by-products associated with the proposed project would be minimal. However, wooden stakes, flagging, pin flags, and surveyors paints will be used to mark travel routes and to identify the project in the field. Small amounts of items such as vehicle lubricating and hydraulic oils may be used during the project operation for routine maintenance of the project vehicles and some these substances are subject to RCRA hazardous waste regulations.

Any hazardous wastes resulting from project related activities and routine operation of the vehicles would be removed from the project area in accordance with all Federal, State and local laws and regulations with subsequent removal and disposal by a RCRA-licensed-carrier to one of several RCRA permitted hazardous waste facilities.

The project would create small amounts of nonhazardous solid waste (described above) and debris that would be collected for subsequent removal to an approved Class III facility (municipal landfill).

4.1.6 ECOLOGICAL IMPACTS

Any ecological impacts of the proposed action would be created by the direct and indirect impacts to sensitive wildlife and special status plant species and are described below.

Because similar geophysical recording and testing techniques are proposed for the Midway Valley 3D seismic project, the following analysis of impacts section is adapted and modified from BioEnvironmental Associates (1993) that was presented for the Chevron Belridge 3D seismic project that was conducted within the Lokern area.

Effects of the Proposed Project on Listed Plants

The greatest adverse impacts of the proposed project on listed plants would occur as a result of the compaction of soils beneath vibroseis pads. There are numerous sites of *Eriastrum hooveri* documented in the Elk Hills region and on the alluvium on the east side of the Buena Vista Valley. The project skirts this habitat in the northeast portions of sections 31 T30S, R22E, and sections 5, 9, 15, and 23 in T32S and R23E (R. Lewis, pers. comm.). There is potential for unknown sites in the Buena Vista Hills, but no sites have been documented.

In dry soils the effects of compaction are restricted to the first 4-5 inches (BioEnvironmental Associates, 1993). The effects of compaction of wet saturated soils are observed to a depth of 2-3 feet, which can severely damage the root zones of annual plants (Ibid). Compacting wet soils also lowers permeability so severely that water runs off of the compacted surface to adjoining areas and has adverse effects on annual plant growth in the immediate area of the compaction (Ibid).

Geophysical activity appears to have little effect on annual plants growing in source and geophone line corridors. It is unlikely that 3D seismic survey impacts, including access to source, placement of geophone lines, or subsequent collection of geophone lines would significantly affect the resident seed bank of the listed plants as long as the project is carried out as described, and after Hoover's woolly-star seed shatter, and while soil is dry. The pre-vibrosizing phase of the project will be completed before germination. Avoidance of known Hoover's woolly-star locations will be made during vibroseis operations. Eriastrum skeletons indicate occupied habitat for the species. Such areas will be cleared prior to vibroseis and will be given 50 foot avoidance zones of any surface disturbing activity.

The Midway Valley 3D seismic survey incorporates a number of project features that will minimize the effects of surface disturbance and soil compaction on listed plants. Localized effects likely would be detectable in post-project monitoring for some time, and strict adherence to disturbance minimizing procedures is of the utmost importance to maintain habitat quality for listed plants, including microflora and organic matter cover. In consideration of all of the mitigation procedures implemented, it is unlikely that project impacts would significantly impair or preclude the long-term persistence of Hoover's woolly-star on the site.

Effects of the Proposed Project on Listed Wildlife.

Chevron/Santa Fe Energy's Midway Valley 3D seismic project will occur during the months of November 1996 through February 1997, thereby avoiding the more environmentally sensitive spring months.

Individual kit foxes, blunt-nosed leopard lizards, giant kangaroo rats, and San Joaquin antelope squirrels may be injured or killed by vehicle strikes as a result of vehicles moving through the project area. However, the likelihood for this type of mortality is relatively low for kit foxes and giant kangaroo rats because of their nocturnal habits and the fact that the seismic testing will be conducted during daylight hours. Burrows and dens will be avoided. Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset. This activity may include significant vehicle travel.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Blunt-nosed leopard lizard impacts will be minimized using the following measures:

Check surrounding land uses and disturbance for suitable leopard lizard habitat, and

a. Check percent slope, and
b. Check vegetation density, and
c. Check availability of burrows for refuge

Individual kit foxes, blunt-nosed leopard lizards, giant kangaroo rats, and antelope squirrels also may be subject to injury or mortality through accidental entombment in collapsed dens or burrows as a result of vehicle traffic or from ground vibration or compaction caused by the vibroseis trucks. However, recent post-3D follow-up survey information collected from Chevron's Belridge 3D seismic project suggests that small mammal habitats may be negligibly affected by the impacts of 3D seismic activities. Data indicate no long-term impact on habitat use by burrowing rodents within approximately 6 months of completion of a 3D seismic vibroseis project and "...the impacts associated with the activity appear to have had some positive effects on burrow construction by the small mammal community. Moreover, it appears that relatively loose soil along cross country travel paths created by seismic trucks used for geophone and source lines (excluding the bottom of the vibrator pad depression) may have been especially attractive to burrowing rodents *(BioEnvironmental Associates, 1995)."* Seismic activity will occur early in the

San Joaquin kit fox breeding cycle, thus minimizing the potential for entombment of this species. In addition, relevant, pre-existing listed-species sighting information (e.g. BLM and DOE data) will be used to mitigate the potential for entombment. That information will be used in conjunction with information collected during Phase 1 survey activities.

San Joaquin kit foxes, blunt-nosed leopard lizards, giant kangaroo rats and antelope squirrels may indirectly be affected by the proposed action through temporary loss or degradation of habitat. Such loss or degradation could result from ground compaction and crushing of vegetation by trucks. However, the preactivity surveys will avoid these features to the greatest extent possible and thus, inadvertent destruction of kit fox dens and giant kangaroo rat burrows that could result in a net reduction of habitat used by these species for shelter, reproduction, and escape cover will be minimized. Kit foxes, leopard lizards and giant kangaroo rats may escape direct injury if dens and burrows are destroyed, but become displaced into adjacent areas. These animals may be vulnerable to increased predation, exposure, or stress through disorientation and loss of shelter. Moreover, these impacts will be negligible with the implementation of the project mitigations.

Section 9 of the Endangered Species Act of 1969 prohibits any taking (i.e., to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct) of listed fish or wildlife species without special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of section 7 (b) (4) and 7 (o) (2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking providing that such taking is in compliance with this incidental take statement. The reasonable and prudent measures described below are non-discretionary and must be undertaken by the agency, the applicant, or made a binding condition of any grant or permit issued to the applicant, as appropriate. The U.S. Fish and Wildlife Service (the Service) anticipates that San Joaquin kit foxes, blunt-nosed leopard lizards, giant kangaroo rats and San Joaquin antelope squirrels may be taken incidentally during the proposed Midway Valley 3D seismic survey. Project actions that may result in mortality, harm, or harassment of these species have been discussed previously in this environmental assessment. Mitigation measures proposed by Chevron/Santa Fe Energy subsequently will reduce, but not eliminate the potential for incidental taking of these species during the project (see Appendix A).

Section 9 of the Endangered Species Act of 1969 does not prohibit the incidental take of listed plant species. Protection of listed plants is provided, however, as the Act requires a Federal permit for removal or reduction, or possession of endangered or threatened plants from areas under Federal jurisdiction,, and prohibits malicious damage or destruction of any such species on any such area, or any act that would remove, cut, dig up, damage or destroy any such species on any other area in knowing violation of any state law or regulation or in violation of a state criminal trespass law. It is anticipated that because of the November to February activity of this project, impacts will be greatly lessened to sensitive plant species, their seed stock and listed wildlife species.

As a point of clarification and to avoid confusion, it is stipulated that incidental take resulting from this project only will be counted against the incidental take limits of this project and not to any other project previously reviewed for which an incidental take limit was established.

Based upon the foregoing, the Service anticipates that during the proposed Midway valley 3D seismic survey, no more than 1 San Joaquin kit fox, an unspecified number of blunt-nosed leopard lizards, and 1 giant kangaroo rat may be subject to harm or mortality during project related actions. No estimates were given for the California State-threatened San Joaquin antelope squirrel. The Service anticipated, however, that the actual number of animals subject to harm or mortality as a result of project actions (especially burrow collapses) will be difficult to determine because of the cryptic nature of this species and because of recent (1995) data that suggests benefits from seismic activities. Therefore, the Service specified the following incidental take limits for disturbance of dens and burrows during project activities, no more than 2 known San Joaquin kit fox dens, an unspecified number of known blunt-nosed leopard lizard burrows, an unspecified number of active giant kangaroo rat precincts, and numerous (but unqualified) active burrows of other kangaroo rats will be subject to visible destruction or damage during project related activities.

The Service considered the number of animals subject to harassment from noise, vibrations, and human activity during the project to be impractical to estimate. The Service authorized harassment of all federally listed wildlife species inhabiting the project area and adjacent areas, provided that any such harassment was a result of strictly required project activities ; that it was inadvertent; and that all terms and conditions were fully implemented (see Appendix A).

Kit foxes, leopard lizards, giant kangaroo rats and San Joaquin antelope squirrels inhabiting the project area also may be subject to harassment while the project is being conducted. Such harassment may result from displacement of animals to adjacent areas if dens and burrows are destroyed, and from ground vibrations caused by heavy trucks. This displacement is temporary and intermittent over a four month period.

Long-term Effects of the Proposed Project on All Listed Species.

The proposed Midway Valley 3D seismic project could have certain long-term effects within the Midway Valley area. For purposes of this EA, long-term effects are defined as those that would persist 5 years or more after completion of actual survey activities.

Long-term effects primarily would include inadvertent road development and possible future oil production activities in the project area. The former may arise as a result of unauthorized vehicle use of the ground "tracks" left behind by survey vehicles. Such tracks are an attraction to recreational and casual vehicle users and sometimes become *de facto* secondary roads if they are used repeatedly. However, such impacts have not been noted following the Belridge 3D project which occurred in the adjacent Lokern Area in 1993/94. The latter may result if Chevron/Santa Fe Energy identifies recoverable hydrocarbon reserves as a result of the proposed survey and wishes to develop such reserves. This would result in the construction of exploration and production

wells, tank settings, pipelines and other infrastructure associated with active oil fields. Together, these two factors could contribute to long-term habitat degradation within the Midway valley area; however, such effects likely will be addressed and permitted under the Kern County Valley Floor HCP process and/or other federal permitting programs.

Given that Chevron and Santa Fe Energy are two of the largest oil field operators/land holders in the Midway valley area, their joint approach to evaluating acreage with 3D seismic data likely could result in a reduction of the number of future, separate geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

4.1.7 CULTURAL RESOURCES

Until the precise geophysical source and receiver lines are identified on the ground, it is unknown if any cultural properties will fall within the proposed use corridors. With implementation of the mitigation measures to avoid all cultural resources properties during seismic operations, no disturbance or impacts to cultural resources are anticipated. Refer to mitigation section. The beneficial effect of the proposed action would result in the compilation of additional cultural information through the discovery and recordation of archaeological resources in a area lacking adequate baseline data.

4.1.8 FLOODPLAIN AND WETLANDS

The proposed project is located above the 100 year floodplain. No wetlands would be affected by the seismic operation.

4.1.9 NOISE

During seismic operations ambient noise levels would experience minor increases. Because of the remote location of the proposed action, off-site perception of ambient changes in noise levels is not expected. No long-term noise effects are anticipated from the proposed action. No known sensitive receptors exist adjacent to or within the project area.

4.1.10 OCCUPATIONAL HEALTH AND SAFETY

Negative impacts to occupational health and safety are not anticipated as a result of the proposed action. Any potential exposure of workers to hazards from chemical substances or physical agents would be minimized using a combination of engineering controls, work practices and procedures, and personal protective equipment while conducting seismic operations in oil fields and remote sites. Training programs are in place and implemented to ensure that workers are knowledgeable of potential hazards and effectively able to use available control measures. Workers will be protected from unexpected hazards arising from operations by adherence to existing Chevron/Santa Fe Energy safety directives and policies, BLM On-shore Oilfield Directives, DOE Orders, occupational health and safety laws and regulations required by local, state and Federal agencies.

4.2 NO-ACTION ALTERNATIVE

The no-action alternative would create no environmental impacts for federal lands. However, Chevron/Santa Fe Energy could confine the project scope to private lands. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area.

For cultural resources, the no action alternative would be the same as the proposed action in terms of potential site disturbance or impact. The negative effect of this alternative would be the lack of gathering additional baseline cultural data on both the Federal and private lands.

Under the No-Action Alternative, there would be no impacts on Federal lands only or change to the present environmental conditions at the project site or surrounding area. However, not implementing the proposed action would not allow the BLM and/or DOE access to the seismic data for federal and adjacent mineral prospects. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area. The tangible and intangible benefits of evaluating the resource potential of public lands would also not be realized.

4.2.1 SUMMARY OF IMPACTS

IMPACT	PROPOSED ACTION	NO ACTION
Air Quality	Small, short term increases in PM, SO_x, NO_x, CO, and VOC during operation; no permits required.	none
Water Resources	No ground water impacts; surface water impacts minimized by standard mitigation procedures.	none
Geology/Soils	No impacts to geologic structures; possible minimal erosion of soils during operation; site reclamation after operation abandonment will beneficially impact soils in the long term.	none
Land Use	None; some livestock grazing; area intensively utilized for petroleum production and related activities since 1900's.	none
Waste Management	Small amounts of solid waste during operations; minimal quantities of RCRA wastes (paint, vehicle fluids, etc.) during routine operation.	none
Ecology	Site is sparsely vegetated with valley saltbush scrub and non-native annual grassland. Shrubs are present mostly along drainages. A variety of animal species use the general area. Impacts to Federally listed species will be avoided.	none
Floodplain/ Wetlands	none anticipated	none
Socio-economic	Small short term beneficial impacts due to employment.	none
Cultural	none anticipated	none
Visual	none anticipated	none
Noise	Minimal during operations; remote location has no nearby receptors	none
Health/ Safety	none anticipated	none
Cumulative	none anticipated	none

4.3 CUMULATIVE EFFECTS

Cumulative effects are those impacts of future state and private actions that are reasonably certain to occur. Future Federal actions shall be subject to the consultation requirement established in Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act, and therefore, are not considered cumulative to the proposed action.

There are other projects currently under review by State, county, and local authorities where biological surveys have documented the present or former occurrence of the Kern mallow, Blunt-nosed leopard lizard, San Joaquin kit fox, giant kangaroo rat, San Joaquin antelope squirrel and Hoover's woolly-star. These projects include urban development, construction of highways and canals, conversion of natural land for agricultural purposes, mineral and wind energy development, flood control and reservoir construction, rodenticide use, and overgrazing on public and private lands. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

The proposed Chevron/Santa Fe Energy Midway Valley 3D seismic project in this evaluation, considered together with other non-Federal actions, and considering the project mitigations herein described, would not appreciably reduce the likelihood of survival and recovery of the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin antelope squirrel, or Hoover's woolly-star.

A detailed description of mitigation measures is presented in Appendix A.

If, during the course of the proposed action, the established amount or extent of incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, or giant kangaroo rat is exceeded, the causative action shall cease and formal consultation shall be reinitiated immediately to avoid violation of section 9 of the Endangered Species Act.

Cumulative effect to cultural resources would be the same as the proposed action.

5.0 LIST OF AGENCIES AND PERSONS CONSULTED

U.S. Fish & Wildlife Service
Sacramento Endangered Species Office
3310 El Camino Ave., Suite 130
Sacramento, CA 95821-6340

Wayne White, Field Supervisor
Peter Cross, Central Valley Branch Chief
Jan Knight, Botanist
Heather Bell, Wildlife Biologist

Stephen Tabor
TWS - Certified Wildlife Biologist
BioEnvironmental Associates
4209 Lantados Street, Suite A
Bakersfield, CA 93307

Rex E. Thomas, PH.D.
BioEnvironmental Associates
4130 Saddle Notch Drive
Fort Collins, CO 80526
(970) 225-9549

J. F. Regal, Soil Scientist
Soil Conservation Service
Bakersfield, CA

Jim Robinson
Environmental Specialist
Santa Fe Energy Resources, Inc.
5201 Truxtun Avenue, Suite 100
Bakersfield, CA 93309
(805) 322-3992

Roslyn Muller
Environmental Engineer/Specialist
ESF&H Dept.,
Western Production Business Unit
Chevron USA, Inc.
4900 California Avenue
P.O. Box 1392
Bakersfield, CA 93302
(805) 633-4438

CDF&G
Jeff Single
1234 East Shaw Avenue
Fresno, CA 93567

Mr. Larry Myers, Executive Secretary
Native American Heritage Commission
915 Capitol Mall, Room 288
Sacramento, CA 95814

Mr. J. R. Manual, President
Native American Heritage Preservation Council
P.O. Box 1507
Bakersfield, CA 93302

Duane M. Garfield Sr., Chairperson
Tule River Reservation
P.O. Box 589
Porterville, CA 93258

Mr. Clarence Atwell Jr., chairperson
Santa Rosa Rancheria
P.O. Box 8
Lemoore, CA 93245

Cherilyn Widell
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 94296
Sacramento, CA 94296-001

Robert E. Parr
Cultural Resource Facility
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099

Souther San Joaquin Valley Information Center
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099

PETE WILSON
GOVERNOR

State of California

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814

LEE GRISSOM
DIRECTOR

January 9, 1997

CHARLIE ELLISON
US DEPT. OF THE INTERIOR - BLM
3801 PEGASUS AVENUE
BAKERSFIELD, CA 93308

Subject: CHEVRON USA, INC. AND SANTA FE ENERGY RESOURCES INC. 3-D
SCH #: 96124002

Dear CHARLIE ELLISON:

The State Clearinghouse submitted the above named environmental document to selected state agencies for review. The review period is closed and none of the state agencies have comments. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call at (916) 445-0613 if you have any questions regarding the environmental review process. When contacting the Clearinghouse in this matter, please use the eight-digit State Clearinghouse number so that we may respond promptly.

Sincerely,

Antero A. Rivasplata

ANTERO A. RIVASPLATA
Chief, State Clearinghouse

6.0 REFERENCES

BioEnvironmental Associates. 1993. Biological evaluation for the Chevron Belridge 3D seismic vibroseis prospect, Kern County, California. Unpubl. Rpt. prepared for Western Geophysical Company. 14 pp. + Maps.

BioEnvironmental Associates. 1995. Evaluation of impacts of the Belridge Geophysical Exploration Project on small mammal burrows and the endangered plant Kern mallow (Eremalche kernensis) in the Lokern natural area, Kern County, California. Unpubl. Rpt. Prepared for U.S. Bureau of Land Management, Bakersfield, California, 18 pp., + Appendix A.

BioSystems Analysis, Inc. 1991. Sensitive biological resource report for the Chevron Belridge 3D seismic survey, Kern County, California. Unpubl. Rpt. prepared for Chevron Exploration and Production Services, Houston, Texas. 27 pp. + Appendices.

DOE/BLM EA-1124, May 1996 - 3D Seismic

Latta, F. F. 1977. Handbook of the Yokuts, Bear State Books, second edition, Santa Cruz, California

Mitchell, D.L. 1989. Geophysical survey line plant study, Lokern Area, Kern County, California. 16 pp.

Remsen, J.V. Jr. 1978. Bird species of special concern in California, an annotated list of declining or vulnerable bird species. Calif. Dept. of Fish and Game. Nongame Wildlife Investigations, Wildlife Management Branch Administrative Report No. 78-1. 52 pp.

Smith, J.P. and K. Berg. 1988. Inventory of rare and endangered vascular plants of California. California Native Plant Society Special Publication No. 1 (4th edition). California Native Plant Society, Sacramento, CA. 166 pp.

Southern San Joaquin Valley Information Center
California State University, Bakersfield
9001 Stockdale Highway
Bakersfield, California 93311-1099

Taylor, D.Wm. and W.B. Davilla. 1986. Status survey of three plants endemic to the San Joaquin Valley, California. U.S. Fish and Wildlife Service, Sacramento, California. 131 pp.

U.S. Fish and Wildlife Service (USFWS). 1989b. Endangered and threatened wildlife and plants. U.S. Government Printing Office: 1989 0-225-765:QL3. 34 pp.

U.S. Fish and Wildlife Service (USFWS). 1996. Endangered and threatened wildlife and plants;

Review of plant and animal taxa that are candidates for listing as endangered or threatened species. Federal Register. 61(40): 7596-7613.

U.S. Fish and Wildlife Service (USFWS). 1993. Reinitiation of formal Section 7 Consultation Concerning Chevron Exploration and Production Services' Proposed Belridge 3D Seismic Survey in the Lokern Road Area, Kern County California. December 17 (1-1-92-F-26-R1) 23 pp.

Williams, D.F. 1986. Mammalian species of special concern in California. California Department of Fish and Game, Wildlife Management Division, Administrative Report 86-1. 112 pp.

APPENDIX A

MITIGATION MEASURES

All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications.

A. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- ~~50~~ 30 feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;
- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

B. Access route avoidance criterion for off-road vehicle travel:

1. No sensitive wildlife resources shall be located within a 50-foot corridor along access routes and receiver lines.

C. The seismic contractor shall test soil conditions to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

D. Geophones will be placed on BLM and DOE lands in the following manner:

1. All vehicles will avoid driving on areas of cryptogamic soils.

2. The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

3. If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

4. Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

E. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

F. No off-road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's woolly-star will be enforced.

G. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat the following reasonable and prudent measures are required.

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.

2. The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows shall be minimized.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized.

4. The potential for unauthorized vehicle use of off-road survey routes shall be minimized.

H. The seismic contractor shall provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

1. The potential for harm or mortality to listed wildlife species and their habitats shall be minimized by implementing the following procedures:

a) All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Energy Midway Valley 3D seismic project shall be followed. Mitigation measures presented

below incorporate such requirements of the proposed Midway Valley 3D seismic project.

b) Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist shall provide an employee orientation program to project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements shall incidental take occur, and applicable definitions and prohibitions under the Endangered species Act of 1969 Act.

c) Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) shall conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys shall be reviewed. San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows shall be flagged for avoidance, as necessary, and additional habitat features, if any, shall be identified and flagged as necessary.

d) Qualified biologists shall accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Qualified biologists may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one qualified biologist shall accompany the vibrator crew working within endangered species habitat.

e) Pets shall not be permitted on the project site during project activities.

f) All food-related trash such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers only and regularly removed from the project site.

g) All spills of hazardous materials within endangered species habitats shall be cleaned up immediately per Chevron's or other land owner's SPCC plans.

h) Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

i) All project-related vehicles shall observe a speed limit of 20 mph or less on all routes

that traverse endangered species habitat, except on State and County highways and roads.

j) Within 45 calendar days after completion of the project, the seismic contractor shall submit to the Service, the BLM, DOE and NPRC a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures, if any; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

2. All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards shall be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

   a) All project vehicles shall observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

   b) To minimize effects of geophone deployment, the applicant shall utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles shall be used to deploy geophones in such areas. During geophone deployment, work crews shall make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators shall avoid such habitat areas by 10 feet. One biologist exclusive of biologists observing vibrator crew activities shall oversee the activities of geophone line deployment crews.

   c) All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes shall be prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagging shall be collected and removed after completion of the project.

   d) The applicant shall make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

e) Project biologists shall keep an accurate and running tally of the number of dens and burrows damages, destroyed, or otherwise affected by project activities. Such tallies shall be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project shall be reported in the post-activity compliance report.

f) If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS shall be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biologist and that such excavation is within incidental take limits provided in the projects biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

3. The extent of off-road survey routes and other seismic testing areas shall be minimized by implementing the following procedures:

a) Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate shall be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones shall be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.

b) Project related vehicles shall be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and described in existing documentation). Otherwise, no off-road vehicle travel shall be permitted.

c) Unauthorized vehicle use of off-road survey routes shall be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

I. The following general and specific measures shall be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive resources (burrows) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles shall follow through areas of low density shrubs and other vegetation. Shrubs and burrows shall be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

1. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
2. Check percent slope, and
3. Check vegetation density, and
4. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys shall include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower

breeding success, and may cause the owls to abandon the site. Seismic travel corridors shall be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites. The recommended mitigation measures, in general, should greatly reduce the potential for impacts to short-eared owls within the project area.

Vegetation and Habitat Types

J. Project related vehicles shall be restricted to approved travel routes and paths/roads. Large shrubs shall be avoided in an effort to minimize impact to wildlife habitat. Large shrubs shall be avoided by carefully selecting travel paths/roads to avoid crushing individuals. In addition, washes represent a fragile habitat type and function as seasonally productive sources of annual vegetation for animals, as dispersal corridors, and as areas affording favorable burrow construction habitat. Washes shall be avoided by all vehicular activity as feasible.

K. If during any phase of the seismic operation any oil or other pollutant shall be discharged from project related vehicles, or from containers impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of applicant to control, cleanup or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

ADDITIONAL MITIGATION

Cultural Resources

1. Prior to initiation of field work, all field supervisors and personnel shall be briefed by an archaeologist or cultural specialist about the general cultural background for the region and the sensitivity of cultural resources in the project vicinity. The archaeologist shall inform project personnel to avoid flagged areas, not to collect or disturb artifacts, and to report any late discovery of cultural resources in the project vicinity to the archaeologist.

2. Once land surveyors pin flag the center line of the geophone and source lines, an intensive cultural inventory on all seismic corridors will be conducted in advance of land disturbing activities; e.g., vibroseis trucks, cross country vehicles.

3. All cultural sites will be flagged for avoidance including a safe buffer zone to prevent any

disturbance to them and monitored for compliance by an archaeologist. Once seismic activities in the area cease, flagging will be removed.

4. Archaeologist shall be present during all potentially damaging project activities that are near cultural resources unless flagging alone is determined sufficient for avoidance. The project archaeologist shall assist field personnel in avoiding disturbance to cultural sites.

5. **Should any disturbance occur to cultural resources during the project, it shall be immediately reported to the BLM/DOE authorized staff. All work in the immediate area of disturbance shall cease until approval to proceed is given by the BLM/DOE authorized officers, subsequent to completion of cultural compliance.**

6. The archaeological contractor will provide at a minimum a weekly status report to BLM/DOE on project progress or more frequently should problems arise. The report will at a minimum include the number of miles surveyed, number of sites discovered and recorded or updated, areas where vibroseis activities have been completed, the number of sites flagged for avoidance, and the results of monitoring activities.

7. After completion of the project, a complete archaeological report prepared by the archaeological contractor with the results of the cultural investigation, the number of sites avoided, and assessment of monitoring activities will be provided to the SHPO, with copies to BLM and DOE.

APPENDIX B

U.S. FISH AND WILDLIFE SERVICE CONSULTATION AND BIOLOGICAL ASSESSMENT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Sacramento Field Office
3310 El Camino Ave, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:

1-1-96-F-120

November 12, 1996

Mr. James W. Abbott
Area Manager
Bureau of Land Management
3801 Pegasus Drive
Bakersfield, CA 93308

Subject: Endangered Species Formal Consultation on the Midway Valley 3D Geophysical Exploration Project Proposed by Chevron U.S.A., Inc. and Sante Fe Energy Resources in Western Kern County, California.

Dear Mr. Abbott:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on the Service's review of the Midway Valley 3D Geophysical Exploration project proposed by Chevron U.S.A., Inc. and Sante Fe Energy Resources in western Kern County, California, and its effects on the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*), giant kangaroo rat (*Dipodomys ingens*), blunt-nosed leopard lizard (*Gambelia silus*), Kern mallow (*Eremalche kernensis*), and threatened Hoover's woolly-star (*Eriastrum hooveri*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.). Your July 8, 1996, request for formal consultation was received on July 10, 1996. After review of the initial information the Service and the Bureau of Land Management (BLM) determined that the proposed project would not affect Kern mallow because the proposed project is located well outside all known populations of this plant. On October 30, 1996, BLM sent a letter withdrawing Kern mallow from the consultation.

This biological opinion is based on the following: (1) information provided during an initial meeting of May 22, 1996 between the Service, BLM and representatives from Chevron U.S.A., Inc. and Sante Fe Energy Resources; (2) the July 8, 1996, BLM memorandum and accompanying project description and biological evaluation; (3) the July 19, 1996, letter from Chevron U.S.A., Inc.; (4) the August 6, 1996, letter from the Department of Energy (DOE); (5) the August 21, 1996, letter and aerial photos; (6) the August 23, and October 30, 1996, letters; (7) September 12, 13, 16, 17, and October 15, 1996, faxes from Chevron U.S.A., Inc.; (8) the October 31, 1996, BLM memorandum and accompanying updated project description and biological evaluation; (9) conversations with Chevron U.S.A., Inc. and BLM staff; and (10) other sources of information. A complete administrative record of this consultation is on file in this office.

BIOLOGICAL OPINION

Description of the Proposed Action

Chevron U.S.A., Inc. and Sante Fe Resources have contracted Western Geophysical to conduct a geophysical 3D seismic survey in Midway Valley located in western Kern County, California. The project specific location is provided in figure 1. The project proponents' complete and updated project

description and biological evaluation have been attached as appendix A, and a brief synopsis is below.

The project spans 42,164 acres, or 66 square miles. Land ownership/mineral rights involved include approximately 31,444 acres of private lands (of which 20,223 acres, or 64 percent of the total, are owned by Chevron U.S.A., Inc./Santa Fe Resources), 6,880 acres of military reservations (DOE's Naval Petroleum Reserve 2), and 3,840 acres of land administered by the BLM. There are 9,373 acres of native habitat, 8,717 acres of low, 11,945 acres of moderate, 9,851 acres of high disturbance from oil field development, 175 acres in agricultural production, and 2,203 acres of urban development.

The project involves establishing approximately 34 lines of receiver stations (geophones) and 52 source lines over the 66 square mile area. Source lines will consist of eight vibroseis (source) points, 165 feet apart, positioned in a staggered array ("brick" pattern) perpendicular to the receiver lines (southwest to northeast) (Figure 2).

It is estimated that a maximum of 392 acres may be temporarily impacted by the proposed project from: (1) vibroseis pad compaction (185 - 231 acres); (2) vibrator truck tire compaction (24 acres); (3) off-road vehicle traffic by vibroseis trucks (91 - 121 acres); and, (4) geophone deploying trucks (16 acres).

In order to minimize potential impacts to threatened and endangered species within the project area, seismic data acquisition is scheduled to begin November 1, 1996, and conclude by late-February 1997.

Species Status

San Joaquin kit fox

The San Joaquin kit fox was listed as endangered by the U.S. Department of the Interior in 1967 (32 FR 4001) and by the State of California in 1971. A recovery plan approved in 1983 proposed interim objectives of halting the decline of the San Joaquin kit fox and increasing population sizes above 1981 levels (USFWS 1983). In 1996 preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes a revised recovery plan for the kit fox (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the approved Recovery Plan for this species and preliminary draft Recovery Plan.

Kit foxes diet varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. In the southern portion of their range, kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), white-footed mice (*Peromyscus* spp.), and other nocturnal rodents comprise about one-third or more of their diets. Kit foxes also prey on California ground squirrels (*Spermophilus beecheyi*), black-tailed hares (*Lepus californicus*), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and insects. Vegetation and insects occur frequently in feces. Dens are used by the fox for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and numerous dens may be used throughout the year. However, evidence that a den is being used by kit foxes may be absent. Kit foxes are subject to competitive exclusion or predation by other species, such as the non-native red fox (*Vulpes vulpes*), coyote (*Canis latrans*), domestic dog (*Canis familiaris*), bobcat (*Felis rufus*), and large raptors.

Giant kangaroo rat

The giant kangaroo rat was listed as endangered by the U.S. Department of the Interior in 1987 (52 FR 283-288) and by the State of California in 1980. In 1996 a preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes the giant kangaroo rat (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the preliminary draft Recovery Plan.

The historical distribution of giant kangaroo rats encompassed a narrow band of gently sloping ground along the western edge of the San Joaquin Valley, with occassional colonies on steeper slopes and ridge tops, from the base of the Tehachapi Mountains, Kern County in the south, to near Los Banos, Merced County in the north. Historical habitat was estimated to have encompassed 1,561,017 acres (631,724 ha). The species population is currently fragmented into six major geographic units. The units located in the southern San Joaquin Valley are: the Kettleman Hills in Kings County; and western Kern County in the area of the Lokern, Elk Hills, and other uplands around McKittrick, Taft, and Maricopa. The major units are fragmented into more than 100 smaller populations, many of which are isolated by several miles of barriers such as steep terrain with plant communities unsuitable as habitat, or agricultural, industrial, or urban land without habitat for this species. Extant habitat is estimated to be 27,540 acres (11,145 ha), about 1.8 percent of historical habitat.

Within the area of currently occupied habitat, populations of giant kangaroo rats studied since 1979 have expanded and declined 6 to 10 fold with changing weather patterns. Density estimates range from 2.5 to 275 animals per acre (1 to 110 per ha). Changes in density generally coincide with amount of rainfall and herbaceous plant productivity, however, the seed caching behavior of these rats may offset this effect. Giant kangaroo rats are primarily seed eaters, caching ripening seed heads in small surface pits or large stacks on the surface over their burrow system. After curing for several weeks, seeds are transported to underground larders. Giant kangaroo rats forage on the surface from around sunset to near sunrise, with most activity taking place in the first 2 hours after dark. Foraging activity is greatest in the spring as seeds of annual plants ripen. Giant kangaroo rats develop burrow systems with one to five or more separate openings, of two types: a vertical shaft with a circular opening and no dirt apron; and a larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth.

Kangaroo rats have an adaptable reproductive pattern that is affected by both population density and availability of food. In most years, females are reproductive between December and April, but in colonies with low densities, reproduction extended into late summer. The major time for dispersal of giant kangaroo rats seems to be following maturation of young, about 11-12 weeks after birth. Predators of giant kangaroo rats are numerous and include most rodent-hunting mammals, snakes, and owls.

Preferred habitat of giant kangaroo rats is annual grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils. However, most remaining populations are on poorer and marginal habitats which include shrub communities on a variety of soil types and on slopes up to about 22°.

Blunt-nosed leopard lizard

The blunt-nosed leopard lizard was listed as endangered by the U.S. Department of the Interior in 1967 (32 FR 4001) and by the State of California in 1971. A recovery plan was first prepared in 1980 (USFWS 1980) and revised in 1985 (USFWS 1985). In 1996 a preliminary draft recovery plan for San Joaquin Valley upland terrestrial species was drafted which includes the blunt-nosed

leopard lizard (USFWS 1996). The following information is extracted and edited from that draft. Citations and further information are in the approved Recovery Plans and preliminary draft Recovery Plan.

The blunt-nosed leopard lizard is a relatively large lizard of the family Iguanidae and is endemic to the San Joaquin Valley, inhabiting open, sparsely vegetated areas of low relief on the Valley floor and the surrounding foothills. Although the boundaries of its original distribution are uncertain, blunt-nosed leopard lizards probably occurred in the San Joaquin Valley from Stanislaus County in the north, southward to the Tehachapi Mountains in Kern County, the Carrizo Plain and Cuyama Valley, and the foothills of the Sierra Nevada and Coast Range Mountains. In general, leopard lizards are absent from areas of steep slope, dense vegetation, or areas subject to seasonal flooding.

The currently occupied range of the blunt-nosed leopard lizard is in scattered parcels of undeveloped land on the Valley floor, where they are most commonly found in the Annual Grassland and Valley Sink Scrub. These lizards also inhabit Alkali Playa and Valley Saltbush Scrub. In the southern San Joaquin Valley, extant populations are known to occur on the Kern and Pixley National Wildlife Refuges, Liberty Farms, Allensworth, Antelope Plain, Buttonwillow, Elk Hills, and Tupman Essential Habitat Areas, on the Carrizo and Elkhorn plains, north of Bakersfield around Poso Creek, and in western Kern County around the towns of Maricopa, McKittrick, and Taft.

Blunt-nosed leopard lizards feed primarily on insects, lizards, and occasionally plant material. Because they have similar diets, interspecific competition probably occurs between the blunt-nosed leopard lizard and California whiptail (*Cnemidophorus* spp.).

Breeding activity begins within a month of emergence from dormancy and lasts from the end of April through the beginning to end of June. Male territories may overlap those of several females, and a given male may mate with several females. Two to six eggs are laid in June and July, and their numbers are correlated with the size of the female. Under adverse conditions, egg-laying may be delayed 1 or 2 months or reproduction may not occur at all. Females typically produce only one clutch of eggs per year, but some may produce three or more under favorable environmental conditions. After about 2 months of incubation, young hatch from late July through early August, rarely to September.

Males are highly combative in establishing and maintaining territories. Male and female home ranges often overlap. The mean home range size varies from 0.25 to 2.7 acres (0.1 to 1.1 ha) for females and 0.52 to 4.2 acres (0.2 to 1.7 ha) for males. Densities estimates range from 0.1 to 4.2 lizards per acre (0.3 to 10.8 per ha). Population densities in marginal habitat generally do not exceed 0.2 blunt-nosed leopard lizards per acre (0.5 per ha). There are no current overall population size estimates for the species.

Leopard lizards use small rodent burrows for shelter from predators and temperature extremes. Burrows are usually abandoned ground squirrel tunnels, or occupied or abandoned kangaroo rat tunnels. Each lizard uses several burrows without preference, but will avoid those occupied by predators or other leopard lizards. In areas of low mammal burrow density, lizards will construct shallow, simple tunnels in earth berms or under rocks. Potential predators are numerous and include snakes, predatory birds, and most carnivorous valley mammals.

Seasonal above-ground activity is correlated with weather conditions, primarily temperature. Lizards are active on the surface when air temperatures are between 73 and 104°F (23.5 and 40.0°C) and surface soil temperatures are 71 and 122°F (22 and 50°C). Optimal activity occurs when

ground temperatures are between 71 and 97°F (22 and 36°C) or slightly higher. Smaller lizards and young have a wider activity range than the adults.

Hoover's Woolly-Star

Hoover's woolly-star was federally listed as threatened on July 19,1990 (55 FR 29370). It is a small annual herb of the phlox family that produces 1/4-inch wide white flowers and is densely hairy on the stems, leaves, and some flowering parts. Field surveys conducted throughout the southern San Joaquin Valley by Federal agencies and private consultants in 1992 and 1993 have documented numerous occurrences of Hoover's woolly-star. Surveys have shown that Hoover's woolly-star populations range from the upper Cuyama Valley near Ventucopa, Santa Barbara County, northward to the Panoche Hills in San Benito County, a distance of approximately 140 miles. Hoover's woolly-star occurs in 42 USGS 7 ½ - minute quadrangles within Kings, Kern, San Luis Obispo, Santa Barbara, San Benito, and Fresno counties. Hoover's woolly-star occurrences primarily are located within four areas. The four areas from largest to smallest are: (1) the Kettleman Hills area, (2) the Carrizo Plain-Elkhorn Plain-Temblor Range-Caliente Mountains-Cuyama Valley-Sierra Madre Mountains area, (3) the Lokern-Elk Hills-Buena Vista Hills-Coles Levee-Maricopa-Taft area, and (4) the Antelope Plain-Lost Hills-Semitropic area. Additional, more isolated populations occur throughout the region. An intra-agency draft recovery plan has been developed for Hoover's woolly-star. Hoover's woolly-star is now known from Fresno, Kings, San Luis Obispo, and Santa Barbara Counties at scattered locations spanning a distance of 100 miles in the inner southern Coast Range of central California. The species is now documented from over 600 sites that cover some 2,200 acres. Hoover's woolly-star appears to prefer slightly sandy, sometimes silty soils that often exhibit cryptogamic crusts and is found on ridgetops, hillsides, benches, alluvial fans, and level areas at elevations from 280 to 2,770 feet. It continues to be threatened throughout parts of its range by oil and gas development, cattle and sheep grazing, agricultural-land conversion, urbanization, and other surface-disturbing activities. The majority of known locations of Hoover's woolly-star are on BLM lands or combinations of BLM/split-estate/private lands (BLM 1993).

Environmental Baseline

San Joaquin kit fox

In the San Joaquin Valley, prior to 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side. Historically, San Joaquin kit foxes occurred in several San Joaquin Valley native plant communities. In the southern-most portion of the range these communities included Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. By 1930 the kit fox range had been reduced by more than half, with the largest portion remaining in the southern and western parts of the Valley. By 1958 an estimated 50 percent of the Valley's original natural communities had been lost. This loss was due to extensive land conversions and intensive land uses, including the use of pesticides. By 1979, only about 6.7 percent of the San Joaquin Valley's original wildlands south of Stanislaus County remained untilled and undeveloped. Today many of these communities are only represented by small, degraded remnants. Kit foxes are, however, found in grassland and scrubland communities which have been extensively modified by humans with oil exploration, wind turbines, agricultural practices, and/or grazing.

Loss and degradation of habitat by agricultural, industrial, and urban developments and associated practices continue, decreasing the carrying capacity of remaining habitat and threatening kit fox survival. Such loss contribute to kit fox declines through displacement, direct and indirect

mortalities, barriers to movement, and reduction of prelations (USFWS 1996).

Population monitoring of listed vertebrate species at t Complex in 1995 indicate that approximately 50 percent fewer foxes were red during the 1995 annual San Joaquin kit fox population monitoring g session than in 1994. This decrease was likely caused by sharp decline he abundance of kangaroo rats, other rodents, and leporid prey species, bly depressing overall reproductive success and survival (Otten 1996).

Giant kangaroo rat

Completion of Federal and State water projects resulted pid cultivation and irrigation of giant kangaroo rats habitat. Urban a ustrial developments, petroleum and mineral exploration and ext n, new energy and water conveyance facilities, and construction of commun n and transportation infrastructures continue to destroy habi r giant kangaroo rats and increase the threats to the species by reducin further fragmenting populations. Use of rodenticide-treated gr control ground squirrels and kangaroo rats also may have contributed t decline of giant kangaroo rats. The impending sale of the Naval Petrole serves in California to private interests represents a threat to of the three largest regional populations of giant kangaroo rats (US 996).

During and following the 1994-1995 winter, biologists no a decline in abundance of kangaroo rats in the southern San Joaqui alley. Lower than expected trapping results, and decreased sig activity were observed at several dispersed sites. Dramatic decl s were noted for short-nosed, Tipton, and Heermann's kangaroo r , although only modest reductions were noted for giant kangaroo rat pulations on the valley floor (Single et al. 1996). The Lokern Ar giant kangaroo rat population appeared to be only slightly recovered during e 1996 giant kangaroo rat trapping conducted in Lokern Area by the California Energy Commission (L. Speigel, pers. comm). Population monitor of listed vertebrate species at the NPR Complex in 1995 indicated t giant kangaroo rat abundance was lower than in previous years, possibly elated to the unusually high precipitation in the spring of 1995 (Hill 996).

Blunt-nosed leopard lizard

Stebbins, in 1954, first recognized that agricultural conversion of its habitat was causing the extirpation of the blunt-nosed leopard lizard. Cultivation, petroleum and mineral extraction, pesticide applications, off-road vehicle use, and construction of transportation, communication, and irrigation infrastructures collectively have caused the reduction, fragmentation of populations and decline of blunt-nosed leopard lizards.

Habitat disturbance, destruction, and fragmentation continue as the greatest threats to blunt-nosed leopard lizard populations. Disturbances and modifications of habitats within areas of mineral and petroleum development pose lesser, but continuing threats as they degrade the habitat. Direct mortality occurs when animals are killed in their burrows during construction, killed by vehicle traffic, drowned in oil, or fall into excavated areas from which they are unable to escape. Displaced lizards may be unable to survive in adjacent habitat if it is already occupied or unsuitable for colonization.

Livestock grazing can result in removal of herbaceous vegetation and shrub cover and destruction of rodent burrows used by lizards for shelter. Unlike cultivation of row crops, which precludes use by leopard lizards, light or moderate grazing may be beneficial. The use of pesticides may directly and indirectly affect blunt-nosed leopard lizards. The insecticide Malathion has been used since 1969 to control the beet leafhopper, and its use may reduce

insect prey populations. Fumigants such as methyl bromide are used to control ground squirrels. Because leopard lizards often inhabit ground squirrel burrows, they may be inadvertently poisoned (USFWS 1996).

Population monitoring of listed vertebrate species at the NPR Complex in 1995 indicated a lower abundance of blunt-nosed leopard lizard adults. This may in part be due to the increase in the amount of vegetative cover likely resulting from above average precipitation early in this year (EASI 1996).

Hoover's Woolly-Star

Populations of Hoover's woolly-star, with an estimated total of more than 6,000 individual plants, have been identified on DOE's Naval Petroleum Reserve. A current comprehensive floristic survey on NPR-1, part of the NPR Complex, has resulted in many new occurrences of Hoover's woolly-star being discovered (Hinshaw 1996). The 1995 Annual Report on the Endangered Species and cultural resources program at NPR Reserves in California documented a minimum of 278 Hoover's woolly-star localities on or adjacent to the NPR Complex (EG&G 1995).

In summary, Midway Valley is located between areas already identified for their biological significance and their critical importance to listed species recovery efforts: the Lokern Area is about 6 miles to the northeast, and DOE's NPR-2 is adjacent on the southeast. However, the biological resources of Midway Valley are not well documented. Ongoing research and population monitoring at the NPR Complex provides the Service with the best available data from which to produce the environmental baseline. Some information is available from the Lokern Area and the Midway/Sunset Oil Fields, unfortunately there has not been the consistent monitoring needed.

The Service is concerned that the above mentioned detrimental effects to listed species from the unusually high precipitation combined with other actions such as the ongoing degradation and fragmentation of listed species habitat within the NPR Complex (USFWS 1995,) successful recovery of these effected species to pre-1995 levels is at risk. Additionally, long-term uncertainty of ownership of NPR-1, which has been identified as essential to recovery actions, puts the future of the listed species within the greater action area at even more risk. The Service is closely monitoring and evaluating all actions and environmental conditions in the southern San Joaquin Valley. The proposed project may be beneficial by providing data on listed species habitat and presence in the Buena Vista Valley. This would enhance future environmental baseline information.

Effects of the Proposed Action on Listed Species

Direct Effects on Listed Wildlife

Adverse effects of the proposed Midway Valley 3D geophysical exploration project on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats may result from several sources. Individual kit foxes, leopard lizards, and kangaroo rats may be injured or killed by vehicle strikes as a result of vehicles moving through the project area. However, the likelihood of this type of morality is relatively low for kit foxes and kangaroo rats, due to their nocturnal habits. The geophysical testing will only be conducted during daylight hours. The potential for moving vehicle encounters with kit fox pups and leopard lizards would be somewhat higher if the project is conducted during their above-ground activity period. This project has been scheduled so as to avoid both of these activity periods. Additionally, no off-road vehicle travel is allowed except within approved access routes on which pre-activity surveys have been conducted, with the vibroseis trucks accompanied into and through the project area by a qualified biological monitor, and all other project-related vehicles observing a speed limit of 20

MPH or less on all routes that traverse endangered species habitat, except as posted on State and County highways and roads.

Individual kit foxes, leopard lizards and giant kangaroo rats also may be subject to injury or mortality through accidental entombment in collapsed dens or burrows as a result of vehicle traffic or from ground vibration caused by the vibroseis trucks. Individuals may also be temporarily or permanently displaced into adjacent areas and be vulnerable to increased predation, exposure, or stress through disorientation and loss of shelter. The potential for entombment will be minimized by measures described in preceding paragraph, the proposed buffers which will be physically established around sensitive habitat features prior to project activity, the narrowing of the 50-foot access route or allowing only foot traffic to avoid sensitive habitat features, and the potential relocation or "stacking" of source points to avoid sensitive habitat features. Additionally, seismic activity will occur early in the San Joaquin kit fox breeding cycle, minimizing the potential for entombment of adults and their pups. Displacement of individuals into adjacent areas will be minimized by the timing and duration of the project, which is such that the most active above ground periods for the giant kangaroo rat, blunt-nosed leopard lizard, and juvenile San Joaquin kit foxes will be minimized. Because adult San Joaquin kit foxes are usually familiar with their home range and change dens routinely, they are not as likely to be as affected as juveniles who may be less familiar with nearby cover and escape opportunities.

Indirect Effects on Listed Wildlife

San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats may be indirectly affected by the proposed action through temporary loss or degradation of home ranges and adjacent areas. Such loss or degradation could result from human presence, and because of ground compaction and crushing of vegetation by vibroseis and geophone trucks. However, the temporal nature of the project, and the project's timing (as mentioned above) are such that the loss or degradation of habitat from human presence has been minimized. Ground compaction may have an effect on the giant kangaroo rats ability to use those areas for burrowing. However, recent post-3D follow-up survey information collected from Chevron U.S.A., Inc.'s Belridge 3D seismic project suggests that small mammal habitat may be negligibly effected from the impact of 3D seismic acquisition. Data indicate that no long-term impact on habitat use by burrowing rodents was evident within approximately 6 months of completion of a 3D vibroseis seismic project and "...the impacts associated with the activity appear to have had some positive effect on burrow construction by the small mammal community. Moreover, it appears that relative loose soil along cross country travel paths created by seismic trucks used for geophone and source lines (excluding the bottom of the vibe pad depression) may have been especially attractive to burrowing rodents" (Tabor and Thomas 1995). Caution should be exercised, however, because this study looks only at one location with specific soil and vegetation types and one years precipitation pattern; it may not be representative of the effects of all 3D seismic surveys.

Kit foxes, leopard lizards, and kangaroo rats inhabiting the project area also may be subject to harassment while the project is being conducted. Such harassment may result from ground vibrations, burrow and den destruction, and from the inherent increase in vehicular traffic and human presence. The potential for harassment will be minimized by measures described in preceding paragraphs, specific measures regarding employee training, pets, and trash, and the presence of biological monitors. However, harassment to individuals from noise and vibration is inherent in this activity and unavoidable.

Direct Effects on Hoover's Woolly-Star

The greatest adverse impacts of the proposed project on Hoover's Woolly-Star

would occur as a result of the compaction of soils beneath the vibe pads. Soil compaction and associated habitat degradation are the major adverse effects of the project with respect to listed plants.

It is unlikely that 3D seismic survey impacts, including access to source, placement of geophone lines, or subsequent collection of geophone lines would significantly affect the resident seedbank of the listed plants as long as the project is carried out after Hoover's woolly-star seed shatter and while the soil is dry. It is possible that some Hoover's woolly-star seeds may germinate if sufficient moisture is received during the project and compaction on dry or moist soils may adversely affect these seedlings. Most germination will occur from January or February until mid-April (Ellen Cypher, pers. comm. 1996).

The Midway Valley 3D seismic survey has incorporated a number of project features that will minimize surface disturbance and soil compaction effects on listed plants. Localized project effects likely would be detectable in post-project monitoring for some time, and strict adherence to disturbance-minimizing procedures is of the utmost importance to maintain habitat quality for listed plants, including surgace microflora and organic matter cover. On a project-wide basis, in consideration of all the mitigation procedures implemented, it is unlikely that project impacts would significantly impair or preclude the long-term persistence of Hoover's woolly-star on the site.

Additional Indirect Effects on All Listed Species

Finally, the proposed Midway Valley 3D geophysical exploration project could have certain long-term effects to San Joaquin Valley threatened and endangered species within the Midway Valley area. These would include inadvertent road development that may arise as a result of unauthorized vehicle use of the "tracks" left after the project is completed. Such tracks are an attraction to recreational and casual vehicle users and sometimes become *de facto* secondary roads if they are used repeatedly. However, such impacts have not been noted following the Belridge 3D project which occurred in the adjacent Lokern Area in 1993 and 1994 (Tabor and Thomas 1995).

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects on the San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, and Hoover's woolly-star include ongoing habitat destruction, degradation, and fragmentation by conversion to agricultural, water conveyance facilities, and urban and industrial uses.

Habitat degradation would be further intensified if other oil operators in the Midway Valley area also propose seismic surveys. Repeated surveys could result in long term habitat degradation. However, given the prohibitive cost of such an extensive survey, and the difficulty other oil operators would have in securing landowner permission, it is not anticipated that another 3D seismic survey of this magnitude within this same valley would be likely. Smaller surveys are, however, still a possibility.

Conclusion

After reviewing the current status of the San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, and Hoover's woolly-star, the environmental baseline, the effects of the proposed project, and the cumulative effects, it

is the Service's biological opinion that the Midway Valley 3D geophysical exploration project, as proposed, although affecting individuals, is not likely to jeopardize the continued existence or recovery of the listed species covered under this biological opinion. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

Amount or Extent of Take

The Service anticipates that San Joaquin kit foxes, giant kangaroo rats, and blunt-nosed leopard lizards may be taken incidentally during the proposed project. Project actions that may result in mortality, harm, or harassment of these species have been discussed previously in this biological opinion. Minimization and avoidance measures proposed by BLM and the applicants will substantially reduce, but not eliminate, the potential for incidental taking of these species during the project.

The Service anticipates that incidental take of San Joaquin kit foxes, giant kangaroo rats, and blunt-nosed leopard lizards will be difficult to detect for the following reason(s): small body size; finding a dead or impaired specimen is unlikely; losses may be masked by seasonal fluctuations in numbers or other causes; and the species occurs in dens or burrows. However, the following level of take of these species can be anticipated by the loss of habitat, including food, cover, hibernaculum, and/or breeding sites.

Based on the foregoing, the Service anticipates that the following types and levels of incidental take may occur during the proposed geophysical project:

For San Joaquin kit foxes incidental take is expected to be in the form of;

a. one (1) mortality due to entombment, vehicular strikes, or any other activities associated with the proposed project, and

b. harm and harassment of one (1) pair of foxes and associated young due to the destruction of one (1) occupied natal den, and two (2) pairs of foxes due to the destruction of two (2) unoccupied natal dens by significantly effecting the reproductive success of kit fox pairs by impairing behavioral patterns, including breeding or the feeding and sheltering of young, and

c. harm through loss of habitat, including potential and known non-

natal dens, and foraging areas within the 392 acre footprint of the proposed project, and

d. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 500-foot area adjacent to the access routes and staging areas.

For blunt-nosed leopard lizards we anticipate incidental take in the form of;

a. mortality through loss of unavoidable burrows, and, if present, the individuals therein, within the 392 acre footprint of the proposed project, and

b. harm through degradation of habitat patches, including crushing of vegetation which may harbor prey items, within the 392 acre footprint of the proposed project, and

c. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 30-foot area adjacent to the access routes and staging areas.

For giant kangaroo rats we anticipate incidental take in the form of;

a. one (1) mortality due to entombment in an unavoidable occupied precinct, or vehicular strike,

b. harm and mortality through inadvertent entrapment within seemingly unoccupied precincts, within the 392 acre footprint of the proposed project, and

c. harm through degradation of foraging areas, including compaction and crushing of vegetation, within the 392 acre footprint of the proposed project, and

d. harassment from project related noise and vibration, and the displacement of individuals within the 392 acre footprint of the proposed project and an additional 30-foot area adjacent to the access routes and staging areas.

Sections 7(b)(4) and 7(o)(2) of the Act do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the Act requires a Federal permit for removal or reduction to possession of Federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of the respective State or in the course of any violation of that State's criminal trespass law.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species addressed.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impact of the take on San Joaquin kit fox, giant kangaroo rat, and blunt-nosed leopard lizard populations:

1. Minimize the potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats.

2. Assist the Service in identifying the impacts of 3D Geophysical Exploration on listed species.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must ensure that Chevron U.S.A., Inc., Sante Fe Resources, and their contractor Western Geophysical comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary. If, during the course of the action, take associated with the action exceeds the Service's anticipated levels set forth under the Amount or Extent of Take, such take represents new information requiring review of the reasonable and prudent measures provided. The BLM, or their appointed representative, must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service accepts the proposed minimization and avoidance measures outlined in the project description (text and appendices), with the following revisions, clarifications, and additions.

1. The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats shall be minimized.

   a. San Joaquin kit fox natal dens shall be protected. Unoccupied natal dens shall not be destroyed without prior consent from the Service and only after all means of avoidance are exhausted.

   b. Occupied natal dens in areas of medium to high levels of prior habitat disturbance shall not be destroyed without prior consent from the Service and only after all means of avoidance are exhausted. Occupied natal dens within areas of low or no prior habitat disturbance shall not be destroyed, and shall be avoided by a minimum of 200 feet.

   c. Destruction of unavoidable kit fox dens shall follow the Service's current Standard Recommendations.

   d. Areas of potential blunt-nosed leopard lizard habitat shall be clearly marked with accompanying burrows protected to the maximum extent practicable.

   e. Giant kangaroo rat precincts showing evidence of occupation shall be avoided by a minimum of 30 feet.

   f. Giant kangaroo rat precincts not currently showing evidence of occupation shall be protected to the maximum extent practicable, and shall be destroyed only after all means of avoidance are exhausted.

   g. All appropriate and necessary measures to prevent unauthorized entry to off-road survey routes shall be implemented. BLM shall notify the Service immediately if, despite efforts to deter unauthorized use after project completion, unauthorized use continues. If such unauthorized use or road formation resulting from such use is observed to be significant, the BLM shall reinitiate consultation and the BLM, Chevron U.S.A., Inc., and Sante Fe Resources shall cooperate with the Service in correcting the situation.

2. Assist the Service in identifying the impacts of 3D Geophysical Exploration on listed species.

   a. An inventory of listed species locations collected during the pre-activity surveys and any monitoring efforts should be provided to the Service in the post-activity compliance report, with a copy to the Natural Diversity Data Base and the San Joaquin Endangered Species Recovery Planning Program.

   b. The effects of soil compaction on listed species shall be assessed by determining the extent to which these effects persist in time. This shall include determining the amount of compaction on varying soil types or topographic features and the time taken for these effected soils to return to pre-seismic compaction. In addition, the use of these compacted soils by burrowing species shall be monitored. BLM shall work with the Service in outlining a research project that will address these issues.

   c. If requested, upon completion of any activity or at any reasonable time deemed appropriate by the Service, BLM shall accompany Service personnel on site inspection tours of the sites or other locations, as requested, to review both project impacts to endangered species and their habitats, and compliance with the terms and conditions set forth in this biological opinion.

   d. BLM shall insure that Chevron U.S.A., Inc. and/or Sante Fe Resources appoint a representative who shall be the contact source for any employee who might inadvertently kill or injure a listed species or who finds a dead, injured or entrapped individual of a listed species. This representative shall be identified to the employees during the personnel training conducted by the biological monitor. The name of this representative shall be provided to the Service prior to the commencement of activities.

Reporting Requirements

BLM shall prepare and submit to the Service a brief post-project report within 45 calendar days following completion of the proposed project. This report shall include, but is not limited to: pre-project survey and monitoring results, dates that activities began and ended, a list of all personnel involved with the project who received training, a list of avoidance and take reduction measures implemented, effectiveness of such measures, amount of project area permanently or temporarily disturbed, and occurrence of incidental take of federally listed species.

Any personnel who inadvertently kills or injures a listed species or who finds a dead, injured or entrapped individual of a listed species shall immediately report the incident to the appointed representative.

   a. This representative shall contact the California Department of Fish and Game (CDFG) immediately in the case of a dead, injured or entrapped animal. The CDFG contact for immediate assistance is the Regional Office Dispatcher at 209-243-4005 ext. 151, or State Dispatch at 916-445-0045, they will contact the local warden or local biologist.

   b. The Sacramento Field Office and the CDFG shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox, blunt-nosed leopard lizard, or giant kangaroo rat during project related activities. Notification will include the date, time and location of the

incident or of the finding of a dead or injured animal, and any other pertinent information. If a dead listed animal is found, BLM will retain the carcass until receiving disposition instruction from the Service.

The Service contact is the Assistant Field Supervisor at 3310 El Camino Avenue, Suite 130, Sacramento, CA, 95821, (916) 979-2725. The CDFG contact is Ron Schlorff in the case of mammals, 1416 9th Street, Sacramento, CA, 95814, (916) 654-4262, or John Brode for reptiles and amphibians, (916) 358-2846.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Midway Valley is located between areas already identified for their biological significance and their critical importance to listed species recovery efforts: the Lokern Area is about 6 miles to the northeast; and DOE's NPR-2 is adjacent on the southeast. However, the biological resources of Midway Valley are not well documented. The Service believes that long-term management of listed species in the southern San Joaquin Valley would benefit from the data collected during and after the proposed activity. In that regard, the Service recommends the following:

1. Assemble within 4 months of the projects end, the listed and candidate species inventory data collected during project activities, and available landscape information, into a digitized format, making it available to other public agencies.

2. An evaluation of the impacts of the vibroseis exploration on the giant kangaroo rat burrows shall be conducted, if an applicable situation exists. This evaluation shall be comparable to, and the results compared with, the evaluation currently being conducted for the monitoring of the Belridge 3D seismic survey.

3. The Service recommends for future seismic projects, plant surveys for annual plants be performed during the spring when the plants are most apparent and that the furthest extent of the populations be mapped. To ensure adequate botanical surveys have been performed the Service recommends the following minimum guidelines:

   a) If a listed or proposed plant is known to occur within the same habitat and the area of the project is within the historic range of the special status plant, the botanist(s) performing the survey should: I) check nearby reference sites to observe the phenology of known populations. ii) make multiple site visits at the appropriate phenological stage during the year. Results should be documented by a written description of the reference site(s) including information on phenology and microhabitat information. Dates on which the surveys were performed should be included.

   b) The surveys should be floristic. They should not just be conducted to determine the presence or absence single rare plant species. A regional list comprised of several counties should be examined for plants occurring in the appropriate habitat. The site should also be surveyed and a complete species list provided.

Plants should be identified to the extent necessary to determine if they are rare or endangered (e.g., it is not adequate to just identify to genus, if there are any rare plants occurring in that genus).

c) A detailed description of the survey protocol used for including i) how the habitat on the site was inspected; ii) the dates the survey was performed during each of the years surveyed; iii) the reference sites, if any, that were visited; iv) the phenology of plants at the time of the survey; v) information on microhabitat information should also be included; and vi) complete species lists for the site. Detailed information should also be provided in any mitigation plan as well.

One of the goals in the recovery of listed plants in the San Joaquin Valley is to protect populations throughout the species' range, representing a variety of topographic positions and community types. Public lands will play an important role in the recovery of the listed species represented in this biological opinion. The Service would encourage BLM to participate in the recovery of San Joaquin Valley listed species by implementing the following conservation recommendations:

4. Promote surveys for presence of listed plant species on all linear projects throughout the San Joaquin Valley.

5. Unoccupied habitat within areas deemed essential to recovery should also receive a level of protection. This protection would cushion population fluctuations, encourage population expansion, and facilitate movement of pollinators and seed dispersers. The type of protection and areas to be protected should be developed with the Service.

6. Participate in reintroduction of listed species or seed collection in concert with the recovery needs of the species.

7. Assist in the monitoring of populations identified in the upcoming recovery plan.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed Midway Valley 3D Geophysical Exploration project requested on July 8, 1996. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate the cooperation of BLM, Chevron U.S.A., Inc., and Sante Fe Resources throughout this consultation process. Please contact Ms. Heather Bell of my staff at (916) 979-2728 extension 312, if you have questions or

comments on this biological opinion or further information concerning this project.

Sincerely,

Joel A. Medlin
Field Supervisor

cc: AES, Portland, OR
CDFG, Sacramento (R. Schlorff)
CDFG, Fresno, CA (J. Single)
SJVESRPP, Fresno, CA (P. Kelly)

REFERENCES

Literature Cited

Bureau of Land Management. 1993. *Eriastrum hooveri* Field Inventory. BLM, Caliente Resource Area, Bakersfield, CA. 116pp.

EASI. 1996. Endangered Species Program Naval Petroleum Reserve in California. Annual Report FY95. EG&G Energy Measurements, Las Vegas Area Operations, NV. 62pp.

EG&G Energy Measurements. 1995. Endangered Species Program Naval Petroleum Reserve in California. Annual Report FY94. EG&G Energy Measurements, Las Vegas Area Operations, NV. 59pp.

Hill, H. J. 1996. Monitoring giant kangaroo rats on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Hinshaw, J. M. 1996. Monitoring special status plants on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Otten, M. R. 1996. Monitoring of San Joaquin kit fox populations on the Naval Petroleum Reserves in California. Presented at Enterprise Advisory Services, Inc. NPRC Endangered Species and Cultural Resources Annual Program Review for 1995.

Single, J. R., D. J. Germano, and M. H. Wolfe. 1996. Decline of kangaroo rat populations during the winter of 1994-1995 in the souther San Joaquin Valley, California. Naval Petroleum Reserve Complex Endangered Species and Cultural Resources Annual Program Review, FY95. Unpubl. Rpt. 33 pp.

Skinner, M. W. And B. M. Pavlik. 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. Special Publications. Number 1, 5th Edition.

Tabor, S. P. And R. E. Thomas. 1995. Evaluation of impacts of the Belridge geophysical exploration project on small mammal burrows and the endangered plant, Kern mallow (*Eremalche kernensis*) in the Lokern Natural Area, Kern County, California. Prepared for BLM, by BioEnvironmental Associates, Bakersfield California. 15pp.

U.S. Fish and Wildlife Service. 1980. Blunt-nosed leopard lizard recovery plan. USFWS, Portland, OR. 76pp.

_____. 1983. San Joaquin kit fox recovery plan. Prepared by T.P. O'Farrell, EG&G Energy Measurements, Inc., for the USFWS, Portland, OR. 84pp.

_____. 1985. Blunt-nosed leopard lizard recovery plan revision. USFWS, Portland, OR. 85pp.

_____. 1995. Reinitiation of Formal Consultation Concerning Oil Production at Maximum Efficient Rate on Elk Hills Naval Petroleum Reserve, Kern County, California. USFWS, Sacramento, CA. 27pp.

_____. 1996. Recovery plan for arid upland and riparian species of the San Joaquin Valley, California. Preliminary draft. USFWS, Sacramento Field Office Sacramento, CA.

Personal Communications

Speigel, L. K. 1996. Personal Communication. Presentation of the California Energy Commission Research on the San Joaquin kit fox. Presented at the Western Section of the Wildlife Societies Chapter Meeting.

Cypher, E. 1996. Personal Communication. San Joaquin Valley Endangered Species Recovery Planning Program, Fresno, California.

FIGURE 1 - Location of the proposed Midway Valley 3D geophysical exploration project.

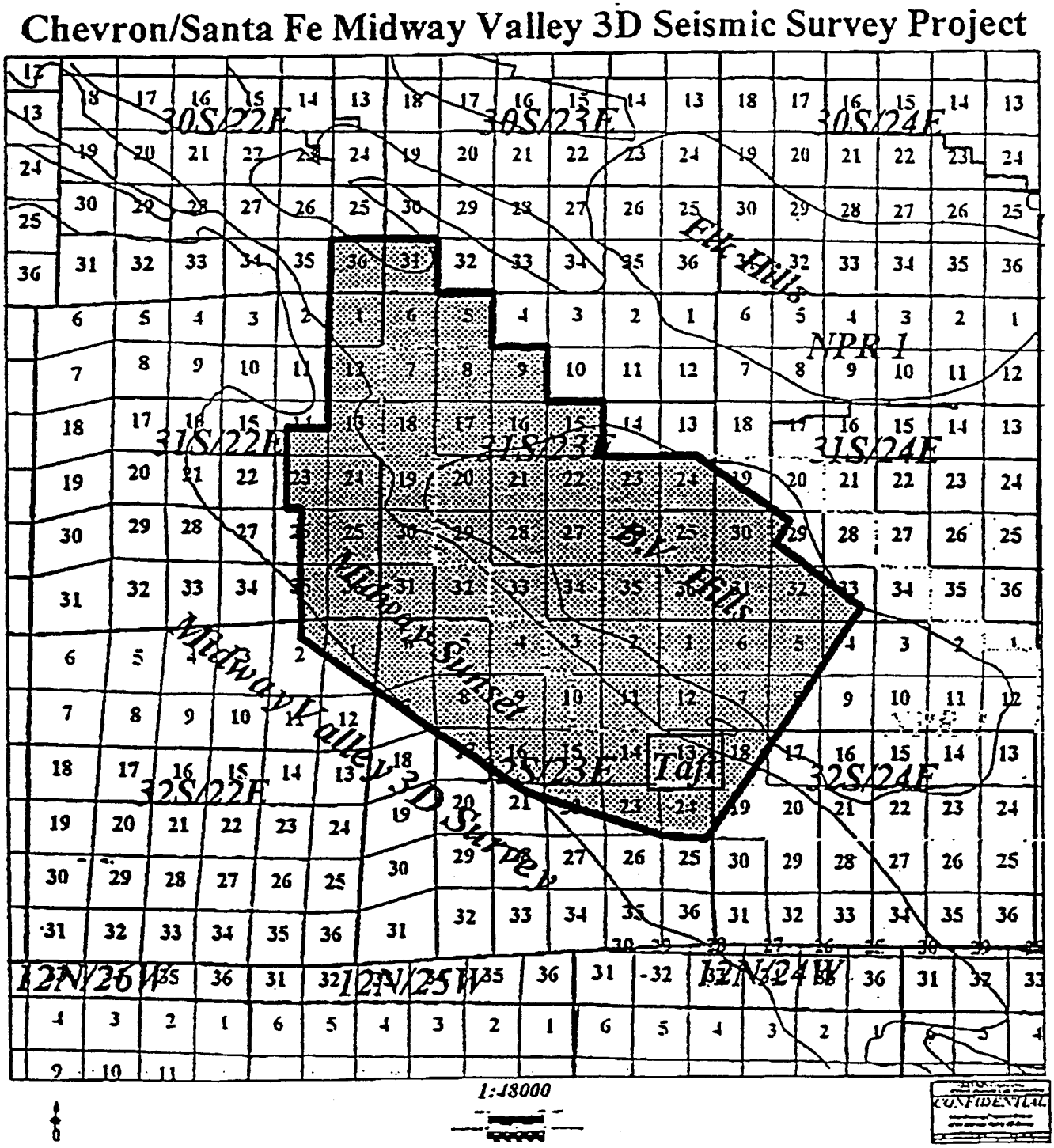
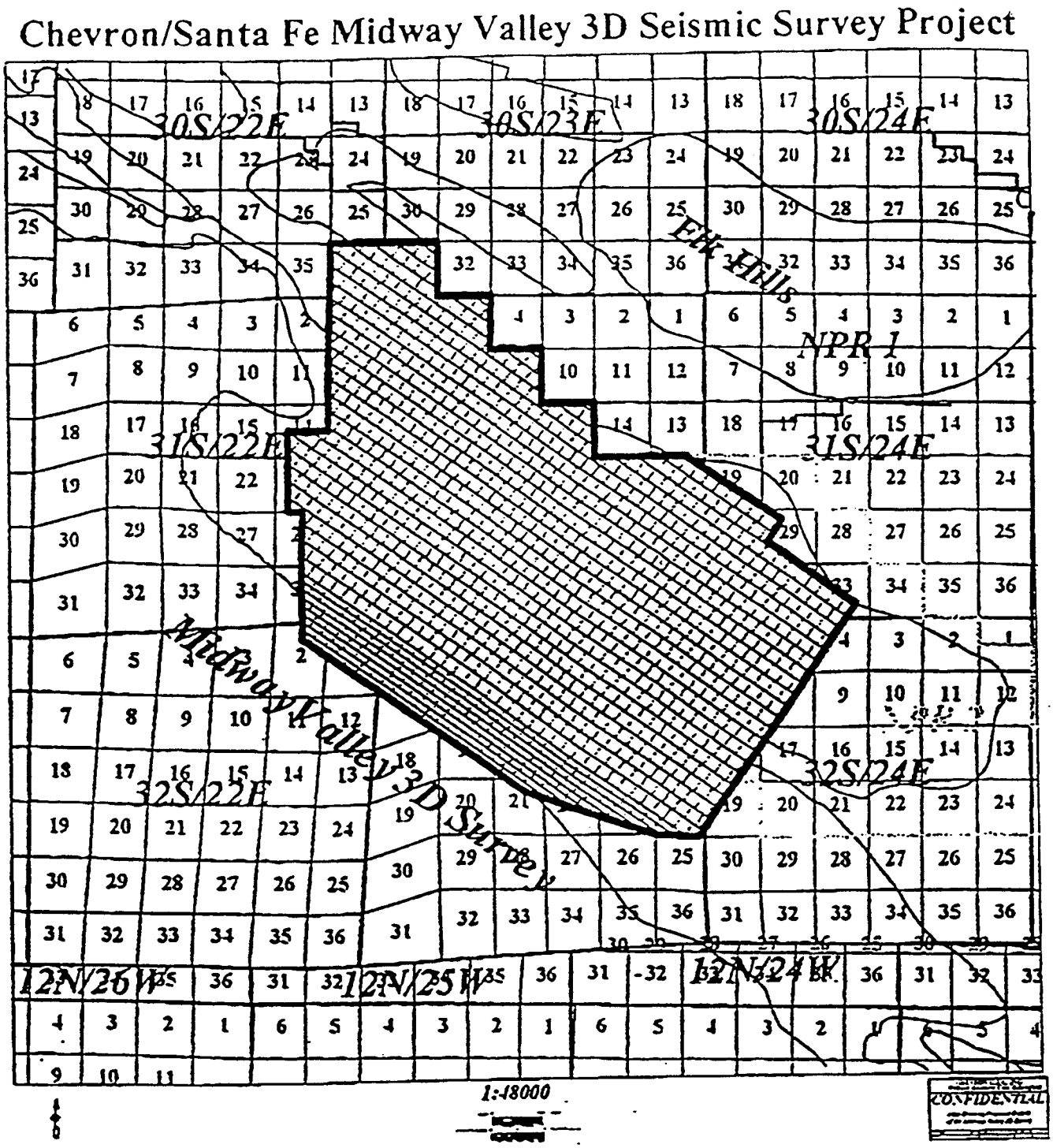


FIGURE 2 - Receiver and source line orientation for the proposed Midway Valley 3D geophysical exploration project.



APPENDIX A - BLM Memorandum and updated project description and biological evaluation.

BUREAU OF LAND MANAGEMENT
CALIENTE RESOURCE AREA

OCT 31 1996

MEMORANDUM

In Reply Refer To:
6840 (CA-010.3)

TO: Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Field Office, 3310 El Camino Ave. Sacramento, CA 95821-6340 Attn. Heather Bell

FROM: Area Manager, Caliente Resource Area, 3801 Pegasus Drive, Bakersfield, CA 93308

SUBJECT: Documentation for Midway Valley 3D Geophysical Exploration Project conducted by Chevron U.S.A., Inc. and Sante Fe Energy Resources in Western Kern County, California.

In response to your request to provide documentation of the changes in the Midway Valley 3D project description since we initiated Formal Section 7 Consultation, attached is the final project description and mitigation measures for the Midway Valley 3D project. This is the description that Chevron provided to the Bureau on 18 October as part of the NEPA document being prepared by the consultant and the BLM. This project description incorporates all the changes that have been provided to the Service through the various pieces of correspondence and phone conversations between the Service, Chevron and the Bureau.

We are providing you with this project description for your files to supersede all previous versions, including phone conversations and associated correspondence. We have not keep detailed documentation of all project changes that Chevron has made through their initiative or as a result of discussions about appropriate mitigation measures.

We hope that this documentation will fulfill your request since reconstruction of the previous events would be difficult.

We will be sending you a copy of the NEPA document for your files when the Record of Decision is signed. If you have any questions, please contact Larry Saslaw at (805) 391-6086.

Stephen Lamb

FS/DFS	ADMIN	CVPIA	EC	ESD	HC	WR

Heather B.

INTRODUCTION

The proposed Midway Valley 3D Geophysical Exploration Project covers approximately 31,444 acres of private lands, 6,880 acres of Department of Energy Lands within NPR2 and 3,840 acres of lands administered by the Bureau of Land Management, in western Kern County, California. A Biological Opinion for the proposed project has been rendered by the Acting Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Sacramento Field Office in Formal Section 7 Consultation with the Area Manager, Caliente Resource Area, U.S. Bureau of Land Management, Bakersfield, CA.

This environmental assessment presents an overview of the affected environment within the project area using results of a literature review of biological field surveys previously conducted within or adjacent to a proposed 3D seismic project. The purpose is to provide background information to identify potential and known locations of sensitive wildlife and special status plant species within the proposed seismic project area. Biological field surveys, following agency approved survey protocols, will be conducted during October through November 1996 to acquire current resource data to provide avoidance as the project is being implemented in the field.

The Midway Valley 3-D seismic project area is located in western Kern County, California. The approximately 66 square mile project area is bounded by the community of Derby Acres on its west-central border. The prospect includes the city of Taft along the southern boarder ranging north through the Buena Vista hills (NPR2) and northward across the Buena Vista Valley to the southern boundary of NPR1 (Elk Hills). The topography of the study area is generally flat from east to west, but rises into the Buena Vista Hills at its center.

Chevron U.S.A., Inc. and Santa Fe Energy Resources (Chevron/Santa Fe Energy) are proposing to conduct seismic investigations just southeast of the city of McKittrick and Derby Acres and in the Buena Vista and Midway Valleys, Kern County, California (Figure 1). Chevron/Santa Fe Energy's geophysical contractor will be Western Geophysical Corporation (Western Geophysical). In general, proposed seismic testing includes vibroseis using six truck equipped vibroseis units. All project related activities will be contained to existing roads and trails; cross country travel will occur only where roads and trails are not available, where sensitive resources can be avoided within the seismic corridors by vehicles, or where no listed resources occur within agency avoidance criteria within the 100 ft seismic corridor. Recording cables, geophones, and related equipment will be positioned over the project site while the project is in process.

Because the project is located in areas that may have potential to support populations of threatened and endangered species a biological survey is necessary to meet criteria of the federal endangered species act (ESA) of 1976 as amended, and the California endangered species act (CESA). The biological survey and assessment are conducted to assess potential impacts of project related activities to threatened and endangered plant and animal species and to provide mitigation to lessen impacts to listed species and their habitat(s).

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Chevron/Santa Fe Energy have proposed to conduct seismic investigations to obtain information about potential oil and gas deposits in the Midway Valley Area.

The proposed action requires the authorization from BLM and DOE for portions of the geophysical operation on federal lands (3,840 acres of BLM lands and 6,880 acres of DOE lands located within NPR2). Permits for land use and geophysical operation crossing were obtained by the seismic contractor for Chevron/Santa Fe prior to project related field operations.

Given that Chevron and Santa Fe are two of the largest oil field operators/land holders in the Midway Valley area, their joint approach to evaluation of acreage with 3D seismic data likely will result in a reduction in the number of future, separate, geophysical operations in the area. Hence, long-term impacts to listed species and their habitat will be minimized.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 NO-ACTION

Under the no-action alternative, the BLM and DOE would not allow seismic operations to be conducted on BLM and NPR-2 lands. Therefore the seismic project would be reduced in mineral and surface data acquistion.

2.2 PROPOSED ACTION

The project is proposed in three stages. Phase 1 will consist of five to six 2-man survey teams deploying temporary pin flags along the source and receiver lines. Agency approved biologists and archeologists will follow the surveyors and flag all areas where surface disturbing activities may affect listed wildlife and cultural resources. The biologists and archeologists will recommend minor re-routes so that project vehicles can adhere to agency approved avoidance criteria for listed biological and cultural resources.

Phase 2 will consist of placement of geophones and data collection. Light-weight, four- wheel, all-terrain vehicles (ATVs) and four-wheel drive trucks will be used to transport, deploy, and pick up the recording equipment. Geophone trucks will be used for geophone deployment and retrieval. This action is proposed along the same geophone lines that the vibrator trucks will follow. ATVs will be used for all additional travel to service and repair recording equipment at all off-road locations. In some cases, deployment of recording equipment would be completed by hand. Six truck mounted vibroseis units spaced 2-5 ft apart will proceed in single file along source lines generating seismic energy near the 8,426 source points. The lead vibrator truck will stop one truck length past the source point, all trucks will lower their pads and vibrate for 18 sec before moving forward approximately 7.5 ft to repeat the process. Each truck will lower its pad and vibrate 12 times at each source point. The collective vibrator pad depression at each source point has the potential to be 0-6 inches deep, 7 ft wide, and 165 ft long. After completing

vibrosels at all eight points along a source line segment, vibrator trucks will travel on the perpendicular geophone line for 1320 ft to reach the next set of eight source points and begin vibrating. The pads on the units are 7.25 ft. wide and 3.0 ft. long. All project vehicles, excluding vibrator trucks and vehicles deploying geophones, will be confined to existing roads except where practical. Phase 1 and Phase 2 would require a total of approximately 120 days to complete. The project is scheduled to begin in November of 1996 and should be completed by late February 1997.

Phase 3, project reclamation, will proceed concurrently with the completion of Phase 2 activities. All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications. BLM and DOE standard mitigation measures shall apply and are included as Appendix A.

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

Alternative locations to the proposed geophysical operation were considered during initial site selection. Such alternatives would require a request for larger surface area or a different seismic testing approach (large drilling trucks) thereby creating equal or greater potential impacts to endangered species habitat and cultural resources. The proponents decided not to pursure these options; further analysis was therefore dropped.

Chevron/Santa Fe could confine the project scope to private lands. Under this alternative, Chevron would be required to obtain a Section 10a permit from the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973, as amended. Impacts from the private lands alternative would be much the same as those for the proposed project except that they would not involve public land. The no-action alternative could increase the likelihood of future, individual seismic projects within the Midway Valley area. The tangible and intangible benefits of evaluating the resource potential of public lands would also not be realized.

3.0 AFFECTED ENVIRONMENT

3.1 PROPOSED ACTION

3.1.1 AIR QUALITY

Air quality in the Kern County region is considered marginal, with the San Joaquin Valley Air Basin being designated as a non-attainment area for two of the six criteria air pollutants (ozone and PM-10 [particulate matter less than 10 microns]) for which National Ambient Air Quality Standards (NAAQS) have been established. All DOE activities are governed by an extensive air pollutant permitting and monitoring program operated by the San Joaquin Valley Unified Air Pollution Control District.

PROPOSED MITIGATION MEASURES

All pin flags, flagging and trash will be collected daily as the project progresses. Off-road vehicle travel paths will be reclaimed according to agency specifications.

A. Vibroseis avoidance criteria for off-road locations:

- 200 feet from occupied San Joaquin kit fox natal dens;
- 150 feet from known San Joaquin kit fox natal dens;
- 100 feet from occupied San Joaquin kit fox dens;
- 100 feet from known San Joaquin kit fox dens;
- 50 feet from potential San Joaquin kit fox dens;
- ~~50~~ 90 feet from giant kangaroo rat burrow systems;
- 30 feet from burrows where San Joaquin antelope squirrel burrows;
- 30 feet from occupied blunt-nosed leopard lizard burrows;
- 30 feet from badger dens;
- 30 feet from burrowing owl burrows;

B. Access route avoidance criterion for off-road vehicle travel:

- No sensitive wildlife resources within a 50-foot corridor along access routes and receiver lines.

C. The seismic contractor shall test to determine when vehicles can commence activity after the area receives measurable rainfall. The result of soil compaction is a decrease in volume. This decrease can be quantified by measuring the depth of the depression left by the compacting instrument. During the first day of seismic testing, with soil in a dry condition, the project biologist will measure the depth of tire tracks and all vibroseis pad depressions at 20 source points. After measurable rainfall, when surface soils are no longer in a saturated condition, the biologist will measure tire and all vibrator pad depressions at the first source point of the day. If depth measurements of tire tracks and vibroseis pad depressions are more than 75% greater than average measurement taken in dry soil, all off-road vehicle travel will be suspended until conditions improve.

D. Geophones will be placed on BLM lands in the following manner:

1) All vehicles will avoid driving on areas of cryptogamic soils.

2) The geophones will be walked across cryptogamic soils and areas identified as having high densities of listed plants and deployed by hand in the field.

3) If necessary, biological monitors will be on-site during geophone placement to identify sensitive areas to avoid.

4) Selected geophone lines may be marked on BLM lands to provide line location for post-project monitoring.

E. All source points in areas, on BLM lands, that are found to have high densities of listed plants will be relocated.

F. No off-road vehicle travel (except by ATVs) in areas found to have any densities of listed plants. Vibrator trucks will follow flagged routes around areas of listed plants on BLM lands. A 50 foot avoidance zone for Hoover's wooly star will be enforced.

G. To minimize the potential for incidental take of the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat (some of the measures have been modified to reflect the current proposed seismic methodology):

1) The potential for harm or mortality to San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats should be minimized.

2) The potential for inadvertent entrapment of San Joaquin kit foxes, blunt-nosed leopard lizards and giant kangaroo rats in dens and burrows should be minimized.

3) The extent of off-road survey routes and other seismic testing areas should be minimized.

4) The potential for unauthorized vehicle use of off-road survey routes should be minimized.

H. The seismic contractor should provide compliance with the following terms and conditions, which implement the reasonable and prudent measures described above:

1) The potential for harm or mortality to listed wildlife species and their habitats should be minimized by implementing the following procedures:

a) All measures as proposed by USFWS (1996) for the Chevron/Santa Fe Midway Valley 3D seismic project should be followed. Mitigation below incorporates such

measures requirements of the proposed Midway Valley 3D seismic project.

b) Prior to the onset of ground-disturbing project activities, a qualified wildlife biologist should brief all project personnel on the occurrence and distribution of listed species in the project area, measures being implemented to protect these species during project actions, reporting requirements should incidental take occur, and applicable definitions and prohibitions under the Act.

c) Within 4 weeks prior to commencement of seismic testing activities, a qualified biologist(s) should conduct preactivity surveys of proposed vibrator and geophone travel paths. During pre-activity surveys, the status of previous surveys should be reviewed; San Joaquin kit fox dens and kangaroo rat and leopard lizard burrows should be flagged for avoidance, as necessary; and additional habitat features, if any, should be identified and flagged as necessary.

d) Biological monitors should accompany seismic survey vehicles and crews throughout the project area at all times that activities with the potential to affect listed species are being conducted. Biological monitors may conduct preactivity surveys as described above; should aid seismic crews in satisfying avoidance criteria and implementing project mitigation as described in this evaluation; should aid seismic crews in relocating shot and geophone lines as necessary; should observe and note all pertinent information concerning project effects on listed species; and in general should assist the seismic contractor in conducting the proposed project in such a manner as to minimize adverse effects on endangered and threatened species. At least one biological monitor should accompany the vibrator crew working within endangered species habitat.

e) Pets should not be permitted on the project site during project activities.

f) All food-related trash such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers only and regularly removed from the project site.

g) All spills of hazardous materials within endangered species habitats should be cleaned up immediately per SPCC plans.

h) Daily preparation needed prior to sunrise, and end of day maintenance will be conducted no earlier than two hours before sunrise and not later than two hours after sunset.

i) All project-related vehicles should observe a speed limit of 20 mph or less on all routes that traverse endangered species habitat, except on State and County highways and road.

i) Within 45 calendar days after completion of the project, the seismic contractor should submit to the Service and the BLM a post-activity compliance report that details the following information: dates that seismic testing occurred; pertinent data concerning the seismic contractor's success in meeting project mitigation measures, if any; known project effects on San Joaquin kit foxes, blunt-nosed leopard lizards, and giant kangaroo rats, if any (including specific number of dens and small mammal burrows damaged or destroyed); occurrences of incidental take of federally listed species, if any; an assessment of the extent and severity of project impacts on all sensitive wildlife habitats, a summary of rehabilitation plans, if any; and other pertinent information.

2) All known and potential San Joaquin kit foxes dens, giant kangaroo rat burrows, and burrows potentially inhabited by blunt-nosed leopard lizards should be protected by implementing the following procedures. Such protection will help prevent incidental take of dens and burrows in excess of the take limits described above.

a) All project vehicles should observe travel avoidance routes describe in the biological preactivity survey notes that provide avoidance for sensitive wildlife and special status plant resources, unless alterations to these routes are expressly allowed by the biological monitors.

b) To minimize effects of geophone deployment, the applicant should utilize approved travel corridors along geophone lines to deploy all off-road geophone lines that occur within endangered species habitat. No vehicles other than geophone deployment vehicles should be used to deploy geophones in such areas. During geophone deployment, work crews should make every reasonable effort to avoid sensitive habitat areas such as dens, burrows, and cryptogamic crusts. To the maximum extent practicable, geophone vehicle operators should avoid such habitat areas by 10 feet. One biological monitor exclusive of monitors observing vibrator crew activities should oversee the activities of geophone line deployment crews.

c) All avoidable San Joaquin kit fox dens and kangaroo rat and blunt-nosed leopard lizard burrows within the immediate vicinity of survey routes should be prominently staked and/or flagged as necessary to alert project personnel to their presence. All project-related flagging should be collected and removed after completion of the project.

d) The applicant should make every reasonable effort to prevent the collapse of dens and burrows by relocating source points to avoid dens and burrows or other means as determined to be appropriate.

e) Project biological monitors should keep an accurate and running tally of the number

of dens and burrows damages, destroyed, or otherwise affected by project activities. Such tallies should be combined and totaled at the end of each work day to determine proximity to take limits and the need for subsequent project modifications to prevent den and burrow effects in excess of take limits. Total number of dens and burrows affected by the project should be reported in the post-activity compliance report.

f) If damage or destruction to a known San Joaquin kit fox den cannot be avoided during project activities, the BLM, DOE, and USFWS should be contacted immediately for guidance. Potential kit fox dens that cannot be avoided during project activities may be excavated and backfilled pursuant to Service guidelines without prior notification, provided that excavation is approved and supervised by a project biological monitor and that such excavation is within incidental take limits provided in the projects biological opinion. Destruction of all kit fox dens shall be reported in the post-activity compliance report.

3) The extent of off-road survey routes and other seismic testing areas should be minimized by implementing the following procedures:

a) Where seismic lines cross threatened or endangered species habitat, the survey corridor within which testing and ancillary vehicles operate should be limited to a maximum width of 50 feet (25 feet on either side of the center line). These testing activity zones should be reduced, where possible, to avoid endangered species sites such as occupied kit fox dens or kangaroo rat burrows.

b) Project related vehicles should be confined to existing primary or secondary roads or to specifically delineated project areas (i.e., areas that have been surveyed and described in existing documentation). Otherwise, no off-road vehicle travel should be permitted.

1) Unauthorized vehicle use of off-road survey routes should be minimized by implementing appropriate measures to prevent unauthorized entry to off-road survey routes, including placement of gates or fences where these routes intersect existing roads, and posting of signs stating that access is not permitted.

I. The following general and specific measures should be implemented to avoid potential adverse impacts to candidate and California species of special concern and their habitats:

San Joaquin Antelope Squirrel - Impacts can be avoided by staying to the flagged route and avoiding the burrows as marked in the field. In addition, a biologist is recommended to assist project related vibroseis and geophone truck cross country travel so as avoid sensitive resources (burrows) and their habitat(s).

Blunt-nosed leopard lizard - The project area is within the known range of blunt-nosed leopard lizards. Project impacts to blunt-nosed leopard lizard habitat could result from habitat being temporarily destroyed (crushed shrubs and vegetation that serve as loafing cover). This type of impact may be lessened by having a flagged route that vehicles should follow through areas of low density shrubs and other vegetation. Shrubs and burrows should be avoided to reduce impacts to over-wintering blunt-nosed leopard lizards.

The potential for moving vehicle encounters with blunt-nosed leopard lizards is unlikely given that the project takes place during the winter underground period (November-February). Project activities will be conducted during daylight hours when lizard activity is optimum. Impacts to this species could result from lizards being crushed by vehicle traffic. In addition, vibration induced collapse of burrows is a low impact potential if avoidance criteria are complied with. Blunt-nosed leopard lizard impacts will be minimized using the following measures:

a. Check surrounding land uses and disturbance for suitable leopard lizard habitat, and
b. Check percent slope, and
c. Check vegetation density, and
d. Check availability of burrows for refuge

Loggerhead Shrike - Loss of foraging and nesting habitat for the Shrike may result if large shrubs with nests are driven over. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Le Conte's Thrasher - Loss of potential foraging and nesting habitat for Le Conte's thrashers may result if shrubs with nests are driven over. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Burrowing Owl - Loss of foraging and nesting habitat for burrowing owls may result as the seismic travel corridor is being used. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related vehicles and reduce impacts to shrubs adjacent to these sites.

Short-eared Owl - This species can fly out of imminent danger, though nesting areas remain vulnerable to seismic travel corridors. Preactivity surveys should include a thorough inspection of the proposed seismic travel corridor and proposed access travel paths to ensure that nests of this species are not destroyed. Young owls are especially vulnerable to collisions with vehicles, particularly during foraging bouts. Increased disturbance and mortality would lower breeding success, and may cause the owls to abandon the site. Seismic travel corridors should be clearly delineated during the seismic project so as to contain project related

APPENDIX C

STATE HISTORIC PRESERVATION OFFICE CONSULTATION AND ARCHEOLOGICAL ASSESSMENT

ATE OF CALIFORNIA — THE RESOURCES AGENCY
OFFICE OF HISTORIC PRESERVATION
EPARTMENT OF PARKS AND RECREATION
.O. BOX 942896
SACRAMENTO 94296-0001
6) 653-6624
X: (916) 653-9824

PETE WILSON, *Governor*

November 26, 1996

REPLY TO: BLM961104A

Ron Fellows, District Manager
Bureau of Land Management
Bakersfield District Office
3801 Pegasus Drive
BAKERSFIELD CA 93308-

Project: 3D Seismic survey, Kern and San Luis Obispo Counties

Dear Mr. Fellows:

The State Historic Preservation Officer (SHPO) has reviewed and provides the following comments on the documentation you submitted in accordance with our Programmatic Agreement (PA).

Your letter provided sufficient detail explaining the intricacies of the project for me to clearly understand all aspects of this undertaking. I appreciate your effort because it simplifies my review and reduces the time need to complete this process.

Your letter has set forth the conditions under which you will satisfy the requirements of Stipulation 2A. You have assured me that the undertaking is designed in such a manner that it will result in no effect. As such, you have satisfied the requirements of Stipulations 2C1 and 2C2. I will look forward to reviewing the results of your inventory efforts.

Your consideration of historic properties in the project planning process is appreciated. If you have any questions regarding our review of this undertaking, please call Gary Reinoehl of our staff at (916) 653-5099.

Sincerely,

Cherilyn Widell
State Historic Preservation Officer

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Bakersfield District Office
3801 Pegasus Drive
Bakersfield, California 93308-6837

8100
CA-016.7

CERTIFIED MAIL NO. P 067 521 317
RETURN RECEIPT REQUESTED

NOV 1 1996

MS CHERILYN WIDELL
STATE HISTORIC PRESERVATION OFFICER
OFFICE OF HISTORIC PRESERVATION
P O BOX 942896
SACRAMENTO CA 94296-0001

Dear Ms. Widell:

In accordance with our Programmatic Agreement (PA), we are providing information pertinent to the geophysical exploration project (seismic survey) proposed jointly by Chevron U.S.A. and Santa Fe Energy Resources. As previously discussed between Gary Reinoehl and Duane Christian, the three dimensional(3D) seismic survey project is located in the Midway Valley in western Kern County and a small portion in eastern San Luis Obispo County, California. The seismic project encompasses approximately 42,163 acres of land or 66 square miles. Acreage consist of 31,443 acres of private land, 6,880 acres of Department of Energy (DOE) land within the Elk Hills National Petroleum Reserve 2, and 3,840 acres of land administered by the Bureau if Land Management (BLM). Enclosed map(Figure 1) delineates the project boundary. The BLM will serve as lead Federal agency in terms of compliance with Section 106 of the National Historic Preservation Act in cooperation with DOE.

Please keep specific information about the seismic operations confidential. Chevron and Santa Fe have contracted Western Geophysical to conduct the 3D seismic survey. The project involves establishing approximately 30 lines of receiver stations (geophones) and 95 source (vibroseis) lines positioned in a staggered pattern (Figure 2). Geophone lines will be placed 1,320 feet apart oriented in a northwest to southeast alignment. Source lines will consist of eight vibroseis or source points, positioned 165 feet apart in a staggered or brick pattern perpendicular to the receiver stations. Source lines will be oriented in a northeast to southwest alignment. There are approximately 8,426 source points spaced 165 feet apart and 8,546 geophone stations spaced 165 feet apart. Thus, the sum total of lines will be approximately 530 miles consisting 263 miles of source lines and 267 miles of geophone lines. Six truck mounted vibroseis units will create ground vibrations necessary to collect the seismic data. It is anticipated that the project source and geophone lines operations will be confined to a width of 50 feet or less. Thus, the maximum

Area of Potential Effect (APE) from this undertaking is approximately 3,212 acres or less. Additionally, the project will be on existing roads and streets for about 20% of the project, thereby reducing acres of potential ground disturbance.

The Cultural Resources Facility located at California State University of Bakersfield (CSUB), under a cultural permit with BLM, will be conducting an intensive archaeological inventory of all source and geophone linear corridors by covering a 100 foot wide swath of land on all proposed and realigned corridors. The archaeological inventory will cover approximately 6,424 acres. We consider this approach to fully cover the APE for the proposed undertaking.

A record search conducted at the San Joaquin Valley Archaeological Information Center at CSUB and U. C. Santa Barbara revealed an estimated 10% of the acreage culturally surveyed at various levels of intensity within the project boundary. One hundred thirty two (132) archaeological sites are known within the boundary encompassing the project area (66 square miles). Of these sites one hundred twenty six (126) are historical, the majority of these are associated with oil and gas exploration and development. Six of the archaeological sites are prehistoric. Within the city of Taft, there are two California Points of Historic Interest and one National Register of Historic Places property; the "Fort", the "Jameson 17-24-C Oil Well", and "The Security Trust Company Building" respectively. However, none of these sites are identified to be within the proposed linear corridors.

All historic and prehistoric sites will be flagged and avoided at a safe distance to assure no direct or secondary disturbance. When surveys identify cultural resources to be present within any project linear corridor, the seismic crew surveyors will realign the geophone and source lines to avoid cultural resources. A summary of measures are provided to assure cultural resources are safely avoided by project activities and personnel:

1. Prior to initiation of field work, all field supervisors and personnel shall be briefed by an archaeologist or cultural specialist about the region's general cultural background and sensitivity of cultural resources in the project vicinity. The cultural monitor(s) shall inform project personnel to avoid flagged areas, not to collect or disturb artifacts, and to report any late discovery of cultural resources in the project vicinity to the cultural monitor.

2. Once land surveyors pin flag the center line of the geophone and source lines, an intensive cultural inventory on all seismic corridors will be conducted in advance of land disturbing activities; e.g., vibroseis trucks, cross country vehicles etc.

3. All cultural sites will be flagged for avoidance including a safe buffer zone to prevent any disturbance to them and

monitored for compliance by an archaeologist or cultural resource specialist. Once seismic activities in the area cease, flagging will be removed.

4. Cultural monitors shall be present during all potentially damaging project activities that are near cultural resources unless flagging alone is determined sufficient for avoidance. The project monitors shall assist field personnel in avoiding disturbance to cultural sites.

5. Should any disturbance occur to cultural resources during the project, it shall be immediately reported to the BLM archaeologist. All work in the immediate area of disturbance shall cease until approval to proceed is given by the BLM authorized officer, subsequent to completion of cultural compliance.

6. The archaeological contractor will provide at a minimum a weekly status report to BLM on project progress or more frequently should problems arise. The report will at a minimum include the number of miles surveyed, number of sites discovered and recorded or updated, areas where vibroseis activities have been completed, the number of sites flagged for avoidance, and the results of monitoring activities.

7. After completion of the project, a complete archaeological report with the results of the cultural investigation, the number of sites avoided, and an assessment of monitoring activities will be provided to the SHPO.

Based on a number of past geophysical projects taken place in the southern San Joaquin Valley over the past several years, we have found the use of site avoidance of cultural resource to be successful. Avoidance measures have consisted of either shifting the seismic line operations in a lateral direction away from cultural sites or by skipping over segment(s) of the seismic line. Thus, seismic trucks and other support vehicles such as pickups or ATVs could safely avoid cultural properties. To assure cultural sites were avoided, flagging was used to delineate avoidance areas and sites were monitored by an archaeologist or cultural specialist. Once seismic activities ceased in the project area, flagging was removed from the site(s).

Because cultural resource avoidance will be required for all sites on this project, we prefer to waive site assessment and determination of eligibility for this undertaking. With implementation of the avoidance and monitoring measures for the proposed project, we are requesting your concurrence in the agency's determination of **no effect** to cultural resources. Consequently, no historic properties exist within the APE, and the subject undertaking will have no effect on National Register listed or eligible properties.

Native American notification letters regarding this project were mailed out on October 3, 1996. To date, we have received no response from the Native Americans. Should we receive any response, their comments will be addressed in the environmental assessment report. A copy of the correspondence and a mailing list of groups contacted are enclosed for your reference. Should you have any questions, please contact Duane Christian at (805) 391-6080.

Sincerely,

Ron Fellows
District Manager

Enclosures:
Figure 1, 2 (2 pp)
Native American Letter (4 pp)

cc:
Mr. O. Jay Williams
Acting Director
Department of Energy
Naval Petroleum Reserves in California
P.O. Box 11
Tupman, CA 93276 (w/enc)

Mr. William C. Kempner
Chevron U.S.A.
Production Company
P.O. Box 1392
Bakersfield, CA 93302 (w/enc)

Mr. Jim Robinson
Santa Fe Energy Company
4900 California Avenue
Tower A, Suite 400
Bakersfield, CA 93309 (w/enc)

Mr. Robert E. Parr
Cultural Resource Facility
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099 (w/enc)

bcc:
James Abbott (w/enc)
Russ Lewis (w/enc)
Russ Kaldenberg, CA-930.5 (w/enc)

DChristian/dwc:10/31/96 (w/enc)

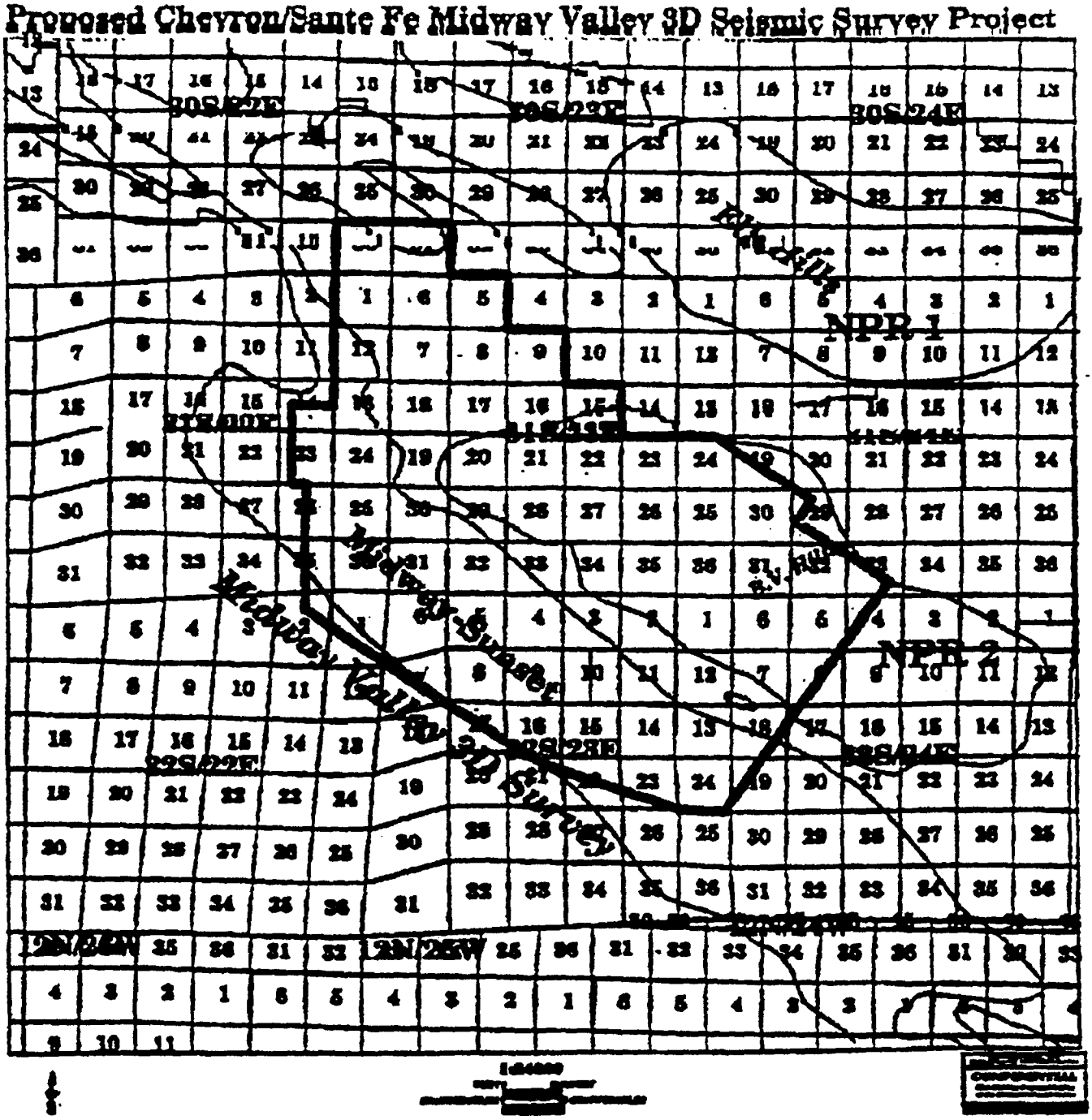


Figure 1. Regional location of the Chevron U.S.A./Santa Fe Energy Resources proposed Midway Valley 3D seismic project. The seismic project boundary is delineated by the dark bold line. The seismic project includes the city of Taft, portions of the Naval Petroleum Reserve #2 (Buena Vista Hills and Valley), and portions of the Midway-Sunset oilfield.

Midway Valley 3D Survey Project

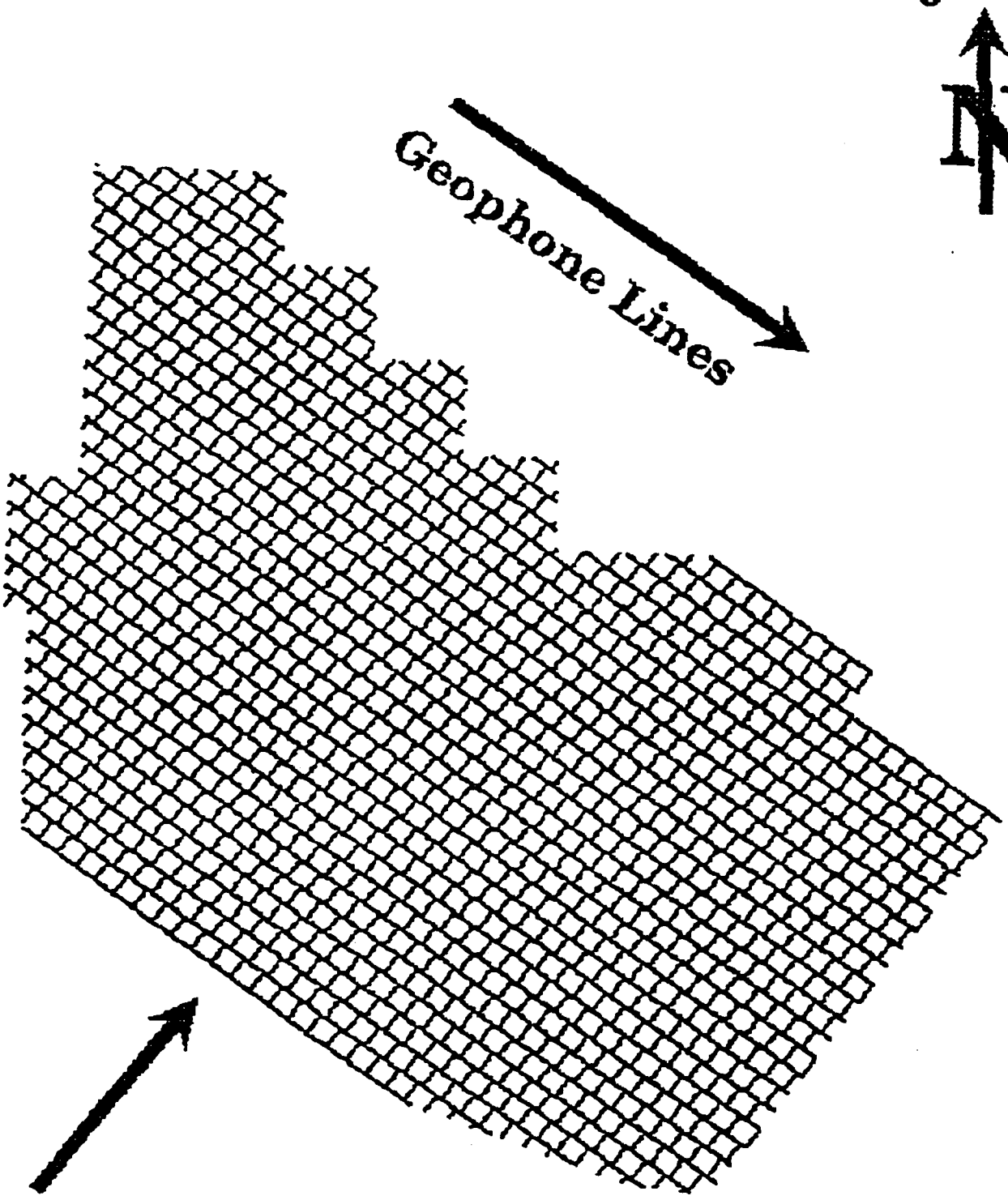


FIGURE 2

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Caliente Resource Area
3801 Pegasus Drive
Bakersfield, California 93308-6837

8100
CA-016.7

CERTIFIED MAIL NO. P 067 521 318
RETURN RECEIPT REQUESTED

3 1998

Duane M. Garfield Sr., Chairperson
Tule River Reservation
P.O. Box 589
Porterville, CA 93258

Dear Mr. Garfield:

The Bureau of Land Management has received from Chevron U.S.A. and Santa Fe Energy Resources a Notice of Intent to conduct oil and gas geophysical exploration operations (seismic survey). The three dimensional (3D) seismic survey project is located in the Midway Valley in western Kern County and a small portion in eastern San Luis Obispo County, California. The seismic project encompasses approximately 42,163 acres of land or 66 square miles. Acreage consist of 31,443 acres of private land, 6,880 acres of Department of Energy (DOE) land within the Elk Hills National Petroleum Reserve 2, and 3,840 acres of land administered by the Bureau if Land Management (BLM). Enclosed map (Figure 1) delineates the project boundary.

Please keep specific information about the seismic operation confidential. Chevron and Santa Fe have contracted Western Geophysical to conduct the 3D seismic survey. The project involves establishing approximately 30 lines of receiver stations (geophones) and 95 source (vibroseis) lines positioned in a staggered pattern. Figure 2 is enclosed for your reference. Geophone lines will be placed 1,320 feet apart oriented in a norhwest to southeast alignment. Source lines will be oriented in a northeast to southwest alignment and positioned 165 feet apart perpendicular to the receiver stations. The sum total of project lines will be approximately 530 miles consisting of 263 miles of source lines and 267 miles of geophone lines. Truck mounted vibroseis units will create ground vibrations necessary to collect the seismic data. It is anticipated that the project source and geophone line corridors will be confined to a width of 50 feet or less. Thus, the proposed seismic ground operations will involve approximately 3,212 acres or less.

The cultural resources survey will be conducted by the Cultural

Resources Facility located at the California State University, Bakersfield (CSUB). The principal individual responsible for the archaeological survey, implementation of site avoidance and monitoring, and the final cultural report will be Mr. Robert E. Parr. An intensive archaeological inventory of all source and geophone linear corridors will be conducted by covering a 100 foot wide swath of all lines. The archaeological inventory will cover approximately 6,424 acres. All cultural sites within the seismic corridors will be avoided by project realignment and monitored to assure no disturbance.

A cultural record search at the Southern San Joaquin Valley Information Center at CSUB revealed the presence of six previously recorded prehistoric sites within the boundary of the project overall. These sites are summarized below for your information.

CA-KER-659: hearth feature with mano; located in Section 24, T. 31 S., R. 23 E.

CA-KER-662: rock-lined hearth, three fire-affected rock concentrations, stone core; located in Sections 13 & 24, T. 31 S., R. 23 E.

CA-KER-2160: lithic scatter; Sections 1 & 2, T. 31 S., R. 22 E.

CA-KER-2463: lithic scatter with flakes, cores, ground stone; Section 32, T. 30 S., R. 23 E.

CA-KER-3136: midden exposed in wash; flaked stone, ground stone, carbon, unidentified bone fragments; located in Sections 7 & 8, T. 32 S., R. 23 E.

CA-KER-3161: lithic scatter with some shell fragments; Section 18, T. 32 S., R. 24 E.

As noted above all previously recorded and new sites discovered during the inventory will be avoided by project activities. Thus, there will be no disturbance to archaeological sites nor will there be any artifact collecting, testing, or excavation of sites.

We are requesting your comments should you have any specific Native American cultural or religious concerns pertinent to the proposed geophysical exploration project area. This request is in accordance with the National Historic Preservation Act of 1966 (P.L.89-665) and the Native American Religious Freedom Act of 1978. The National Historic Preservation Act Amendments in 1992 (Title III, Sec. 304) protects from public disclosure the release of information which may pose a risk to a historic resource or traditional Native American cultural property.

Should you have any specific concerns in regard to this undertaking, please notify me within thirty (30) days after receiving this letter. If we have not heard from you or a

representative within this time period, we will proceed with the project as proposed. If you have any questions, please contact Duane Christian at (805) 391-6080.

Sincerely,

Steve Larson

James Wesley Abbott
Area Manager

Enclosure:
As stated (2 pp)

cc:
Mr. Larry Myers, Executive Secretary
Native American Heritage Commission
915 Catitol Mall, Room 288
Sacramento, CA 95814

Mr. O. Jay Williams
Acting Director
Department of Energy
Naval Petroleum Reserves in California
P.O. Box 11
Tupman, CA 93276

Mr. William C. Kempner
Chevron U.S.A.
Production Company
P.O. Box 1392
Bakersfield, CA 93302

Mr. Jim Robinson
Santa Fe Energy Company
4900 California Avenue
Tower A, Suite 400
Bakersfield, CA 93309

Mr. Robert E. Parr
Cultural Resource Facility
California State University Bakersfield
9001 Stockdale Highway
Bakersfield, CA 93311-1099

Native American Notification List
Chevron U.S.A./Santa Fe Energy Resources
3D Seismic Exploration Project

J. R. Manuel, President
Native American Heritage Preservation Council
P.O. Box 1507
Bakersfield, Ca 93302

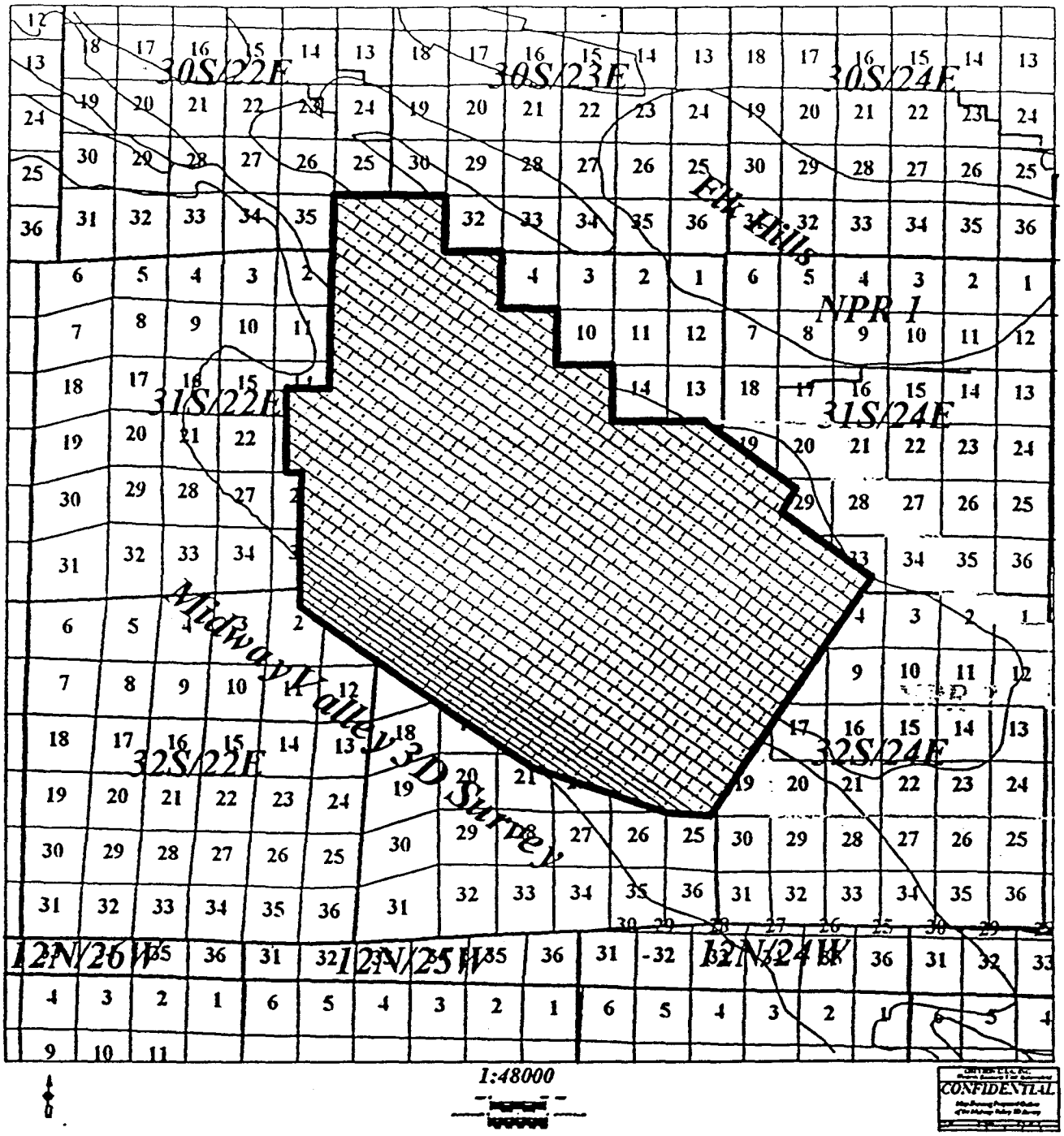
Clarence Atwell Jr., Chairperson
Santa Rosa Rancheria
P.O.Box 8
Lemoore, CA 93245

Duane M. Garfield Sr., Chairperson
Tule River Reservation
P.O.Box 589
Porterville, CA 93258

cc:

Larry Myers, Executive Secretary
Native American Heritage Commission
915 Capitol Mall, Room 288
Sacramento, CA 95814

Chevron/Santa Fe Midway Valley 3D Seismic Survey Project



Receiver line orientation

Source line orientation