Biological Assessment for Threatened and Endangered Species of the Southern Santa Maria Basin with respect to Proposed Oil and Gas Development and Production Offshore Point Conception and Point Arguello, Santa Barbara County, California

Prepared in Accordance with Section 7 (c)
Endangered Species Act of 1973, as amended
For Consideration by the Point Arguello Field
and Gaviota Processing Facility; Area Study,
and Chevron/Texaco Development Plans EIS/EIR

by
Environmental Operations Section
Office of Leasing and Environment
Pacific OCS Region
Minerals Management Service

January 1984

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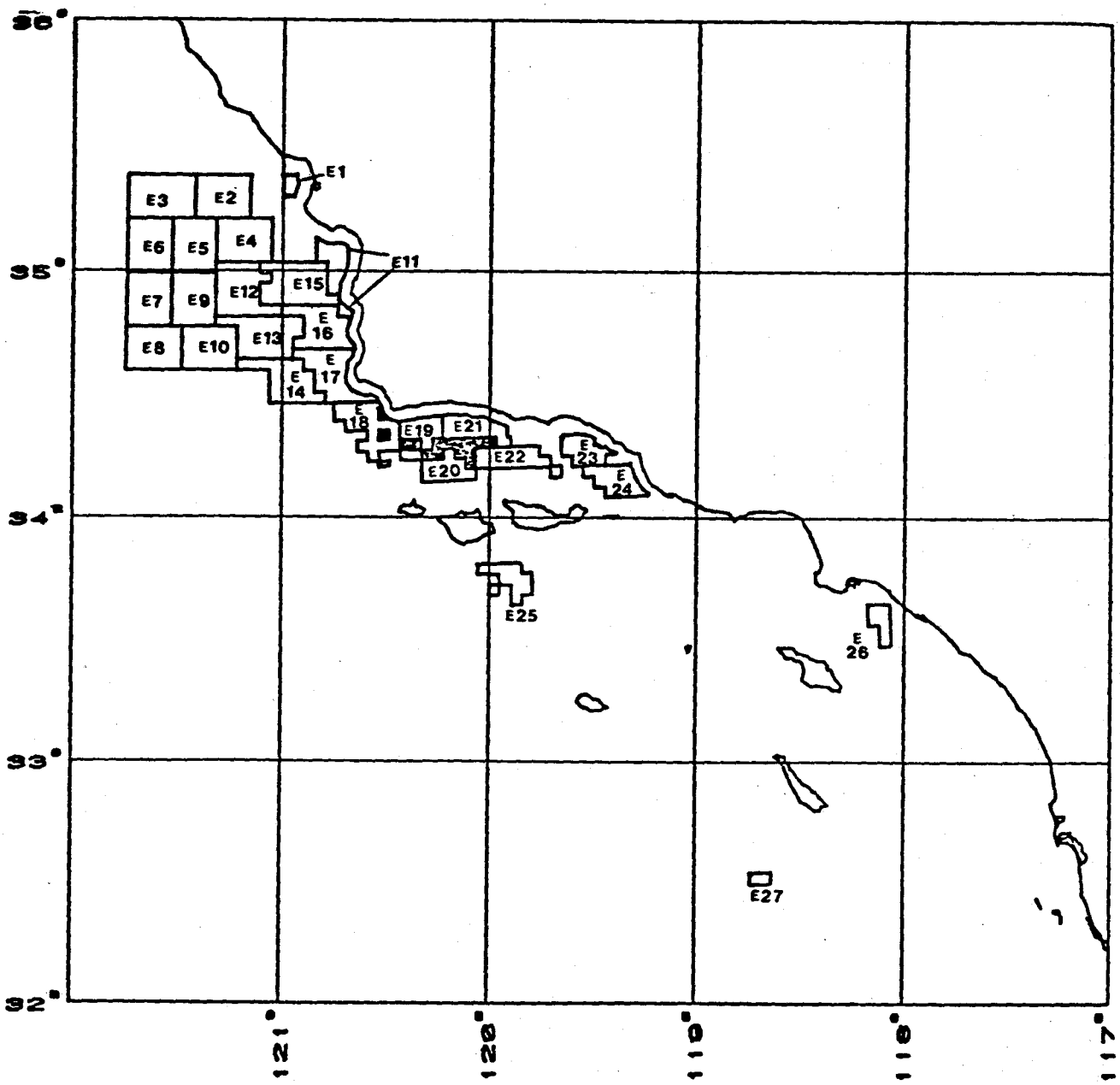


Figure IV. A.4-9. Map showing the existing Federal lease tract groups (E1-E27) in the study area.

I. Summary

Chevron, U.S.A., Inc. and Texaco, Inc. have submitted Development and Production Plans (DPPs) for the Point Arguello Field to the Minerals Management Service, Pacific OCS Region Office. As a result of these and anticipated future DPPs for the Point Arguello Field and adjacent leases, the MMS intends to prepare an Area-Wide EIS/EIR jointly with the County of Santa Barbara, the California State Lands Commission, and the California Coastal Commission.

To completely develop the Point Arguello Field, Chevron is proposing to install two platforms, one on lease OCS-P 0316 and one on lease OCS-P 0450. Texaco is proposing to install one platform on lease OCS-P 0315. Chevron is also proposing a consolidated 200,000 barrel per day capacity oil pipeline, and a 160 million standard cubic feet per day capacity gas line from Platform Hermosa to the proposed Gaviota processing facility. These consolidated pipelines and facilities were proposed to minimize environmental impacts both offshore and onshore and to address the State of California's concerns. Due to the capacity of the pipelines to shore and the potential for future development on nearby leases, the MMS believes an area larger than the Point Arguello Field should be considered for environmental analysis. Accordingly, the MMS has identified a 25 Federal lease area offshore between Pt. Conception and Pt. Arguello, and has included possible locations for an additional five platforms and pipelines within this Area Study. Assumptions related to the placement of these platforms have been provided in this document. Therefore, although the proposed project is for three platforms, associated pipelines, and an onshore facility, this Biological Assessment and the requested Biological Opinions will consider the potential for eight platforms and associated pipelines in this area. Any

reference to "the proposal" or "the proposed project" in this document is to be equated with the eight platform scenario.

For the purposes of environmental analysis, MMS has calculated reserve estimates and production rates for the 25-lease area. A total of 400 million barrels (bbls) of oil is estimated to be produced by eight platforms over a 30-year period. Installation of the first platforms are expected in late spring 1985. Production is proposed to begin in 1986.

A list of rare, threatened or endangered species which may be affected by the development off Pt. Arguello has been requested from both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. At the request of these agencies, two candidate species have also been added to the list. Those species considered in this assessment are presented in Table 1.

We have identified several potential impact producing agents associated with the proposed project for consideration in this assessment. These include: 1) noise and disturbance; 2) platform discharges; 3) vessel traffic; and 4) potential oil spills. Our review of these agents has determined that no significant impacts are expected to the species considered in this assessment. In other words, it is unlikely that there will be any significant interaction between these species and the proposed activities.

Based on the MMS oil spill risk accident rates for platforms and pipelines, we estimate a mean of one (1.04) large spill (>1,000 bbls) to occur as a result of the proposed action. The number of oil spills greater than or equal to 10,000 barrels estimated to occur is less than one (0.44). Note that the above numbers represent oil spill occurrences from platforms and subsea pipelines and not oil spill contacts or impacts. These oil spill estimates are

Table 1. Threatened, Endangered and Candidate Species which may be Impacted by Development and Production Activities in the Study Area (Supplied by USFW and NMFS)

Common Name	Scientific Name	Status
Brown Pelican	Pelecanus occidentalis californicus	Endangered
American Peregrine Falcon	Falco peregrinus anatum	Endangered
Light-footed Clapper Rail	Rallus longisrostris levipes	Endangered
California Least Tern	Sterna albifrons browni	Endangered
Southern Sea Otter	Enhydra lutris nereis	Threatened
Guadalupe Fur Seal	Arctocephalus townsendi	Candidate
Gray Whale	Eschrichtius robustus	Endangered
Right Whale	Eubalaena glacialis	Endangered
Blue Whale	Balaenoptera musculus	Endangered
Fin Whale	B. physalus	Endangered
Sei whale	B. borealis	Endangered
Humpback whale	Megaptera novaeangliae	Endangered
Sperm Whale	Physeter macrocephalis	Endangered
Green Sea turtle	Chelonia mydas	Endangered
Leatherback Sea Turtle	Dermochelys coriacea	Endangered
Pacific Ridley Sea Turtle	Lepidochelys olivacea	Endangered
Loggerhead Sea Turtle	Caretta caretta	Threatened
Salt Marsh Birds Beak	Cordylanthus maritimus martimus	Endangered
Black-flowered Fig Wart	Scrophularia atrata	Candidate

based solely on the oil spill accident rates and the oil resource volume estimates. Additionally, spill trajectory simulations (conditional probabilities) examined include launch areas of proposed lease offering areas, existing lease areas, and pipeline routes in the area of the proposed project. These launch sites used in our analysis are fully inclusive of the area considered in this assessment. Virtually no land segments or target areas appear at risk from the proposed project upon examination of the spill trajectory simulations (based on Sale 80).

A very important component of the oil spill cleanup and containment plans for the study area will be the presence of a new dedicated oil spill response vessel. This 100 - 120-foot standby vessel will be jointly operated by Texaco and Chevron, and will be located at or near Platform Harvest. The addition of this new vessel to existing oil spill response capabilities will significantly reduce the probability of an oil spill contacting any endangered species or their habitat. This is accomplished by reducing the response time to the site of a major spill in the project area by having this added capability in this immediate vicinity.

A review of the currently available information indicates that no significant impacts are anticipated to protected bird species as a result of this project. This is due to: 1) no project activities (platform placement, drilling, transportation routes, onshore support activities, etc.) planned near any sensitive nesting or feeding areas; 2) potential impacts from noise and disturbance are considered low; 3) oil spill occurrence and contact to sensitive coastal areas (bird nesting and feeding areas) is considered unlikely. In the unlikely event that an oil spill does occur and contacts these sensitive areas, or that an oil spill occurs at sea and requires onshore cleanup efforts to

mobilize in a sensitive area in order to attempt a cleanup to avoid shoreline contact, impacts could be high to brown pelicans, and locally high to the least terns, clapper rails and peregrine falcons considered in this assessment. Extensive oil spill cleanup contingency planning, including knowledge of the relative sensitivity of the coastal areas and habitats, and the various alternative cleanup strategies available, could significantly mitigate these potentially high impacts.

Our analysis of potential impacting agents and biological information on marine mammals has determined that no significant impacts are likely to occur to the species considered in this document. Individual sea otters, due to their affinity for nearshore areas and kelp beds, will probably not occur in areas transited by oil and gas support vessels. Oil and gas support vessels will generally be maneuvering between platforms (over three miles offshore) and south between platforms and the onshore supply base, (south of the acknowledged sea otter range). Although support vessels may encounter individual otters, the likelihood of such an encounter is low.

Sea otters could be significantly impacted by an oil spill if the spill entered the fairly restricted habitat of this species. The MMS oil spill analysis indicates virtually no risk of an oil spill contacting the sea otter range (based on conditional probabilities). Based on this analysis signficant impacts to the southern sea otter are not anticipated.

In all probability, the right fin, sei, blue, humpback, and sperm whale population will be unaffected by the proposed project, as only a small segment of the populations of these species have been reported to occur in the project area. The gray whale migration route is relatively narrow and nearshore as the whales round Pt. Arguello. Noise emanating from eight platforms could

cause modification of the normal migration route. However, since no feeding is thought to occur in the area, it is doubtful that significant gray whale population affects will occur.

Significant impacts to the Guadalupe Fur Seal are not likely to occur as a result of the proposed action, since individual seals are unlikely to be physically affected. Only occasional sightings of single individuals in the area have been made in recent decades. At this time, the species breeds only on Isla de Guadalupe, Mexico.

In the event that a spill occurred, whales and reptiles would be exposed to a spill for short periods and may be able to avoid exposure entirely. Individual threatened and endangered reptiles occurring in the project area may experience conflicts with support vessels, but no significant adverse population impacts are anticipated.

Since neither of the two plant species considered by this assessment are located in or near any of proposed onshore development, and their current habitat is at or above the high tide level, no significant adverse impacts are expected to endangered plant species.

In summary, our analysis indicates that individuals may experience adverse impacts as a result of normal project activities. However, populations of threatened, endangered, or candidate species will not be affected in a manner which would jeopardize the continued existence of the species.

II. Purpose

Section 7 (c) of the Endangered Species Act of 1973, as amended, requires that a Federal agency request from the appropriate authority a list of rare, threatened or endangered species present in an area of a proposed major Federal action. When those species are believed to be present, the Federal agency shall conduct a biological assessment to identify any threatened, endangered, or candidate species likely to be affected by the proposed action.

This biological assessment describes the proposed action to the extent feasible; identifies those threatened, endangered, or candidate species most likely to be affected by the action, identifies significant impact producing agents, and analyzes most likely and potential effects.

This document has been prepared in accordance with Section 7 (c) of the Endangered Species Act, in anticipation of a Biological Opinion from both the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Information provided in the biological opinions will be considered by MMS prior to a final decision regarding approval of the identified Development and Production Plans in the southern Santa Maria Basin.

To completely develop the Point Arguello Field, Chevron is proposing to install two platforms, one on lease OCS-P 0316 and one on lease OCS-P 0450. Texaco is proposing to install one platform on lease OCS-P 0315. Chevron is also proposing a consolidated 200,000 barrel per day capacity oil pipeline and a 160 million standard cubic feet per day capacity gas line from Platform Hermosa to the proposed Gaviota processing facility. These consolidated pipelines and facilities were proposed to minimize environmental impacts both offshore and onshore and to address the State of California's concerns. Due to the capacity of the pipelines to shore and potential future development, the MMS believes an area larger than the Point Arguello Field should be considered for environmental

analysis. Accordingly, the MMS has identified a 25 Federal lease area offshore between Pt. Conception and Pt. Arguello and has included possible locations for an additional five platforms and pipelines within this Area Study. Assumptions related to the placement of these platforms have been provided in this document. Therefore, although the proposed project is for three platforms, associated pipelines and an onshore facility, this Biological Assessment and the requested Biological Opinions will consider the potential for eight platforms and associated pipelines in this area. Any reference to "the proposal" or "the proposed project" in this document is to be equated with the eight platform scenario.

III. Description of the Proposed Action

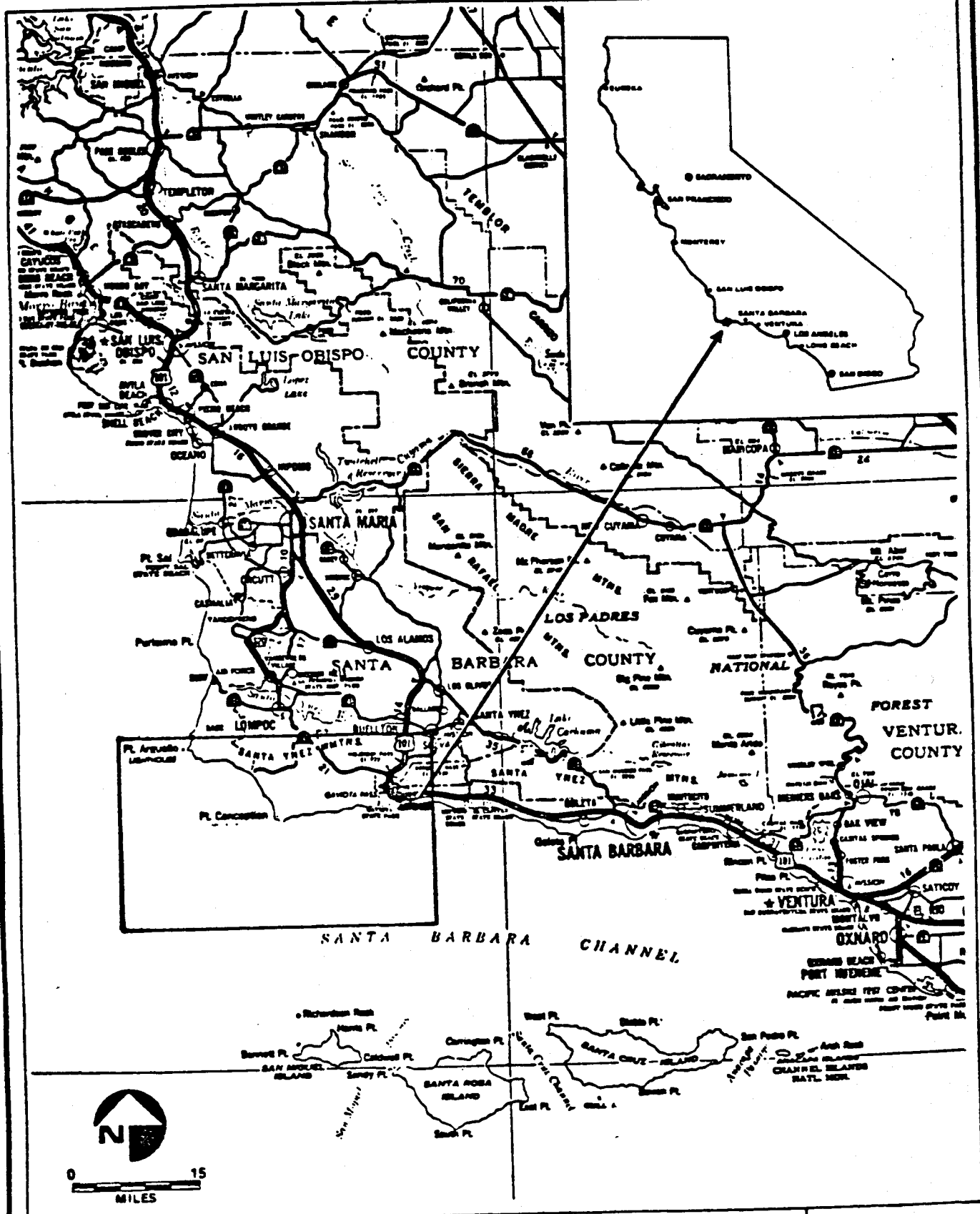
A. General Location

Chevron and Texaco's proposed projects and the Area Study are all found either offshore Point Conception in State and Federal waters or on the Santa Barbara County coastline approximately 30 miles west of Santa Barbara and 1.5 miles east of Gaviota Beach State Park. Figure 1 indicates the general boundaries of the area, although some project impacts could extend well beyond these boundaries. Figure 2 shows the project area and proposed pipeline route in more detail; Figure 3 identifies the boundaries for the Area Study and depicts industry proposed and hypothetical platform locations. Figure 4 indicates the location of the proposed onshore processing facilities. Detailed maps are available for review in the Santa Barbara County Energy Division offices and the offices of the Minerals Management Service, Pacifific OCS Region.

B. Existing Facilities

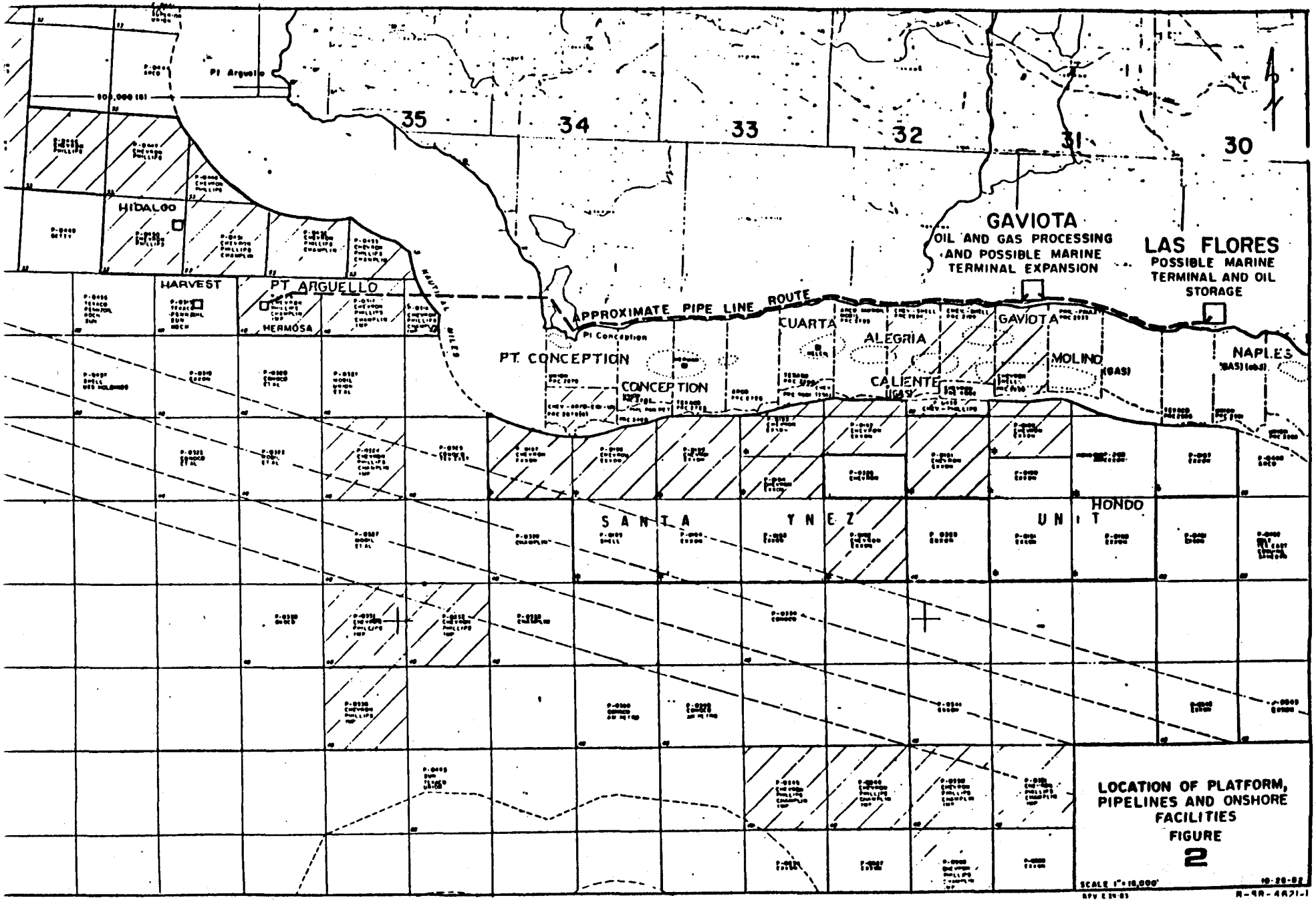
1. Offshore

There are no existing facilities for the offshore component of this project.



Project Site Location as shown on the Road and State Map of California

FIGURE 1


Pt Arguello
35
34
33
32
31
30
HIDALGO
HARVEST
PT ARGUELLO
HERMOSA
APPROXIMATE PIPE LINE ROUTE
Pt Conception
PT CONCEPTION
CONCEPTION
CUARTA
ALEGRIA
CALIENTE (GAS)
GAVIOTA
MOLINO (GAS)
NAPLES (GAS) (abd)
GAVIOTA
OIL AND GAS PROCESSING AND POSSIBLE MARINE TERMINAL EXPANSION
LAS FLORES
POSSIBLE MARINE TERMINAL AND OIL STORAGE
SANTA YNEZ UNIT
HONDO
LOCATION OF PLATFORM, PIPELINES AND ONSHORE FACILITIES
FIGURE
2
SCALE 1" = 10,000'
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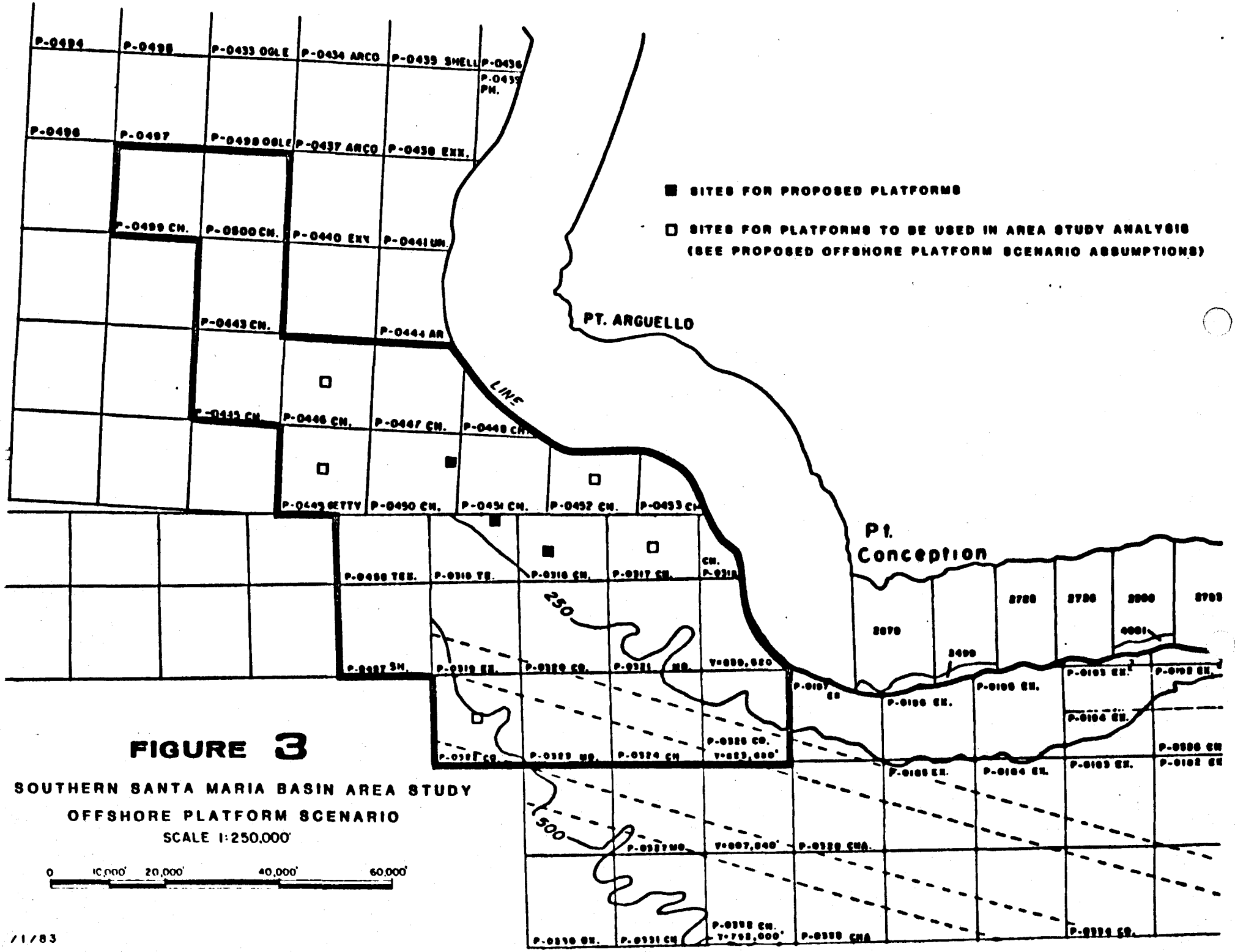


FIGURE 3

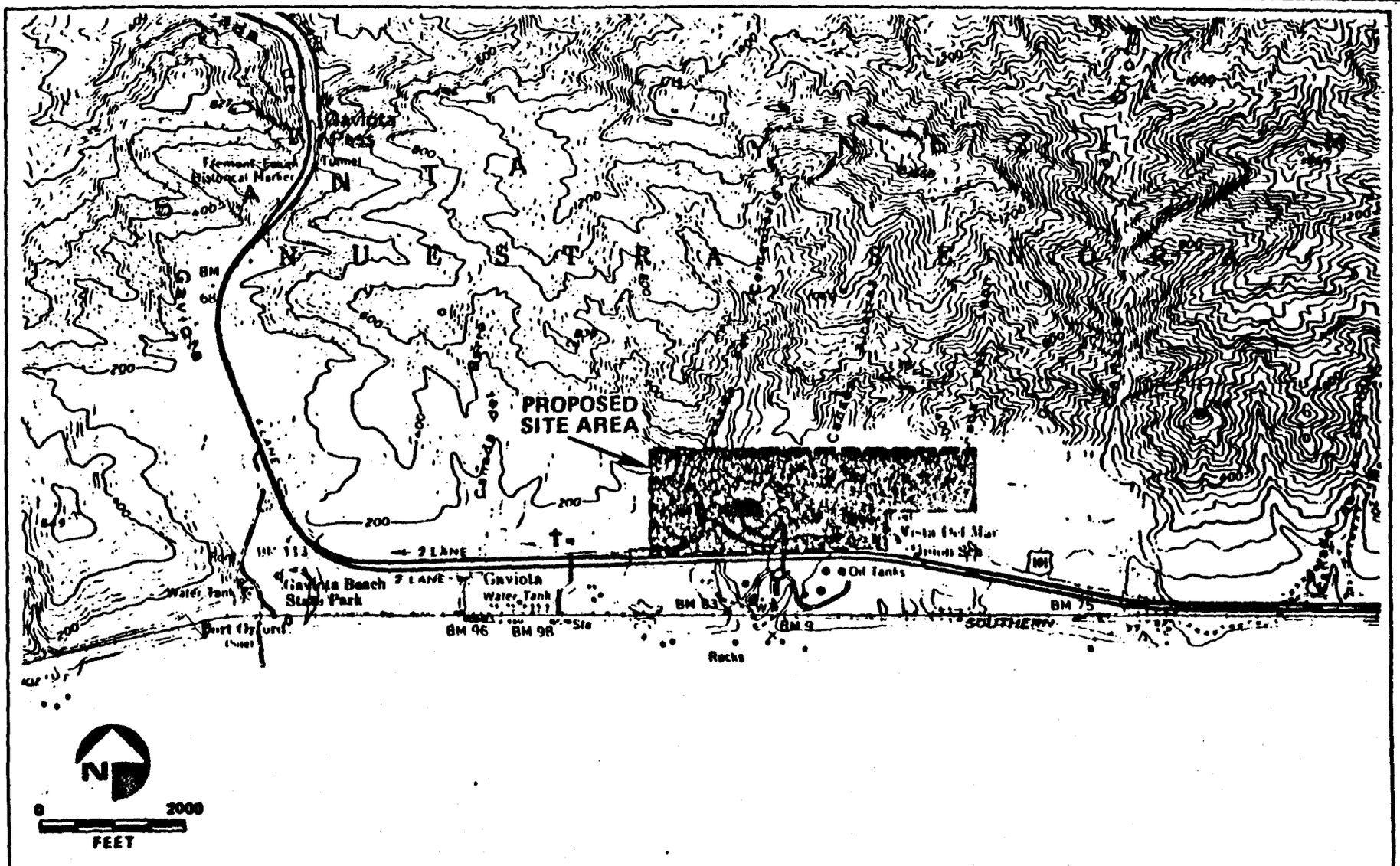
SOUTHERN SANTA MARIA BASIN AREA STUDY

OFFSHORE PLATFORM SCENARIO

SCALE 1:250,000'

0 10,000' 20,000' 40,000' 60,000'

1/83



Chevron U.S.A. Proposed Onshore Facility (USGS 7.5' Quadrangle)

FIGURE 4

2. Onshore

The single existing onshore facility relating to this project is Chevron's gas processing plant located at Gaviota. This plant has been operated since 1962 to process Chevron's natural gas from two nearby State leases. The Low Temperature Separation section of the plant has a capacity of 30 MMSCFD. Existing production at the plant is 0.1 MMSCFD. Gas is compressed and enters the Southern California Gas Company's sales gas line at the project site. This gas line will be used to transport all sales gas produced as a result of the proposed project.

C. Southern Santa Maria Basin Area Study

1. Purpose

The Area Study will consider potential development on 25 OCS leases offshore Point Arguello and Point Conception as indicated in Figure 3. Reasons for considering development from this large area in an area study are given as follows:

Chevron's proposal for Platform Hermosa and development of the Point Arguello Field is the first Plan of Development (POD) received by the MMS in this so called "frontier area" which has been the location of several major hydrocarbon discoveries.

The field is also the most active exploration area off the Pacific coast. MMS estimates the reserves in the Southern Santa Maria Basin to be 400 million barrels of oil for the 25 lease portion. As noted earlier, Chevron has proposed major facilities with

capacities far in excess of the production anticipated from Platforms Hermosa and Hidalgo. All these factors portend substantial development of the area in the years to come.

Because of this potential development, the MMS, Santa Barbara County and the other agencies on the Joint Review Panel are preparing a comprehensive general impact analysis for the Southern Santa Maria Basin considering all reasonable foreseeable development in this area of the Basin over the next ten years. Examination of the potential development of the Basin at this time in a joint EIS/EIR will accomplish several goals:

First, it will provide for the comprehensive evaluation of impacts related to development in the area. This approach is preferable to a individual analysis of impacts and is consistent with the intent of NEPA and CEQA.

Second, an area-wide EIR/EIS on this project will facilitate coordination among all involved permitting and planning agencies. The most significant impact to the State occurs at this stage since all major onshore pipelines and facilities are installed with the first platform. Subsequent platforms would be tied to the existing pipelines offshore. A number of additional comparable platforms can be accommodated by the proposed pipelines and facilities without causing major disruption onshore. An areawide EIS/EIR will address the State's concerns and will establish a baseline for evaluating future projects.

Third, projected cumulative impacts are most appropriately addressed at this stage. Public and agency decision makers may be given a realistic perspective of the magnitude of development and production in the study area which can be expected.

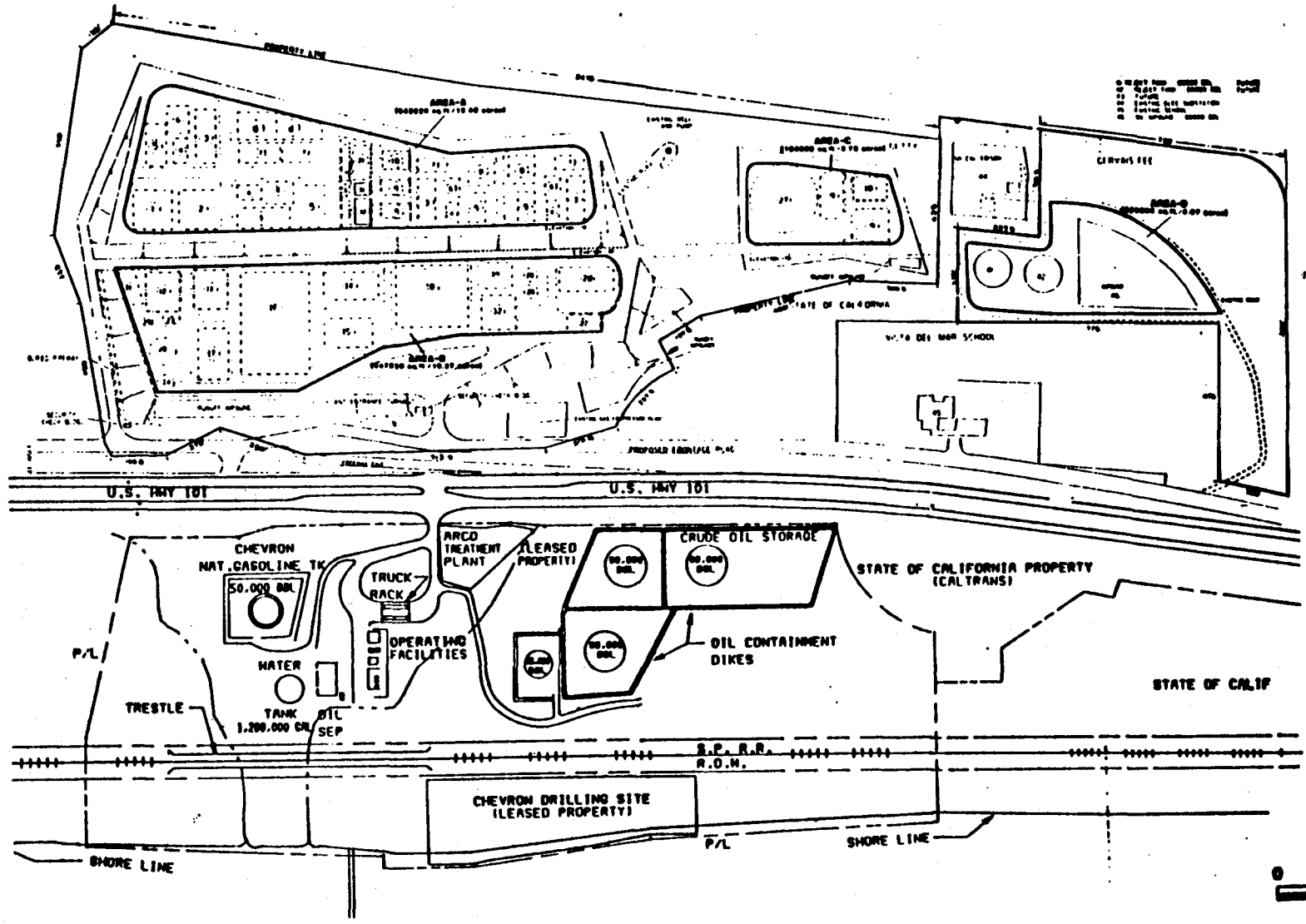
2. Scenario Description

The eight platform scenario is shown in Figure 3. This scenario, the EIR/EIS analysis, and this biological assessment of the scenario will be based on the following factors and assumptions:

a) The maximum number of platforms to be installed in this area, based on our present knowledge and future expectations, is eight.

b) To address potential "worst-case" impacts, installation of these platforms is assumed to occur over the next ten years at the rate of one per year, starting with the installation of Platform Hermosa in 1985. Due to limits of forecasting, the ten-year projection is the maximum period of time that can be reasonably considered. MMS has calculated reserves estimates and production rates for the 25-lease area. A total of 400 million bbls of oil is estimated to be produced by the eight platforms.

c) Though the installations are assumed to occur within the next ten years, the long-term impacts associated with the life of each platform covering approximately 30 years will be addressed in the EIS/EIR and this Biological Assessment.



Plot Plan - Chevron U.S.A. Proposed Onshore Facilities

FIGURE 5

d) Platform placement for purposes of the EIS/EIR and this Biological Assessment is based on industry response, state-of-the-art technology, and MMS's present knowledge of the geology of the area. While preserving confidentiality of the drilling results, MMS assumed placement of platforms in areas where drilling has occurred, where one or more wells have been found "capable of producing in paying quantities" (OCS Order No. 4) by the MMS, and hence, where future development activities are more likely to occur. Except for OCS-P 0315, P 0316, and P 0450 where platform locations are known, platform sites are assumed to be in the centers of the leases for this analysis.

e) Any of the remaining five platforms could be placed on any of the remaining leases in the study.

The number of platforms per lease and general platform descriptions depend on the characteristics of the reservoirs but are expected to remain the same regardless of actual future sitings.

Site specific information not directly applicable to the broad nature of the Area Study is not being gathered at this time but will be considered in subsequent environmental analyses of specific production plans. These analyses will also consider new information not available at the time of the Area Study and any changed conditions which may affect the significance or severity of a project's impacts. General data on all impacts to air quality, marine biota, geology, etc., from the five hypothetical and three proposed platforms will be considered

at this time. Cumulative impacts will again be assessed in each of these reports. By its nature, the Area Study will not include any project alternatives.

D. Project Description

1. Proposed Offshore Platforms, Point Arguello Field

a) Platform Hermosa

Platform Hermosa is a 48-slot drilling and production platform proposed by Chevron on Lease OCS-P 0316 approximately 7.3 miles south of Point Arguello in 602 feet of water (Figure 1). Chevron plans to install this platform in 1985 to commence initial development of the reservoir. Platform Hermosa will be considered the central platform for the Point Arguello Field. Risers will be installed on Hermosa to accommodate pipeline hook-ups from up to three future platforms in the field. Oil production is expected to peak in 1989 at 27,000 barrels per day with 28 million standard cubic feet per day of gas. Initial separation of gas and water from the oil will occur at the platform utilizing three-phase separators. The produced water will be treated to meet current EPA NPDES permit requirements and will be subsequently discharged onsite.

Platform Hermosa will be a conventional eight-leg, jacket steel structure supported on the seafloor by pilings driven through the legs of the jacket and welded to the platform. The jacket will support a three-level deck including well conductors. Fabrication and installation of the platform will follow

conventional procedures. Major marine equipment required for installation of the platform will include a derrick barge, the jacket launch barge, cargo barges, tug boats, supply boats and crewboats. State-of-the-art blowout prevention equipment, safety controls and monitoring devices will be installed on the platform as required by MMS.

b) Platform Harvest

As operator of Lease OCS-P 0315, Texaco proposes to install Platform Harvest approximately 11 miles west of Point Conception in 670 feet of water. Platform Harvest will be a conventional eight-leg pile bottom-founded structure with 50 slots. Texaco proposes to initiate installation in mid-1985. Peak daily production rates of 46,000 barrels of oil, 11,000 barrels of water, and 42 million standard cubic feet of gas are anticipated in 1988. Primary separation processes, disposal procedures and construction activities will be similar to Platform Hermosa. Oil and gas production from Harvest would be piped to Platform Hermosa for placement in the consolidated oil and gas lines to shore.

c) Platform Hidalgo

In 1986, Chevron USA, Inc. is proposing to install Platform Hidalgo on Lease OCS-P 0450, in 430 feet of water following installation of Platform Hermosa. Platform Hidalgo's proposed location is six miles southwest of Point Arguello, approximately three and five miles northwest of Platforms Harvest and Hermosa,

respectively. The three-deck conventional platform will contain 56 well slots, 48 of which will initially be used for production. On-deck pipeline tie-ins from up to three possible future platforms will be provided on Hidalgo. Oil production from Hidalgo is expected to peak in 1992 at 20,000 barrels per day. Gas production has been estimated by Chevron to peak in 1994 at 10,000,000 standard cubic feet per day.

Primary separation processes, disposal procedures and construction activities will be similar to Platform Hermosa. Oil and gas production from Hidalgo would be piped to Platform Hermosa for placement in the consolidated oil and gas lines to shore.

Texaco and Chevron anticipate that the above three platforms, Hermosa, Harvest and Hidalgo, will be able to completely develop the Point Arguello Field.

2. Pipelines

a) Sub-sea Platform Connecting Pipelines

Subsea pipelines are proposed to transport oil and gas from Platform Hidalgo to Platform Hermosa. Oil and gas pipelines sized to accommodate peak production have been routed to avoid hard bottom features and potentially unstable geological features. Texaco is proposing to install a 12-inch crude oil line with 46,000 bbl/day capacity and an 8-inch gas line with 36 MMSCFD capacity between Harvest and Hermosa. Chevron is proposing to install a 14-inch to 18-inch line for emulsified oil and a 8-inch to 10-inch gas line measuring 5.4 miles in length between Hidalgo and Hermosa (Figure 2).

b) Consolidated Lines to Gaviota

Produced fluids will be delivered via new subsea pipelines (discussed above) to Chevron's proposed Platform Hermosa where they will be commingled with fluids from other production facilities and transported to shore in common-carrier or shared pipelines. Chevron proposes to install a 20-inch gas line and 24-inch wet oil line to transport the fluids to shore. These lines will be protected from corrosion and will be equipped with leak detectors, block valves and high and low pressure shutdowns. These lines are proposed to come onshore at a landfall north of Point Conception and continue onshore to Chevron's proposed facility at Gaviota. The subsea pipelines will be laid within a one-mile corridor and will be trenched up to the surf zone, at which point both pipelines will be buried to a minimum depth of three feet. Onshore, with the exception of stream crossings, the pipelines would be buried along the entire route. A dry oil pipeline is also proposed to connect the Gaviota processing facility with either the existing small marine terminal at Gaviota operated by the Getty Trading and Transportation Company or with one of the larger marine terminals proposed at Gaviota and Las Flores Canyon. Each of these alternatives will be analyzed in the EIR/EIS. The pipelines will be installed beginning in the second quarter of 1985 with completion scheduled for fall 1985.

Chevron has expressed a preference for pipeline transportation

of its initial production to Los Angeles. However, impacts associated with transportation of processed oil by pipeline or tanker will not be analyzed as a part of the EIS/EIR. Since these impacts will be thoroughly evaluated in ongoing EIS/EIRs for the proposed Getty Marine Terminal, the Los Flores Marine Terminal and the Pipeline Transportation Study, such discussion will be incorporated briefly by reference only in the EIS/EIR for the Point Arguello Field. To avoid duplication, this Biological Assessment will not consider impacts from transportation of the processed oil.

3. Onshore Processing Facility

a) Land Use Description

The proposed project site at Gaviota was originally leased to Chevron by the Tidewater Oil Company, the former operators of the Gaviota Marine Terminal, to accommodate Chevron's natural gas processing plant. The adjacent Gaviota Marine Terminal, the property located directly to the south between the shoreline and U.S. Highway 101, is currently owned by Getty Oil Company. Getty is proposing to expand and modernize the terminal and develop a supply base as part of its consolidated coastal facility.

The ownership and current land use of other adjacent parcels includes the Sunburst property (owned by the International Reserves Investment, Inc.), located immediately to the west of the project site, which is undeveloped with the exception

of a small cluster of highway commercial uses at the western end of the property. To the east is the Southern California Edison (SCE) Gaviota substation, the Vista del Mar School, an undeveloped portion of Highway 101 right-of-way and the Chevron-owned Gervais Fee property. The Gervais Fee property is zoned agricultural and is currently undeveloped. A portion of this property in the northwest corner (approximately five acres) will be utilized as part of the project for the placement of rerun tanks. The majority of the Gervais Fee property is included in Getty's development plan proposal before the County of Santa Barbara for their consolidated Coastal Facility.

South of Highway 101, on either side of the Getty property, is land owned by the State of California Parks and Recreation Department. The State property adjacent to the shoreline is part of the Gaviota State Beach Park and is used for beach and oceanoriented recreation with overnight camping facilities. The portion of State property bordering Highway 101 is atop the coastal bluff and is not presently utilized for recreational purposes.

The overall topography on the project site is gently sloping near the highway, rising to relatively steep slopes in the canyons and northernmost portion of the property. Average degree of slope is 9.7 percent. Vegetation is composed of disturbed grasslands on the lower slopes and eucaluptus forest along the drainages of Canada del Cementerio and Canada Alcatraz.

The majority of the project site (Getty-owned portion) is cur-

rently zoned M-CD (Coastal Dependent Industry) with a corresponding land use designated in the Santa Barbara County Local Coastal Plan (LCP). Existing structures onsite include Chevron's gas processing plant and a Southern California Gas Company compression and metering station located immediately south of the gas plant. A single lane, all weather access road serves these facilities, emanating off of Highway 101. Other structures on the property include a General Telephone switching station, water storage tanks, and a water well pumping and meteorology monitoring station with a solar power unit.
Gas pipelines to the existing gas facility from Chevron's offshore State leases are buried and follow a right-of-way corridor north through the central portion of the Getty marine terminal site, then travel beneath U.S. Highway 101 to the gas plant.

b) Onshore Processing Facility

The Processing Facility is proposed to handle all oil and gas production anticipated from the Point Arguello Field. Chevron has proposed oil dehydration, gas treatment, oil pumping, gas compression and wastewater treatment for the Gaviota site.
Oil will be dehydrated and processed to remove water and suspended solids. The water removed from the oil--"process water"-- is then sent to the wastewater treatment facility proposed as part of the project, and is treated and discharged into the Santa Barbara Channel through the proposed ocean outfall.
Gas will be sweetened and separated into Liquid Petroleum Gases (LPG), Natural Gas Liquids (NGL), and Sales Gas. LPG

and NGL will be sold and delivered by pressurized tank trucks. A plot plan of the proposed facilities is included in Figure 5.

Phase I construction at the Gaviota site is proposed for eight months beginning in April, 1985 with the facility coming on line in January, 1986. Following installation of Phase I the plant will have a capacity of 150,000 bpd of oil and 60 MMSCFD of gas. Phase II will be installed according to demand from offshore development. Current plans call for the plant to reach full capacity by 1988. This includes a "standby" ability to process up to 250,000 bpd of oil, although normal production is not expected to exceed 200,000 bpd. Chevron has indicated that additional expansion is possible if needed.

The operational life of the project depends on the economically productive life of the oil and gas fields. It is possible that onshore facilities could be maintained and used to process other regional sources of oil and gas after the Point Arguello field has been depleted.

c) Ocean Outfall Line

The outfall line will extend southward from the Chevron water treatment facility through the Getty marine terminal site and run parallel to an existing pipeline alignment directly offshore. The line will be 12-inches in diameter and will extend 3500 feet offshore. The actual point of discharge will be on the seafloor at a depth of 70 feet or 300 feet beyond the historical kelp bed, whichever is greater. Thermal effluents

will not exceed EPA standards. At peak oil production approximately 2.1 million gallons of produced water per day will be discharged. The discharge will be designed to achieve a dilution ratio of 125:1. The outfall line will be constructed as part of the processing facility.

E. Project Alternatives

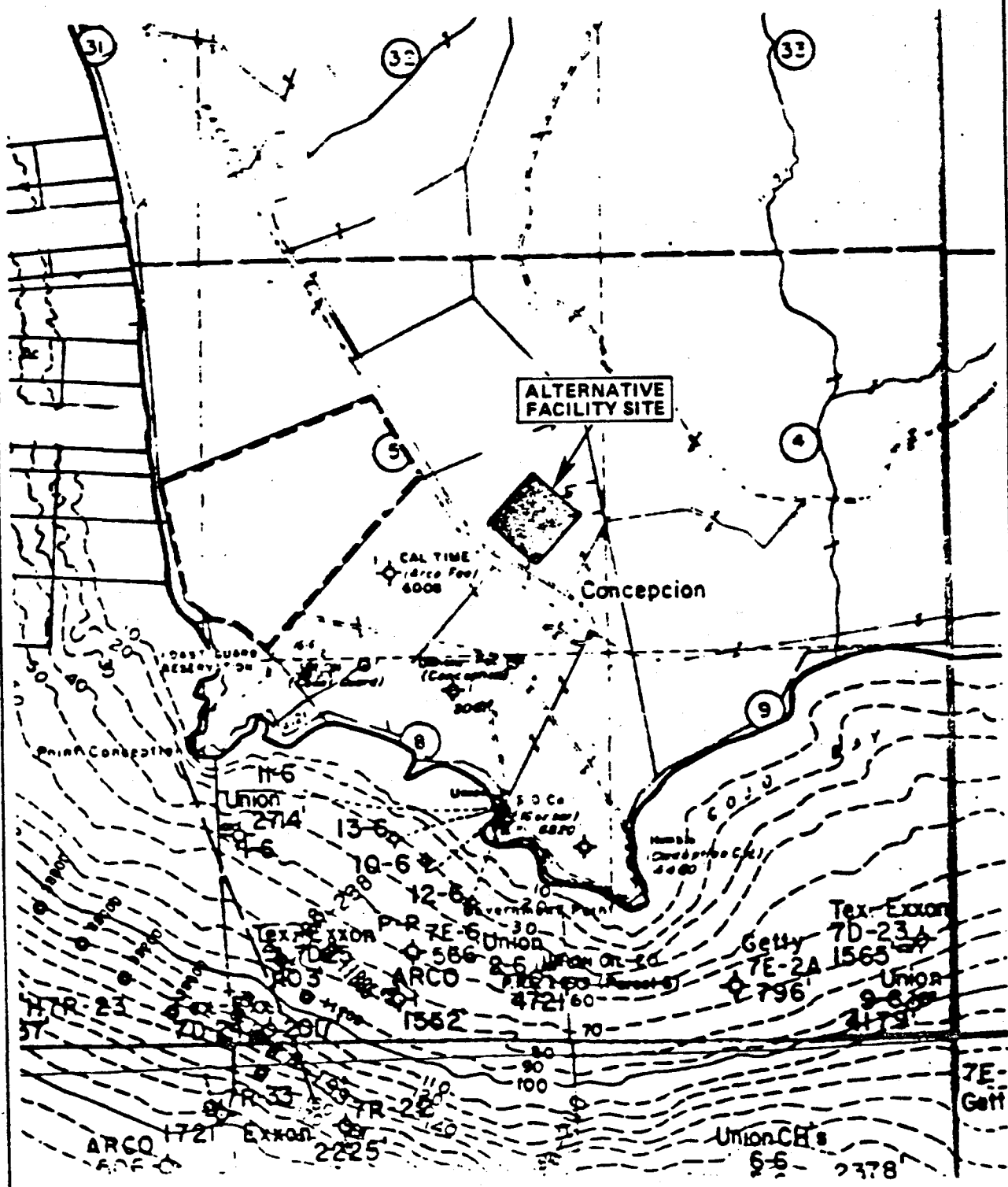
In addition to the "No Project" alternative the EIR/EIS will consider:

1. Proposed Project.
2. Onshore oil and gas processing facility on Chevron's property at Pt. Conception instead of Gaviota, as illustrated in Figure 6.
3. Expanded Gaviota processing facility capacity, to include forecasted production from western Santa Barbara Channel, State tidelands, other southern Santa Maria Basin fields. This alternative will also consider the concurrent phase-out of existing small processing facilities along the coast from Pt. Conception to Ellwood.
4. Transport of natural gas liquids, propane, and butane by pipeline and/or rail instead of by truck.
5. Use of offshore wet oil and sour gas pipelines from Platform Hermosa to Gaviota instead of proposed onshore route.

Transportation alternatives such as pipeline, tanker and rail will be considered in the County's Oil Transportation Plan and a subsequent, Chevron-specific, transportation analysis.

Mitigation Measures - For project components only

There are several major mitigation measures which could be considered as project alternatives but which, by their nature, are better considered



Alternative Processing Facility Site - Point Conception

EXHIBIT 6

as mitigators. These include, but are not limited to, the following:

- Adjustments of platform locations.
- Reinjection rather than discharge of produced waters.
- Pipeline landfalls.
- Construction/operation/termination conditions.

IV. Description of the Affected Environment

A detailed description of the environmental characteristics of the Santa Maria Basin is provided in the Final Environmental Impact Statements for Lease Sale Numbers 53 and 73 (BLM 1980; and MMS 1983a). Specific information describing the environment of the Point Arguello area in the southern Santa Maria Basin has been compiled in Chevron's Environmental Report submitted to the MMS with their Development and Production Plan for the Point Arguello Field (Chevron 1983); Texaco's Environmental Report submitted to the MMS with the Development and Production Plan for Platform Harvest; and the Environmental Reports submitted by each operator for exploratory activities with their Plan of Exploration (Chevron 1980; Texaco 1981). Additional information is available from the numerous references cited in the above-mentioned documents.

V. DESCRIPTION OF RARE THREATENED, OR ENDANGERED SPECIES

The following threatened and/or endangered species may occur in or near the project area and have been requested by the U. S. Fish and Wildlife Service and the National Marine Fisheries Service for consideration in this biological assessment. In addition, two candidate species known to occur in or near the project area have been requested for consideration; the Guadalupe fur seal and the Black-flowered fig wart. The following life history and population distribution discussions have been extracted from OCS Lease Sale Biological Opinions, provided to the MMS by the U. S. Fish and Wildlife Service and National Marine Fisheries Service. Additional information has also been obtained from recognized experts as indicated.

A. Birds

1. American Peregrine Falcon (Falco peregrinus anatum)

The American peregrine was listed as endangered on June 2 and October 13, 1970, and a portion of the peregrine's critical habitat was designated in the August 11, 1977 Federal Register. This subspecies once occurred widely throughout much of North America from southern Alaska and Canada to northern Mexico. The peregrine is migratory throughout its breeding range but movement is less distinct in the southern portion of its range. During the winter, peregrines are common in coastal wetlands throughout the southern California Bight. In California, the species once was widely distributed, with significant populations occurring in the Channel Islands and along the central California coast.

The principal cause of the peregrine population decline was contamination by chlorinated hydrocarbons. Other factors contributing to the decline include shooting, predation, egg collection, theft of young by falconers, human disturbance at nesting sites, collisions with power lines, and loss of habitat due to human encroachment. There were about 50 known nesting pairs of peregrine falcons in California in 1983, mainly in central and northern California.

Several historic eyries are located along the coast from Point Conception south to the Mexican border. At present, however, there are no known active sites south of the eyrie at Morro Bay. Considerable effort is currently being expended toward recovery of this species, chiefly through captive propagation and reintroduction. The Channel Islands include several sites where reintroduction efforts may eventually be made. Natural expansion of American peregrines is anticipated with the decreased usage of residual pesticides.

2. California Least Tern (Sterna antillarium browni)

The California least tern was listed as endangered in the Federal Register on October 13, 1980. The reduction in numbers of least terns has resulted mainly from the loss of feeding and nesting habitats and disruption of remaining nest sites by human-associated activities.

The least tern migrates from Mexico each spring to establish breeding colonies on the California coast. From April to September, it occupies coastal habitats between the Pacific coast of Baja California and the San Francisco Bay. The least tern usually chooses a nesting location in an open expanse of sand, dirt, or dried mud close to a lagoon or estuary where food can be obtained. Prey consists of small fish such as the northern anchovy, deepbody anchovy, jacksmelt, topsmelt, California grunion, shiner surfperch, California killifish, and mosquitofish. Recent studies show that terns from certain colonies regularly fish in waters 2-3 miles offshore. The reduction in numbers of least terns has resulted from the loss of feeding and nesting habitats and disruption of nest sites by human-associated activities.

The areas identified in the California Least Tern Recovery Plan as essential habitat for least terns are: Mission Bay, Sweetwater Marsh Complex, Tijuana River Estuary, South San Diego Bay, North San Diego Bay, Los Penasquitos Lagoon, San Diequito Lagoon, San Elijo Lagoon, Batiquitos Lagoon, Aqua Hedionda Lagoon, Buena Vista Lagoon, Santa Margarita River, Santa Ana River, Anaheim Bay/Huntington Harbor, San Gabriel River/Alamitos Bay, Harbor Lake, Terminal Island, Playa del Rey, Mugu Lagoon, and Ormond Beach.

3. Light-Footed Clapper Rail (Rallus longirostris levipes)

The lightfooted clapper rail was listed as endangered in the Federal Register on October 13, 1970. Critical habitat has not

yet been designated for this subspecies. The current and historic range of light-footed clapper rail extends from Santa Barbara County to Bahia de San Quintin, Baja California, and Mexico.

While the distribution and abundance of Mexican populations still approximate historic levels, California populations have been largely extirpated. Of the approximate 26,000 acres of historic coastal wetlands, only about 8,500 acres currently remain (Speth 1971), and of this, only a fraction provides suitable habitat for the light-footed clapper rail. Particularly devastated are several areas known to have supported very large rail populations. Of the thirty-six coastal wetlands currently extant within its range in California, most or all of which historically supported light-footed clapper rail populations, only about sixteen are currently inhabited by rails. Of these, ten marshes support only five light-footed clapper rail pairs or less. Of the approximate 200 breeding pairs in California, over 90 percent are concentrated in only five marshes (Zembal and Massey 1981). The Baja California population is estimated at 800 pairs: 300 pairs at El Estero, Ensenada, and 500 pairs at Bahia de San Quintin (draft Light-Footed Clapper Rail Recovery Plan).

Recent surveys have documented what appear to be regular movements of rails amongst the many small marshes in southern California. An individual rail banded at Newport Bay was recently seen at

Anaheim Bay, about 12 miles distant, and single pairs of rails have been found at two inland locations where they have never been sighted previously (USFWS file data). These surveys have also documented natural repopulation of several other coastal wetlands from which light-footed clapper rail apparently had been previously extirpated (USFWS file data).

These observations of natural population dispersal provide hope for the possible future recovery of light-footed clapper rail provided that marsh habitat is protected or enhanced in the interim. Such dispersal would appear to ameliorate, to some extent, the potentially disastrous phenomenon of another aspect of rail natural history--that of periodic population crashes in individual marshes and perhaps throughout its range. Obviously, population crashes in small marshes with small light-footed clapper rail populations renders the rail vulnerable to periodic local extinction. Consequently, for this and other reasons, the draft Recovery Plan specifically points out the importance of preserving and managing light-footed clapper rail populations in Baja California.

4. Brown Pelican (Pelecanus occidentalis)

The California brown pelican was originally listed as endangered on October 13, 1970 (35 FR 8320). To date, no critical habitat has been designated for this species. The only regular breeding colonies of this species on the U.S. Pacific coast are located on Anacapa Island and nearby Scorpion Rock. Between 4,000 and 5,000

pelicans reside year around on the Channel Islands, with over 1,600 pairs breeding on West Anacapa Island. During the 1980 breeding season, pelicans nested and successfully fledged young at Santa Barbara Island for the first time since 1967. The breeding population is augmented from late July through early November by large numbers of pelicans (50,000-70,000) which regularly disperse north from Mexican waters. These migrants generally leave the area in November. However, it has been recently determined that some pelicans from Mexico are recruited into the Anacapa breeding population (Gress, personal communication). Pelicans are rarely found far from salt water or farther than 20-30 miles offshore. Their major food is small fishes, with up to 93% of their diet being northern anchovy (Engraulis mordax) which the pelicans capture near the surface by plunge-diving from the air.

During the late 1960's and early 1970's, the Anacapa and Los Coronados colonies suffered catastrophic nesting failure due to accumulations of DDT and its derivatives in reproducing adults. Since about 1974, levels of DDT have decreased in the ocean ecosystem, and food availability now appears to be the major determinant of the pelican's reproductive success. Recent studies have demonstrated the direct relation between pelican productivity and northern anchoy availability and/or abundance. Although oil spills have loomed as a threat to the pelican's survival for many years, significant effects have yet to materialize.

In southern California, anchovy populations vary almost unpredictably from year to year. Recent data from the Anchovy Plan Development Team (Southwest Fisheries Center 1983; Gress and Anderson 1982) have noted a highly significant relationship between pelican productivity (measured as fledglings per pair) and anchovy spawning biomass. The precision of this relationship points to the dependence of pelicans on the anchovy population. The Draft Brown Pelican Recovery Plan (Gress and Anderson, 1982) addresses the need for anchovy management as an integral part of Brown Pelican Management.

B. Mammals

1. Southern Sea Otter (Enhydra lutris nereis)

The population of sea otters in California was listed in the Federal Register as threatened on January 14, 1977 (42 FR 2969). This determination stated that, "A major spill of oil in the waters in the vicinity of the range of the southern sea otter is probably the most serious potential threat to the species. There seems little question that oil would be harmful to these animals, and, indeed, they are more susceptible to this problem than most species." Critical habitat has not been designated.

The Southern Sea Otter Recovery Plan approved by the Director of the Fish and Wildlife Service on February 3, 1982, identifies the establishment of one or more colonies of southern sea otters as the most practical way to minimize the vulnerability of this population to oil spills. The Service is presently reviewing

three areas along the west coast from which a translocation site or sites will be selected. These three areas are: San Nicolas Island, northern California, and southern Oregon.

Presently, there are only a few individual sea otters found nearshore of the project area, around Point Conception. The U.S.F.W.S. has determined that these few individulas are not considered integral members of the population nor pioneering individuals scouting out new habitat into which the population could expand (Biological Opinion for OCS Lease Offering Southern California, April 1984 [Sale 80]).

The historic range of sea otters extended from Morro Hermoso, Baja California, northward along the coast, becoming continuous with the population in Alaska and westward into Asia. Historic abundance of otters in California was estimated at about 16,000 animals (CDFG 1976). As a result of harvesting sea otters for their pelts (1786 through the early 1900's) the California population of the sea otter was thought to be extinct by the turn of the twentieth century.

The range expansion of the southern sea otter population from its nadir in 1914 to its occupied range in 1979 averaged 1.8 miles per year southward and 1.06 miles per year northward (USFWS 1982). The population presently numbers about 1300-1400 individuals and extends along approximately 200 miles of coast between Soquel Point in Santa Cruz County south to Pismo Beach, San Luis Obispo County. A few wandering individuals have been sighted to the

north and south of these range limits.

At present, there is no evidence that the population is increasing its range. More importantly, the population has not significantly increased in number over the past decade and recent data suggests the possibility of a modest decline. Considering the size of the data set and the uncertainties in technique, the 1982 and 1983 population census cannot be taken as conclusive evidence for a population decline. However, we can no longer operate under the assumption that the sea otter population is increasing.

The largest concentrations of southern sea otters are located at the periphery of the range. These groups (fronts) are predominately composed of both breeding and nonbreeding males. At present, the southern front forages within a 10-mile range extending between Shell Beach south to about the Santa Maria River. The northern front forages in the Santa Cruz region. The size of frontal groups varies seasonally. Peak numbers occur in late winter and early spring. In the south, winter studies have estimated as many as 150 to 200 animals, however, recent aerial counts have totaled only about 60 animals. In the north front, the peaks typically range between 60 to 70 animals (Jameson pers comm). Breeding females, juvenile females, and dependent pups are principally distributed throughout the center of the range. The distribution of otters tends to become more clumped during the winter. Kelp beds die back in the winter and storms further reduce the remaining beds. Consequently, the concentrations of otters rafting in the remaining kelp beds become larger.

Sea otters consume a variety of invertebrate species, totalling about 25-35 percent of their body weight per day (Kenyon 1969, Costa 1978). Sea otters maintain a high metabolic rate which partially compensates for the lack of an insulating layer of subcutaneous fat. Insulation from cold sea water is provided entirely by air trapped in the dense fur. Sea urchins, abalone, rock crabs and pismo clams appear to be selectively preyed upon whenever they are available. As areas are occupied for longer periods by sea otters, the availability of large invertebrates decreases and otter diets shift to smaller species such as turban snails, kelp crabs, mussels, and octopuses. Woodhouse, et al (1977) identified 51 species of prey known to be consumed by the southern sea otter.

Southern sea otters rarely haul out on land. At sea they often rest in groups (rafts) of a few to over 100, but otherwise they are solitary animals. When resting at sea, they often wrap themselves in kelp to remain stationary, although in winter when kelp beds are reduced they may raft some distance offshore without the benefit of kelp while waiting out a storm (Woodhouse et al. 1977), but usually they seek the protection of sheltered coves. Sea otters are nonmigratory, although seasonal movements of individuals within the constant range do occur. Juveniles seem to wander more than adults (Estes 1980).

Although breeding and pupping may occur throughout the year, breeding activity apparently peaks in October through December

(Vandevere 1970) and pupping occurs from December through February (Sandegren et al. 1973). Gestation in wild populations is estimated to last from as little as 7.5 months to 13 months (Vandevere 1970). Southern sea otters have been observed to pup in each of at least two consecutive years (Vandevere 1978 and 1979), although northern sea otters bear a pup on the average of once every two years (Kenyon 1969). The dependency period of pups on females is from six to eight months (Vandevere 1979).

2. Guadalupe Fur Seal (Arctocephalus townseudi)

The Guadalupe fur seal is the only pinniped in the project area being considered for listing as a threatened or endangered species by the USFWS. It is the only representative of the genus Arctocephalus (the southern fur seals north of the equator), and is physically distinguished from the more abundant northern fur seal (Callorhirius urseius) by its dense gray-brown coat, coarse guard hair (which may appear grizzled and bleached on the heads and shoulders of adult males), large squarish hind flippers, and long, sharply-pointed muzzle.

Prior to human exploitation, the Guadalupe fur seal existed in great numbers along the California and Mexican coasts, possibly as far north as the Farallon Islands (CCMS, 1982). In fact, evidence gathered from Indian middens suggests that the Guadalupe fur seal may once have bred in the Channel Islands area. By the end of the nineteenth century, however,

the Guadalupe fur seal was on the verge of extinction as a result of intensive exploitation for its fur (Scammon 1874; Hubbs 1956). With the exception of occasional sitings during the early 1900's, the Guadalupe fur seal did not resurface until 1954 when a small population of fur seals were discovered on the east shore of Isle de Guadalupe.

Guadalupe fur seals are still only known to breed on Isla de Guadalupe, Mexico and their total world population has been estimated at less than 2,000 animals (Bonnell et al, 1982). Occasional sitings of individual fur seals have been made recently in the Southern California Bight. During a three-year study funded by the BLM, four males were observed: one at Adam's Cove on Pt. Bennett, San Miguel Island; one amidst a group of California sea lions at Mail Pt., San Clemente Island; and two at sea, one 40 miles south of Santa Rosa Island on the Santa Rosa-Cortez Ridge, and the other 40 miles southwest of the Cortez Bank.

3. Cetaceans

All of the Cetaceans listed below exhibit similar north-south migratory patterns, utilizing high latitude cold water feeding grounds in summer and low latitude warm water calving and breeding grounds in winter:

Common Name	Scientific Name	Status
gray whale	Eschrichtius robustus	Endangered
right whale	Eubalaena glacialis	Endangered

blue whale	Balaenopterra musculus	Endangered
fin whale	B. physalus	Endangered
sei whale	B. borealis	Endangered
humpback whale	Megaptera novaeangliae	Endangered
sperm whale	Physeter macrocephalis	Endangered

Although the limits of the feeding grounds, breeding and calving grounds, and migratory paths vary from species to species, at least part of the North Pacific population of each species may be found in waters of the Southern California Bight at some point during their annual migratory cycle.

a) Gray Whale

The eastern north Pacific population of gray whales is estimated to be between 15,000 and 17,000 whales (Reilly et al 1980). This population migrates through the project area twice annually. The southern migration to the calving lagoons in Baja California, Mexico, begins in November and peaks in January. Rice and Wolman (1971) describe the progression of the southern migration. Pregnant females lead the migration, parous females and mature males follow, and juvenile whales are last. Occasionally, juvenile whales do not complete the southern leg, but linger in kelp beds along the coast and around the Channel Islands (Wellington and Anderson 1978) until the northward migration begins. The return migration to the feeding grounds in the Bering and Chukchi Seas begins in February and lasts through May. Newly

pregnant females lead this leg of the migration followed by adult males and juveniles. Females with calves stay in the lagoons until their calves are strong enough to join the migration. Thus, they are the last group to migrate north. Rice and Wolman (1971), based on the analysis of stomach contents from 136 whales, concluded that gray whales do not feed during either leg of the migration. Wellington and Anderson (1978) suggest that juvenile whales that linger in the kelp beds may be feeding on mysids that inhabit the kelp canopies. This is probably a behavioral characteristic of juveniles not participating fully in the migration and does not constitute a contradiction to Rice and Wolman's conclusion. The gray whale is the species most likely to experience impacts from OCS activities because the entire population mirgates through the project area. During the migratory season, gray whales are the most abundant large cetacean in the project area.

b) Right Whale

The most depleted stock considered in this assessment is the North Pacific population of the right whale. It is estimated to number between 100 and 200 individuals. The distribution of this species is poorly known. Its summer feeding grounds are located in the Gulf of Alaska, along the Aleutian Islands, and in the Bering Sea. Practically nothing is known about its winter distribution. Other populations of this species

are known to utilize coastal bays as winter calving grounds. No calving grounds have been identified for the North Pacific population. In recent years, right whales have been sighted off Baja California, suggesting that this population, like most baleen whales, probably exhibits a seasonal shift to the south in the winter. On April 17, 1981, a right whale was sighted in the Santa Barbara Channel (Santa Barbara News Press, May 5, 1981). This is the first reported sighting of a right whale in the Southern California Bight since 1956. Although no right whales were sighted during the BLM funded 3-year marine mammal survey of the Southern California Bight, this most recent sighting confirms that right whales occasionally can be found in the region.

c) Blue Whales

The North Pacific population of blue whales numbers approximately 1,700 (DOC 1978). A few of these migrate through the project area from May through July on the way to their summer feeding grounds and again from September to February during their migration to wintering grounds in the warm waters off southern Baja California. Even when migrating, the blue whale probably occurs offshore most of the time. Blue whales may be found in the project area from June through December. Their distribution is known to be as close as 15 nautical miles to the mainland coast in the Santa Barbara Channel, north of Santa Rosa Island, and generally along the Santa Rosa-Cortez Ridge to Tanner and Cortez Banks.

d) Fin Whales

The North Pacific population of fin whales numbers about 17,000 and is widely distributed (DOC 1978). The migratory pattern of this population is least well defined of all the large whales. Fin whales may be found in the project area from August through November. No sightings were reported in the Santa Maria Basin 1982 survey. This is probably indicative of the more oceanic nature of fin whales (CCMS 1980).

e) Sei Whales

Sei whales are estimated to number about 9,000 in the North Pacific (DOC 1978). They have been sighted in the Southern California Bight. They appear to be a more offshore species associated with the deep waters of the continental slope. The only sightings made during the three-year BLM survey occurred in September 1975 when two groups totaling five whales were seen west of Tanner-Cortez Banks (CCMS 1980). Apparently, there is a southerly and offshore shift in their distribution during winter. CCMS (1982) reported sightings in the Santa Maria Basin in 1981, but did not see sei whales off the central and northern California coast in 1981.

f) Humpback Whale

The humpback whale is one of the most depleted whale species. The North Pacific population probably does not exceed 1,200 whales (Rice and Wolman 1982). A portion of the population

migrates from its summer grounds in Alaska, south to its calving and breeding grounds off the west coast of Baja California where it spends the winter months. Their summer and winter ranges appear to overlap in the Southern California Bight, and humpbacks may be found in the project area during portions of all seasons. Their peak abundance occurs in summer and fall (CCMS 1981, 1982). Humpbacks have been observed feeding opportunistically on small schooling fish off the coast of California. The importance of the Santa Maria Basin area as a feeding area for humpback whales is unknown.

g) Sperm Whale

The sperm whale is the most abundant large whale in the North Pacific Ocean. Its population is about 300,000 and is widely distributed (DOC 1978). This pelagic species usually is not associated with nearshore waters. The migration path of the sperm whale generally passes seaward of the Southern California Bight; sightings of this species in the project area have occurred near the 1,000 fm isobath. Sperm whales have been sighted in each month of the year, except July (CCMS 1980, 1981, 1982).

C. Reptiles

The four species of threatened and endangered sea turtles listed below are generally distributed south of the Santa Maria Basin area:

Common Name	Scientific Name	Status
green sea turtle	Chelonia mydas	Endangered
leatherback sea turtle	Dermochelys coriacea	Endangered
Pacific ridley sea turtle	Lepidochelys olivacea	Endangered
loggerhead sea turtle	Caretta caretta	Threatened

Records of stranded green and leatherback sea turtles as far north as British Columbia, Canada, and Pacific ridley sea turtles as far north as Humboldt County, California (Stebbins 1966) indicate that occasional transients may wander through the project area. Sightings of leatherback sea turtles in the project area have been reported by CCMS (1981, 1982) as part of the central and northern California marine mammal survey. Stebbins (1966) lists southern California as the northern limit of the range of loggerhead sea turtles.

D. Plants

Two plant species have been requested for consideration in this assessment, the Salt Marsh Birds Beak (Scrophularia maritimus ssp. maritimus) and the Black-Flowered Fig Wart (Scrophularia atrata). The Salt Marsh Bird's Beak was listed in the Federal Register as Endangered on September 28, 1978. Critical Habitat has not yet been determined.

The Black-Flowered Fig Wart currently is not listed as a threatened or endangered species, but has been proposed for listing, giving it a candidate status. It is considered in this assessment at the request of the USFWS.

1. Salt Marsh Bird's Beak (Cordylanthus maritimus ssp. maritimus)
Salt marsh bird's beak is an annual herb (15-30 cm high) with purple flowers, that inhabits the upper elevations of tidal salt marshes. Populations of bird's beak are associated with pickleweed (Salicornia) and salt grass (Distichlis) near elevations at and above high tide.

Historically, this subspecies occurred from Carpinteria in Santa Barbara County south to San Diego County and Northern Baja California, Mexico. Today, distribution is restricted to the Sandyland Marsh (Carpinteria) in Santa Barbara County, Point Mugu in Ventura County, and the Tijuana River Estuary in San Diego County. Destruction of coastal salt marshes is the major factor responsible for the elimination of this wetland species.

2. Black Flowered Fig Wart (Scrophularia atrata)
The black flowered fig wart is a coarse perennial herb with a blackish corolla and constricted orifice, commonly found in dry rocky places, usually well above the high-tide area. This endemic is usually noticed on diatomaceous and calcareous hills well to the north of the project area (near Lompoc), although they have been documented scattered in coastal sage shrub and other plant communities from Point Conception to sandy Burton Mesa, Bishop Pine forests around Lompoc, north to Carralillos Canyon near Pt. Sal, and Avila area in San Luis Obispo County; and south to Coal Oil Point. In a recent study performed for the USFWS, the black flowered fig wart was described at several locations throughout

Vandenberg Air Force Base (Dale Smith, pers. comm. 17 January 1984). This survey observed an important systematic problem involving the black flowered fig wart (Scorphularia atrata) and another species, Scorphularia californica. "... the majority of the colonies of Scrophularia examined on Vandenberg Air Force Base show evidence of hybridzation." In a report to the USFWS (USFWS File Data) Dr. Smith summarized the greatest threat to the species as one of systematics, not conservation.

> "Hybridization with S. californica appears the major threat here. The culprit may be the honeybee, Apis mellifera. It may be postulated that these Scrophularias were previously separated by floral isolating mechanisms operated successfully by different pollinator species. With the advent of the honeybee, which visits and pollinates the two species indiscriminately, extensive hybridization has resulted, creating a mongrelized population in which the original phenotypes are distinguishable only in their most extreme expressions."

VI. POTENTIALLY SIGNIFICANT IMPACT PRODUCING AGENTS

The primary impact producing activities associated with the proposed project include facility installation, drilling and production operations, and facility abandonment. Impacts associated with the transportation of processed oil from the Gaviota facility either by onshore pipeline or tanker will not be analyzed as a part of the EIR/EIS or this Biological Assessment. Since these impacts will be thoroughly evaluated in ongoing EIS/EIRs for the proposed Getty Marine Terminal, proposed Las Flores Marine Terminal and in the Santa Barbara County Pipeline Transportation Study, such discussion will be included briefly by reference only in the Pt. Arguello Field EIR/EIS and this Biological Assessment.

Specifically, the activities which will be evaluated in the EIR/EIS and this Biological Assessment are: installation, operation and abandonment of eight oil and gas platforms, installation and operation of connecting subsea oil and gas pipelines, installation and operation of the 200,000 barrel per day and 160 MCF gas and oil pipeline from Platform Hermosa to Gaviota, and installation and operation of the proposed Gaviota onshore processing facility.

The major impact-producing agents expected from these proposed activities are noise and disturbance, platform discharges, increased vessel traffic and potential oil spills. The following paragraphs describe the sources of these impact producing agents and potential types of impacts associated with them.

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The southern Santa Maria Basin is currently subjected to numerous noise producing activities such as the daily transit of an average of

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25 large commercial ships, commerical fishing, recreational boating, military activities, and ongoing exploratory oil and gas operations. Thus, animals utilizing the project area are exposed to a variety of noise producing agents; this project will add an incremental increase to that background. Offshore sources of noise or disturbance associated with the proposed project will include: temporary sources related to seismic operations, pipelaying, platform installation and abandonment; transitory sources from crewboats, supply boats and helicopters; and the more constant sources related to platform drilling and production. Onshore sources will consist of pipelines and facility installation, and operation of the processing facility.

1. Offshore Sources

   a. Temporary Sources

      Seismic

      Prior to submitting a Development and Production Plan (DPP) for a platform, operators are requested to conduct a geohazards survey over the proposed platform site and pipeline routes. These surveys have been completed for proposed Platforms Hermosa, Harvest, and Hidalgo. Therefore, only a minimal amount of geophysical work would result from this Area Study project. This would arise when the additional five platform sites were proposed and surveyed.

      Seismic operations are used to determine the presence of geologic structures under the ocean floor. The seismic source used most often in offshore operations is the air gun. It consists of a chamber that is filled with compressed air which is suddenly

released creating the seismic impulse. Generally, four to twelve air guns are towed behind a boat at a an average depth of 30 feet. Air is pumped into the guns and is then released, resulting in a "pop" at 10 second intervals. Lines are laid in a grid pattern established by MMS requirements. The number of miles of line or time required to complete a survey would depend on the availability of previous data, water depth, and length of pipeline.

Pipeline and Platform Installation

Operators anticipate that an average of one to two weeks is required to install subsea platform connecting pipelines using the conventional pipelay barge/stinger method. In regard to the larger 200,000 BPD oil line and 160 MMSCFD gas lines, Chevron anticipates that about four months will be required to install these lines from proposed Platform Hermosa to shore. These consolidated lines will be trenched and buried through the surf zone. Noise associated with this operation originates from the barge laying the pipe and would be minimal and temporary in duration.

Platform installation from initiation to completion averages six months. Installation activites which generate noise include initial jacket launching and upending (which requires a few hours), pile installation, and installation of the platform modules. Platforms Harvest and Hermosa are proposed to be installed in 1985; the subsequent six platforms are hypothesized

to follow at a rate of one per year.

Platform Abandonment

Platform abandonment is examined in this section because of its similarity to installation in type of activity and duration. In accordance with MMS orders, when the reserves are depleted, platforms are abandoned and removed. This involves carefully cementing and capping each well, cutting each well below the mud line, removing the platform deck and jacket by crane and barge, and cutting the pilings below the mud line to eliminate bottom obstructions. To date, no platforms have been abandoned on the California OCS. Platform life is usually estimated at 25-35 years.

b. Transitory Sources

Service Vessels

Crewboats and supply boats would be used daily to transport personnel and supplies to the platforms. These vessels presently service exploratory and development operations throughout the Santa Maria Basin and Santa Barbara Channel; an incremental increase would be expected to service this additional eight platform development.

Support vessels measure 60-300 feet and are twinscrew, gasoline or diesel powered. Noises emanating from these vessels are well documented (Urick 1975; Ross 1976; Leggat 1981). The primary source of the noise is propellar cavitation, which

occurs at normal and high running speeds, and during maneuvering operations (Gale 1982).

Travel routes have been designated for service vessels by both Chevron and Texaco for the proposed platforms to minimize disturbances to kelp beds and sensitive haul-out or nesting areas. Operators of these vessels are also given the Fisheries Training Program which describes the potential impacts to breeding or nesting areas when disturbed.

Helicopters

Helicopters transport crew to the platform site daily. Offshore California, helicopters are the primary mode of crew transport. Many operators now have IR helicopters which can operate safely in low visibility conditions. Helicopters can be substantial sources of noise. Although an above-water source, and much of the sound energy impinging on the water is reflected, sound can penetrate into the water under the helicopter and be propagated as underwater noise. The characteristics of the noise depend on helicopter type, flight conditions, altitude, water surface roughness, sound-speed profiles, and absorption characteristics of the sea bottom (Gales 1982). Information on underwater noises associated with helicopter hover and flyover are also available in the literature (Urich 1972; Young 1973).

c. Operational Sources

Drilling and Production Activities

Development drilling, assuming two rigs per platform and three months per well, can require three to five years. Production would be expected to come on line within a year after drilling had commenced and continue for the life of the project. Machinery noise sources found on drilling and production platforms are, generally, similar to those used for shore-based operations. Special noise attenuation devices are sometimes used offshore to protect workers in their living quarters located on the platforms. Compressors and diesel engines are usually the loudest equipment on a typical platform, emitting about 90 dBA at a distance of 15 m (50 ft). By comparison, a diesel truck under full load also emits about 90 dBA at 15 m.

A relatively limited body of information is available on the noises generated by offshore platforms. According to Gales (1981), in light airs sub-sea surface noise propagated by a platform may be detected up to 100 miles away.

In a study performed for the BLM (Gales 1982), noises from eighteen platforms were measured. Of these, fourteen platforms were offshore Santa Barbara, California.

Results from this study indicated that oil and gas platforms produce significant underwater noise covering a fairly wide range of frequencies. Moreover, underwater sounds from the platforms measured did not reveal markedly different character-

istics whether they were engaged in drilling or production. The most important observations made were that platform noises were generally steady, and certain platforms may be designed and constructed for reduced sound emission.

Above water, in a quiet sea with light wind conditions, normal offshore platform operations would be inaudible beyond about two miles (assuming ambient background noise level of 40 dBA and attenuation due to sound wave spreading only) (MMS 1983a). In rough seas and and weather conditions, the offshore facility would be inaudible beyond about 1/8 of a mile (assuming 70 dBA background). Therefore, no onshore noise impacts are anticipated from the offshore platforms.

Pipeline Operation

No noise is predicted for pipelines during the operational phase.

2. Noise Sources - Onshore

a. Facility Installation

The most disruptive part of the project onshore will likely occur with the construction and installation of the facilities. As with any onshore construction activity, noise levels will increase substantially during construction over a localized area. Concurrent construction of the oil and gas processing facility and cogeneration power plant will result in short-term noise impacts to the surrounding area. Grading and other construction activities will require use of equipment such as bulldosers, cranes, air compressors, backhoes, scrapers,

loaders, pavers, trucks and welding machines. Use of explosives or explosivetype equipment is not anticipated. Equivalent sound levels (Leg) associated with the construction of the oil and gas treating facilities could reach 98 and 94 dBA at 15 meters (50 feet) respectively. Eqivalent sound levels (Leg) associated with the installation of onshore pipelines would be approximately 88 dBA at a distance of 15 meters (50 feet) from the center of construction activity. The increased noise due to construction of the facility and pipelines will be temporary and shortterm. In particular, noises from onshore pipelaying activities would be of very short duration one-two days) as the pipeline construction moves out of the area.

b. Operations

Operational sources of noise onshore at the gas processing facility include a gas processing unit, gas refrigeration system, sulfur recovery units, Sales gas compressor unit, and tail gas incineration and SO_2 removal. Sources of noise at the oil processing facility include the instrument air compressor, cogeneration plant, pumps, loading facility, and crude heating, dehydration and stabilization. The total sound power level from these sources is estimated at 98 dBA, however, acoustical enclosures, silencers and mufflers should reduce the sound pressure level to below 85 dBA at 0.9 meters (3 feet).

B. Solid and Liquid Disposal

Since solids or liquids disposed of onshore are disposed of in designated dump sites, the discharges which are most likely to effect endangered or threatened species are those which are discharged into the marine environment. This would include platform discharges such as drilling muds, formation waters and sanitary effluents, and discharges through the Gaviota facility ocean outfall.

Drilling Mud

The types of drilling muds used must be approved by EPA Region IX. Quantities and constituents are found in the DPP's for individual platforms. Generally, up to 2,000 barrels of mud are discharged per well. Drilling mud is essential to drilling and maintaining control of an oil and gas well.

Numerous studies have been funded to examine potential impacts of drilling muds. Most recently, the National Academy of Sciences published a study for the MMS entitled "Drilling Discharges in the Marine Environment." This review of existing information on the fates and effects of drilling fluids and cuttings on the OCS showed that "... the effects of individual discharges are quite limited in extent and are confined mainly to the benthic environment."

Other studies conducted at OCS well sites (Ayers, et al, 1980a; 1980b; Ray and Shinn 1975; Ray and Meek 1980; Zingula 1975) indicate that drilling muds undergo rapid dilution within a relatively short distance of the discharge point, an important factor in assessing the significance of discharge impacts to endangered species. Also, acute lethal toxicities of drilling muds to marine organisms are very low (Petrazzulo 1981). Laboratory bioassays conducted to determine

acute toxicities indicate that in most cases LC_{50} values of used drilling muds were greater than 10,000 ppm (Petrazzulo 1981). Thus, rapid dilution and low acute toxicities of drilling muds, combined with the pelagic life style of the endangered aquatic species being considered in this assessment, will in all likelihood minimize direct adverse impacts of platform discharges to those species.

Formation Water

Formation waters are recovered along with oil during petroleum production and reflect the environment of their deposition. Estimated quantities are described in the ER for proposed platforms. Historically, formation waters recovered on the Pacific OCS have been discharged into the marine environment from the platform. Formation waters contain numerous minerals (low levels), including iron, calcium, and magnesium, along with entrained oil, trace elements, and an absence of dissolved oxygen. The impacts of formation waters on the marine environment are expected to be restricted to less than 500 meters from the discharge point (MMS 1983a). Impacts to endangered organisms found within that radius are expected to be insignificant due to the dilution capacity of the water column and the limited exposure period likely to occur for individual endangered organisms.

Sanitary Wastes and Other

Sewage effluent, also discharged into the marine environment at the platform site, must contain 50 ppm or less of suspended solids and a minimum chlorine residual of 1.0 mg/liter in order to conform to EPA discharge requirements. Although sewage discharges add pollutants to

the ocean, the volumes expected (3,600 gallons per platform per day) are insignificant compared to the volume of receiving water. Endangered species are not expected to be significantly impacted, unless they locate immediately under the discharge pipe, which will be 125 feet below the Mean Lower Low Water (MLLW) level.

Cooling water discharges (i.e., thermal) represent a considerable portion of total daily project effluents. Cooling water will be discharged at a depth of 125 feet below MLLW and may be up to 12°C warmer than receiving water. No significant impacts to endangered species populations are anticipated due to the limited exposure period likely to occur to individual organisms, and the lack of impact to critical habitiats.

C. Vessel Traffic

Proposed development of the Southern Santa Maria Basin will result in an increase in marine vessel traffic. The increase associated with this area study results from added crew boat and supply boat activities. As discussed in an earlier section, animals in the project area are exposed to impacts from a variety of vessels: commercial fishing, recreational boating, shipping activities (averaging 25 large ships per day) and military/Coast Guard activities.

Direct impacts to marine organisms could occur if animals were accidently struck by boats. Two steps to minimize this impact have been proposed: (1) designated travel routes will be established which avoid sensitive areas or places where marine animals congregate, and (2) boat operators and offshore company personnel will be given the Fisheries Training Program. This training program not only informs boat operators of

potential commercial fishing conflicts, but also familiarizes personnel with potential impacts resulting from support vessels in nearshore or sensitive areas. Though the potential exists that some of the listed species may encounter harm through a boat accident, this occurrence is unlikely.

D. Oil Spills

A major environmental concern with offshore oil and gas activities is the potential for a large oil spill and the resulting effects on the biota. For the purposes of this assessment, the biota is limited to threatened, endangered, or candidate species status, in the project area.

In the course of normal, day to day platform operations, unplanned, occasional accidental discharges of hydrocarbons may occur. These individual accidents are typically limited to discharges of quantities less than one bbl of crude oil. In the period between 1975 and 1981, a total of only 24 of these accidents have taken place on the entire Pacific OCS area. These spills have resulted in less than 20 bbls of oil being discharged to the ocean. Due to the infrequency and low amounts of these accidental discharges, they are not considered to be a significant impact producing agent for the biota considered in this assessment.

Oil spills may be catastrophic events and results from a well blowout, vessel-vessel collisions, vessel-platform collisions, pipeline breaks, or operational errors.

In general, the level of impacts of a major oil spill will depend on many factors. These factors would include: the relative abundance and sensitivity of marine organisms, (varying temporarily); which phase of the reproductive cycle; the degree of oil weathering and evaporation; the nature of the spill-instantaneous or continuous; the type, rate, and volume of oil spilled; and the weather and oceanographic conditions

at the time of the spill. These parameters would determine the quantity of oil that is dispersed into the water column, the degree of weathering, evaporation, and dispersion of the oil before it contacts a shoreline, the actual amount, concentration, and composition of the oil at the time of shoreline or habitat contact, and a measure of the relative toxicity of the oil. These factors along with knowledge of the affected habitats and organisms will be critical in determining the best clean-up strategies.

For the purposes of impact analysis in this biological assessment, MMS has estimated the number of oil spills that could occur as a result of the proposed action. The estimates are based on a production value of 400 million bbls of oil over the 30-year life of the project, with subsea pipeline transportation of hydrocarbons to shore. Based on the MMS Accident Spill Rates for platforms and pipelines (see MMS, 1983a and b; Lanfear and Amstutz, 1983; and LaBelle, et al., 1983), we estimate a mean of one (1.04) large spill ($\geq$ 1,000 bbls) to occur as a result of the proposed action. The mean number of very large spills ($\geq$ 10,000 bbls) estimated as a result of the proposal is less than one (0.44). Note that these numbers represent oil spill occurrences and not oil spill probabilities, contacts, or impacts, and are based solely on the oil spill accident rates and the oil resource volume estimate.

In order to determine the possible contacts of proposal-generated oil spills, we have analyzed (Table 2) the conditional oil spill probability data generated for the most recent OCS leasing activity:

Proposed OCS Lease Offering for Southern California, April, 1984 (Sale 80) (see LaBelle, et al, 1983). Conditional oil spill probabilities are independent of both the accident spill rates and the resource estimates. The conditional oil spill probabilities are based solely on the spill simulation trajectories and assume a spill has occurred. Furthermore, the launch areas for the spill simulations from the lease sales differ slightly from those of the proposed action. The spill trajectory simulations examined include proposed lease offering areas, existing lease areas, and pipeline routes in the area of this proposed action. These launch sites are fully inclusive of oil spill analyses and modeling will be available and presented in the DEIS/EIR to be prepared for the proposed action and will immediately be made available to FWS and NMFS.

Based on the above analyses of conditional probabilities, it is considered very unlikely that if an oil spill occurs it will contact critical land areas of the Southern sea otter. That is, the probability is less than 0.5 % that an oil spill starting from the project area will contact the sea otter ranges within 30 days (Table 2). For the purposes of this analysis, launch areas E17 and E18 were considered, as well as pipeline segments L6 and L8 (LaBelle et al, 1983; see Figures 3 and 5a).

The risks from spills would be mitigated to the extent that weathering and decay of oil occurs at sea, and by the success of spill countermeasures which would be attempted (see Appendix D for a discussion of these measures). Those measures were not directly included in the above data generated by the oil spill model, but will be considered

TABLE 2.

Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 30 days

Targets	Hypothetical Spill Locations			
	E17	E18	L6	L8
Land	16	33	24	19
N. Channel Islands	33	60	29	45
S. Channel Islands	n	n	n	n
Channel Islands	33	60	29	45
N. Sea Otter Range	n	n	n	n
S. Sea Otter Range	n	n	n	n
Sea Otter Range	n	n	n	n
Santa Monica Bay	n	n	n	n
San Nicolas Island	n	n	n	n
Begg Rock	n	n	n	n
N. Anacapa Island	n	n	n	n
San Miguel Island	27	54	23	37
Least Tern Colonies	n	n	n	n
Least Tern Colony 1	n	n	n	n
Least Tern Colony 2	n	n	n	n
Least Tern Colony 3	n	n	n	n
Least Tern Colony 4	n	n	n	n
N. Offshore Feeding	3	2	3	3
S. Offshore Feeding	5	4	5	6
Anacapa Island	n	n	n	n
Santa Barbara Island	n	n	n	n
Coronados Islands	n	n	n	n
Guadalupe Island	n	n	n	n
Farallon Islands	n	n	n	n
Baja Islands	n	n	n	n
Coastal Feed. Area 1	22	31	41	15
Coastal Feed. Area 2	n	1	n	n
Coastal Feed. Area 3	n	n	n	n
Coastal Feed. Area 4	n	n	n	n
Coastal Feed. Area 5	n	n	n	n
Coastal Feed. Area 6	n	n	n	n
Coastal Feed. Area 7	n	n	n	n

NOTE: n = less than 0.5 percent

(From LaBelle, et al, 1983)

in translating the spill contacts predicted by this study into spill impacts for environmental analysis.

Oil spill cleanup and containment capabilities and requirements are a very important component of the proposed action and they are discussed in Appendix D. These measures are thought to mitigate potential oil spill impacts.

An important component of the oil spill cleanup and containment plan for the area study will be the presence of a dedicated oil spill resource vessel. This 100-120 foot standby vessel will be jointly operated by Texaco and Chevron, and will be located at or near Platform Harvest. The addition of this new vessel to existing oil spill response capabilities should further reduce the probability of an oil spill contacting any endangered species or their habitat.

VII. ESTIMATED MOST LIKELY IMPACTS TO THREATENED AND ENDANGERED SPECIES DUE TO THE PROPOSED ACTION

The previous section (Section VI) presented information on the types of significant impact-producing agents that occur as a result of the proposal. The present section provides discussion of the estimated most likely impacts to threatened and endangered species as a result of proposal-related activities. Discussion of impacts to candidate species is also provided.

Under each resource category (i.e., birds, mammals, reptiles, and plants) there is a discussion of potential impacting agents affecting resources, and the potentially affected species. Further discussion covers reasons why other species are not likely to be affected by those impacting activities. This is followed by a discussion of the most likely impacts that are estimated to result from the proposal. A summary of recent studies on the effects of noise and oil spills on marine mammals are in Appendices A and B respectively. Potential impacts to birds from oil spills are discussed in Appendix C. At the end of each resource section (birds, mammals, reptiles, and plants) overall conclusions are presented.

A. Birds

Four bird species have been identified for consideration in this assessment, the brown pelican (Pelicanus occidentalis californicus), the American Peregrine Falcon (Falco peregrinus anatum), the light-footed clapper rail (Rallus longisrostris levipes), and the California

least tern (Sterna albifrons browni). A review of the potential impact producing agents associated with this project has indicated that none of the proposed activities are expected to significantly impact populations of the endangered birds in consideration. Although it is possible that individual birds may interact on occasion with the project activities, it is unlikely that there will be any significant adverse impacts to these birds. Normal onshore activities are not expected to disturb any endangered birds, since there are no known nesting sites located near the proposed activities.

Nesting areas of the brown pelican are located at Anacapa Island, over 50 miles from the nearest project activity. The closest California least tern nesting area is also located over 50 miles east of the project area at Ormond Beach, Ventura County, and the light-footed clapper rail is known to use the Goleta slough and Carpenteria marsh in the Santa Barbara Channel on occasion for breeding purposes. The main breeding areas for the rail are located well to the south of the project area in San Diego and Orange Counties, and in Baja, California. Based on the distance of the project area from these nesting areas, onshore activities are not considered as potential impact producing agent to the brown pelican, California least tern or light-footed clapper rail.

Although there currently are no known nesting peregrine falcons in or near the project area, individuals of this species are probably the most likely of the birds considered in this assessment to interact with onshore project activities. Currently, the nearest nesting pair of peregrines occurs at Pismo Beach in San Luis Obispo County, several

miles north of the project area. The peregrine falcon recovery plan has identified translocation as a means of encouraging recovery of this species. Since it is possible, although unlikely, that peregrines could be translocated into an area nearby the project area, or peregrines may establish a nest near the project area by themselves, potential impacts to the peregrine from onshore activities proposed by this project are discussed in the species discussion below.

Offshore components of this project are not expected to significantly affect any endangered birds or the availability of prey for these species. While individual birds (especially foraging brown pelicans and least terns) will no doubt be subjected to platform noises, and support vessel traffic, there is no evidence to suggest that adverse impacts could occur from these interactions. Likewise, platform discharges are very unlikely to adversely impact any endangered birds.

The remaining potential impact producing agent to endangered birds from the project activities is the occurrence of an oil spill. Of the endangered bird species, brown pelicans are the most likely birds to be oiled as a result of an open-water spill. A spill impacting the shoreline may affect brown pelicans, California least terns, and light-footed clapper rails. Impacts to the peregrine falcon from an oil spill would probably be indirect. For example, if the peregrine consumed prey which had been contaminated with oil. The probability of an oil spill has been discussed in the preceding section. Appendix C provides a general summary of potential impacts to endangered birds contacted by oil.

The most likely potential impacts to endangered birds from all potential impacting agents, including oil spills, is discussed individually in the following pages.

In the unlikely event of an oil spill passing near nesting areas of any of the endangered birds, it is conceivable that oil spill clean-up equipment and personnel could create a disturbance which would adversely affect nesting activities. Several of the species, flush easily from nests, leaving young and eggs open to predation and exposure. However, the distance of known nesting areas from the project area and adequate contingency planning should eliminate this possibility.

1. Noise and Disturbance

American Peregrine Falcon

Although there currently are no peregrine nests anywhere near the proposed onshore facilities, it is conceivable that a nesting pair could locate nearby prior to construction activities. Since normal activities are not expected to cause any disturbances, impacts to peregrines are likely only during the construction phase, estimated to last four months. The critical period during which peregrines would be most sensitive to noise occurs from February 1 to August 1. Nesting generally occurs late March through April, the fledgling period may last through June. Young peregrines are dependent on adults for 1 month after fledgling. Nearby disturbances such as loud noises during this time may cause young to be flushed from the nest early.

Normal construction activities within one mile of a peregrine nest would not necessarily adversely impact the peregrine falcon.

Peregrines are not intolerant of human noise and activity, and have been reported to nest within major cities, on high buildings. Peregrines, however, probably would be sensitive to very loud, sudden noises such as explosives. No explosives are proposed for use in this project. Nesting peregrine falcons could, on occasion, be disturbed by aircraft overflights related to the proposed project if a pair is located nearby. Since there are currently no peregrines nesting south of Pismo Beach, and no use of explosives (or explosive type devices) are anticipated, adverse impacts to the peregrine falcon from the activities proposed by this project are considered unlikely.

2. Oil Spills

a. Peregrine Falcon

Peregrines generally feed by knocking down flying birds and catching them mid-air. Seabirds such as phalaropes are a common food for peregrines. One of the significant consequences of oiling seabirds is their loss of, or reduced ability to fly. Peregrines could be oil fouled by capturing an oiled bird. However, the likelihood of this is considered very low. One pair of peregrines represents about two percent of the total breeding population. Based on the likelihood of an oil spill occuring and contacting birds, impacts to the peregrine are considered very low.

Peregrine nest sites are restricted information to protect the birds. Therefore, should a spill occur, prior to any cleanup efforts which may disturb the nest sites, contact

should be made with the appropriate regional office of California Department of Fish and Game to determine if any nesting sites would be potentially impacted. This type of coordination should avoid or reduce potential impacts to the peregrine resulting from an accidental oil spill.

Least Tern

Potential impacts to the California least tern from the proposed project are considered low. The only potential impacting agent considered applicable for this species is the potential of an oil spill in the project area. Areas of concern within or near the project area which are considered important in the Least Tern Recovery Plan (USFWS 1977) include Oso Flaco Lake, Santa Maria River mouth, San Antonio Creek, Purisima Point, Santa Ynez River mouth, Santa Clara River Mouth, Ormond Beach and Mugu Lagoon. Approximately 1,200 least tern pairs nest in California (John Gustafson, Cal. Fish and Game Field data sheet, 1982). All of the areas near the project area were estimated to have less than 20 nesting pairs. In the event that an oil spill occurred and contacted the California least tern habitat, local impacts could occur.

Least terns nest on sandy beaches, often in estuarine habitats. Juveniles are taught to feed in these quiet waters. Adults often feed at sea. If a large spill occurred during spring or early summer, nesting adults could become oiled while

fishing. Oiled birds could contaminate young or eggs upon returning to the nest. Resulting mortality could be high. If an oil spill approached nearby a least tern colony, the impacts to that colony could be locally high.

However, since the likelihood of an oil spill occurring and contacting a least tern colony is low, and the colonies of least terns nearest the project area are small, the most likely impacts to least tern populations from the project activities are considered insignificant.

California Brown Pelican

The most likely potential impact to individual brown pelicans would arise if an accidental oil spill occurred. Although brown pelicans are known to occur within the project area, the main population and nesting areas are located over 50 miles to the south. It is not believed that those pelicans transiting the project area would include adults foraging from a nest site on Anacapa Island. Gress and Anderson (1982) reported feeding areas are usually within 30 to 50 km of the colony and CCMS (1980) reported spring concentration occurred in the vicinity of the Anacapa nesting colony. The likelihood of an oil spill occuring in the project area and significantly impacting the breeding California brown pelican population on Anacapa Island is therefore considered low. Furthermore, due to the complex currents in the channel, the likelihood of an oil spill reaching the vicinity of Anacapa Island is unlikely. Since individual, non-nesting birds occurring in

in the project area are widely dispersed and may exhibit some avoidance behavior, most likely impacts to the brown pelican are considered low.

Light-Footed Clapper Rail

Since potential impacts to the clapper rail from the proposed project could occur only in the event of an oil spill, the most likely impacts to this endangered bird are insignificant. The light-footed clapper rail primarily uses the upper reaches of estuaries for feeding and breeding. These areas are only seasonally subjected to high tides, therefore, they are usually inaccessible to spills. The nearest reported occurrences of clapper rails to the project area are small colonies at Goleta Slough, Carpinteria Marsh and Mugu Lagoon. If an oil spill did occur, containment equipment should be able to prevent oil from entering these areas and impacting the rails' habitat. However, if an oil spill did contact rails in these areas, the potential impacts could be locally high. Since the likelihood of an oil spill occurring and contacting any sensitive habitats containing clapper rails is minimal, and oil spill containment equipment can be used in some weather to prevent oil from entering these same areas, the most likely oil impacts of this project to the endangered light-footed clapper rail population are considered insignificant.

3. Conclusions - Birds

A review of the currently available information indicates that no significant impacts are anticipated to protected bird species as a result of this project. This is due to: 1) no project activities (platform placement, drilling, transportation routes, onshore support activities, etc.) planned near any sensitive nesting or feeding areas; 2) potential impacts from noise and disturbance are considered low; 3) oil spill occurrence and contact to sensitive coastal areas (birds nesting and feeding areas) is considered unlikely. In the unlikely event that an oil spill does occur and contacts these sensitive areas, or that an oil spill occurs at sea and requires onshore cleanup efforts to mobilize in a sensitive area in order to attempt a cleanup to avoid shoreline contact, impacts could be high to brown pelicans and locally high to the least terns, clapper rails and peregrine falcons considered in this assessment. Extensive oil spill cleanup contingency planning, including knowledge of the relative sensitivity of the coastal areas and habitats and the various alternative cleanup strategies available, could significantly mitigate these potentially high impacts.

B. Mammals

The significant impact-producing agents that could affect threatened, endangered, or candidate mammal species are: noise, vessel traffic and oil spills. No significant impacts to applicable mammals are anticiptated as a result of proposal-related platform discharges due to the limited exposure period likely to occur to individual animals

and the lack of impact to critical habitats. A discussion of most likely impacts on the Southern Sea Otter and cetaceans follows. Potential impacts (i.e., those impacts that could occur as a result of the proposed action, but are considered to be unlikely) are presented in the Appendix section of this assessment.

In all probability, the right, fin, sei, blue, humpback, and sperm whale populations will be unaffected by the proposed project, as large numbers of individuals of these species do not occur in the project area. Sensitive calving or breeding grounds do not occur in or near the project area and are also not expected to be affected.

Significant impacts to the Guadalupe Fur Seal are not likely to occur as a result of the proposed action, since individual seals are unlikely to be physically affected. Only occasional sightings of single individuals have been made in recent decades. At this time, the species breeds only on Isla de Guadalupe, Mexico.

1. Noise and Disturbance Impacts

   The proposed area is currently subjected to various noise producing activities such as the transit of large commercial ships, commercial fishing and on-going exploratory oil and gas operations. Thus, there is a high potential for mammals that utilize the area to be exposed to a variety of noise producing agents. Noise sources specifically associated with the proposed action are: drilling, normal platform activities, crew boats, supply boats, and helicopters.

   Of the listed mammals, only gray whales are thought to be poten-

tially affected by noise-related impacts from the proposed action. Other listed mammals are unlikely to be significantly affected by this impact-producing agent, since available data (Section V) indicate that relatively few of these individuals occur in the project area.

The Southern sea otter is not expected to experience any impacts due to noise resulting from this project. Seismic activity related to the project is expected only in the immediate vicinity of the five additional proposed platforms and associated pipelines, well to the south (>15 miles) of the sea otter range. Although individual otters may wander into areas nearshore of the project area, studies cited earlier could not determine any noticeable disturbance to sea otters, even within a one-mile range from the source. Helicopter noise is also not expected to significantly impact the sea otter population since traffic is not expected to transit the sea otter range. Individual sea otters may experience low impacts, but these are expected to be insignificant. Most likely impacts to the sea otter from noise related to the project's activities is therefore considered insignificant.

The gray whale migration route is relatively narrow and near shore as the whales round Pt. Arguello. Noise emanating from eight platforms could cause modification of the normal migration route. However, since gray whales are not known to feed in the area, it is doubtful that significant gray whale population affects will occur.

Additional noise levels may cause increased stress to gray whales, much the same as industrial noise increases stress in humans. However, the amount of noise anticipated from the proposed action is not anticipated to significantly affect any listed marine mammals due to increased stress. A discussion of some recent studies on the effects of noise on marine mammals is presented in Appendix A.

2. Vessel Traffic

Threatened, endangered, and candidate mammals are not expected to be significantly impacted by proposal-related increases in vessel traffic. Proposed development of the southern Santa Maria Basin will result in only a slight increase in support vessel traffic. The more important potential impacts to applicable organisms associated with increased vessel traffic are the increased potential for vessel collisions that result in oil spills and collisions between vessels and floating/swimming animals. Oil spill impacts are discussed below. All floating or swimming animals are subject to be struck by boats and, while it is not possible to totally eliminate collisions between vessels and marine organisms, the accident probabilities are such that no significant impacts to listed mammals are anticipated.

In all likelihood, the sea otter population will experience very low impacts due to vessel traffic from the proposed projects. The majority of the population occurs north of the project area, and to date only individual otters have been reported in the

project area. Individual sea otters generally are not found far from shore. Most often, individual sea otters are observed seeking shelter in a cove, or within a kelp bed.

Any individual otters occurring in the area will probably not occur in areas transited by oil and gas support vessels due to their affinity for nearshore areas and kelp beds. Oil and gas support vessels will generally be maneuvering between platforms (over three miles offshore) and south between platforms and the onshore crew and supply base. Although support vessels may encounter individual otters, the likelihood of such an encounter is low. Sea otters have existed for a long time within and near several harbors and marinas in central California without incident. Therefore no collisions are expected to occur as a result of this project.

4. Oil Spills

As discussed in Section VI.D of this Biological Assessment, MMS estimates a mean of one (1.04) large spill (>1,000 Bbls.) to occur as a result of this proposal. The mean number of very large spills (>10,000 Bbls.) estimated as a result of the proposal is less than one (0.44). Note that these numbers represent oil spill occurrences and not oil spill contacts or impacts.

It is considered unlikely that any oil spills will contact critical land areas of applicable species. This is based on an initial

assessment of conditional oil spill analyses generated for the EIS for the proposed OCS Lease 80 (Southern California Lease Offering (April, 1984)) and for this reason, significant impacts to threatened, endangered, or candidate species are not likely to occur as a result of the proposed action. MMS reqirements for oil spill cleanup and containment should help to mitigate potential impacts, in the event that an oil spill occurred (see Appendix D).

Additional in-depth oil spill analyses and modeling will be presented in the DEIS/EIR to be prepared for the proposed action. However, based on oil spill data available at this time, it is anticipated that there will be no significant impacts to applicable species as a result of oil spills from the proposal. The potential impacts that could occur in the unlikely event that an oil spill occurred and contacted threatened, endangered, or candidate species, or their critical habitat, is discussed in detail in the FEIS for OCS Lease Sale 73 (Central California) and the Proposed Southern California Lease Offering, April, 1984 (Sale 80) and accompanying documents. These studies are incorporated herein by reference and are summarized in Appendix B.

5. Conclusions - Mammals

Impacts to threatened, endangered, and candidate mammals have been considered above and in the Appendices as a result of noise, vessel traffic and possible oil spills that are associated with the proposed action.

Due to the low levels of normal proposal-related activities (noise,

platform discharges, and vessel traffic), significant impacts to mammals are not anticipated. Eight platforms could cause modification of the normal gray whale migration route. However, since no gray whale feeding is thought to occur in the area, it is doubtful that significant population effects will occur.

Oil spills that are estimated to occur as a result of the proposal (a mean of one (1.04) large spill (> 1,000 bbls) and less than one (0.44) very large spill (>10,000 bbls)) are unlikely to contact critical land areas of applicable mammals, based on initial analyses of conditional probability oil spill data. Therefore, significant oil spill impacts to threatened, endangered, or candidate mammals are not anticipated.

No significant impacts to the southern sea otter are expected to result from activities associated with this project. Available information does not suggest that adverse impacts to the sea otter should be expected from noise sources or vessel traffic. Since the likelihood of an oil spill occurring and contacting the sea otter range is negligible, no significant impacts to the southern sea otter population are anticipated.

C. Reptiles

Four threatened and endangered reptiles have been identified for consideration in this assessment, the green sea turtle (Chelonia mydas), the leatherback sea turtles (Dermochelys coriacea), the Pacific Ridley sea turtle (Hepidochelys olivacea), and the Loggerhead sea turtle (Caretta caretta). None of the above sea turtles

occur with any regularity in the project area. Sightings of these animals have occurred near the project area only on an occasional basis, and none are known to lay eggs anywhere on the California coast. Since all of the endangered sea turtles to be considered in this assessment occur only occasionally off California, and little specific knowledge exists concerning possible impacts to each species from oil and gas activities, the following discussion will consider potential impacts to sea turtles in general.

A review of the potential impact producing agents associated with this project indicates that none of these proposed activities are likely to significantly affect populations of any of the endangered or threatened sea turtles of consideration. However, it is possible that individual turtles may be impacted by the proposed project, primarily as the result of conflicts with support vessel traffic. As discussed earlier, the four species of turtles considered in this assessment are generally found in waters south of the Santa Maria Basin, and it is highly unlikely that large numbers of individual turtles will relocate in the project area. The possibility of a collision with an individual turtle is considered very low, due to their infrequent presence in the project area. Thus, collisions with support vessels, if they occur, will not significantly affect whole populations of endangered turtles. Likewise, other major impacting agents, such as noise, platform discharges, oil spills, and onshore construction activities, are not expected to result in significant impacts to sea turtles which may wander through the project area.

2. Conclusions - Reptiles

None of the proposed activities are considered likely to have a significant impact on populations of any of the threatened or endangered sea turtles under consideration in this assessment.

D. Plants

Two plant species have been identified for consideration in this assessment, the salt marsh bird's beak (Cordylanthus maritimus mortimus), and the Black-flowered fig wart (Scrophularia atrata). Salt marsh bird's beak occurs in the upper reaches of estuaries, and currently is found at only one location in Santa Barbara County. This population, located at Carpinteria, has been requested for consideration due to potential impact from an accidental oil spill.

Onshore construction activities have been proposed between the Point Conception landfall south to Gaviota. The only population of salt marsh bird's beak occurs at Carpinteria approximately 34 miles east of Gaviota, the easthmost of this development. Due to the distance of the proposed activities from this species, disturbances from the onshore construction are not considered as a potential impacting agent to the salt marsh bird's beak. Likewise, platform discharges and vessel traffic are not considered as potential impacting agents to the species.

The black-flowered fig wart occurs as a common species at several locations nearby the project area, well above the high tide level and primarily to the north of the proposed landfall at Point Conception.

An adverse impact to this species could arise only from a physical disturbance associated with the onshore development activities. Due to its location above the high tide level, platform discharges, vessel traffic and oil spills are not considered as potential impacting agents to the black-flowered fig wart.

It is possible, but highly unlikely, that physical impact to these species could occur during oil spill containment activities, if an oil spill approached the species habitat.

1. Salt marsh bird's beak

The only potential impact producing agent from this project which could affect the salt marsh bird's beak is an accidental oil spill. The likelihood of oil entering the estuaries habitat occupied by their species, however, is very low. In addition to the already low expectations of a large spill, oil spill containment equipment is very effective in closing off entrances to estuaries. In the unlikely event that oil did enter an estuary the salt marsh bird's beak would be vulnerable only on a high tide. If contacted, individual plants could be smothered by the oil and die. Since the likelihood of an oil spill occuring and entering an estuary containing this endangered plant is very low, and there are several other populations of the salt marsh bird's beak located far away from any areas of potential contact by oil, adverse impacts to this species are considered low.

2. Black-flowered fig wart

This species is found at several locations throughout Santa Barbara County, but is most common north of Point Conception. The black-flowered fig wart is being considered for listing by the USFWS due to potential hybridization with another species of fig wart (S. Californicus), not because of a limited distribution or low population. Several occurrences of a hybrid Scrophularia have been recorded south of the Point Conception area, near Goleta and Santa Barbara.

In spring of 1983, Chevron contracted for a study of flora and fauna along the entire proposed pipelines route from the landfall north of Point Conception to Gaviota. The onshore development site at Gaviota was also surveyed. Results of this investigation have been submitted to the MMS and are contained in Chevron's Environmental Report. This survey did not identify any black-flowered fig warts or any hybrid Scrophularia anywhere along the pipeline corridor or at the Gaviota construction site. (The fig wart threatening hybridization, Scrophularia californicus, was observed at several locations along the pipeline route.)

Adverse impacts to this species could arise only from a physical disturbance associated with onshore development activities since the species occurs well above the high tide level. However, due to the absence of this species from the area to be impacted by this development, results of this study indicate that no impacts are expected to the black-flowered fig wart resulting from the onshore construction proposed by this project.

3. Conclusions - Plants

None of the proposed activities are considered likely to have a significant impact on populations of the two plants under consideration in this assessment.

VIII. CUMULATIVE IMPACTS

The southern Santa Maria Basin project scenario is one of several major oil and gas projects likely to be active in the western Santa Barbara Channel-Point Conception/Pt. Arguello region within the next 10 years. A list of these projects includes: the marine terminal and supply base proposed by Getty near Gaviota, Los Flores marine terminal, ARCO's Coal Oil Point development, Exxon's Santa Ynez Unit development, and development expected to result from previous discoveries in the central Santa Maria Basin (for example, Union's OCS-P 0441 and Exxon's OCS-P 0440). Pending activities which may occur include the California State Lands Commission lease sale between Point Conception and Point Arguello, exploratory operations on existing leases, and OCS Lease Sales for North/Central and Southern California. A number of non-oil related activities are also planned in the project area during the same period. For the most part, these are small, onshore activities whose impacts to rare and endangered organisms are generally not significant.

The impacting agents from expected oil and gas activities are similar from one project to another and have been discussed earlier in this assessment. Specific impacts to threatened and endangered organisms will also be similar from project to project. Daily activities associated with these expected projects will contribute to conditions which might further stress endangered species. Normal, daily operations are expected to cause only low to moderate impacts to endangered species included in this assessment.

Whales, specifically gray whales, may be the more affected species by future oil and gas development in the southern Santa Maria Basin. The concentration

of human activity and facilities near Point Conception could modify migratory routes. However, since gray whales are not known to feed in this area, impacts are not likely to be significant.

As the number of oil and gas operations increase, the probability of an oil spill increases. Thus, the cumulative impacts to species like the least tern and brown pelicans are considered moderate because their nesting and feeding habitats may be affected by an oil spill. According to MMS, 1983a, oil spills from cumulative oil and gas activities are not likely to contact the Southern sea otter range. Therefore, significant cumulative impacts to this carnivore are not anticipated.

In conclusion, the project scenario is one of several major oil and gas proposals and other activities in the area, thereby representing only a partial incremental increase to the future activities for the area. MMS is keenly aware of the importance of cumulative impacts in the Pacific OCS Region and will closely study new hydrocarbon proposals as they are submitted.

APPENDIX A

SUMMARY OF SOME RECENT STUDIES OF NOISE EFFECTS ON MARINE MAMMALS

Proposal generated noise may result in a variety of potential effects on marine mammals in general. See Section VII of this assessment for the most likely impacts associated with the proposed action.

The variability of the effects of general noise on marine mammals was noted by Cowles (1981). In a study of platform noise, Gales (1982) concluded that although low frequency components may be detected on the order of hundreds of miles, a more likely range for the detection by whales was on the order of 150 yards for the Santa Barbara offshore area.

Some marine mammals are apparently able to acclimate to some level of human activity in their environment. Gales (1982) reported field observations that indicate whales either avoid or ignore platforms with no appreciable change in behavior. Lecky, et al (1979) noted that noise generated by exploratory drilling activities did not appear to bother migrating gray whales in San Pedro Bay. During a three-year study of cetaceans in the Santa Barbara Channel, Dohl, et al. (1979) reported an increase in the gray whale population during a period when general offshore noise pollution and human disturbances were also increasing.

Increased aircraft traffic (primarily helicopters) is often associated with offshore oil and gas development. Thre is some concern that increased noise from this source will alter behavior patterns of cetaceans. In a statement to

the California Coastal Commission (May 25, 1983), Steve Leatherwood of Hubbs Sea World reported that gray whales appeared unaffected by noise from helicopters being flown at an altitude of 1,000 feet or greater.

Several sources of information on underwater noise sources and characteristics are available which discuss the potential impacts of noise on cetaceans. The following documents are therefore incorporated here by reference: USDOI, Minerals Management Service, Alaska Region, Draft Environmental Impact Statement Proposed Diapir Field Lease Offering, June 1984 (1983) and the Final Environmental Impact Statement Proposed Outer Continental Shelf Oil and Gas Lease Sale St. George Basin, Sale 70 (1982), Sale 73 Biological Opinion (NMFS), Gales (1982). The response of animals to acoustic stimuli has generally shown variance in behavioral and physiological effects, dependent on species studied, characteristics of the stimuli (e.g., amplitude, frequency, pulsed or non-pulsed), season, ambient noise, previous exposure of the animal, physiological or reproductive state of the animal, and other factors.

Research on effects of noise, particularly that associated with oil and gas operations on endangered cetaceans has, until now, been limited. Presently existing field observations of responses of cetaceans to disturbance provide some index of sensitivity of whales to noise and disturbance. Noise, including seismic activity, is believed to be a by-product of normal OCS industrial activities that may be most likely to affect whales significantly (Fraker, et al. 1982). According to the National Marine Fisheries Service (NMFS) Sale 72 Biological Opinion, geophysical seismic exploration produces loud sounds which propagate long distances from their source. Source levels of 240-270 decibels

relative to one micro Pascal at one meter and frequency ranges of 100 to 300 Hertz characterize geophysical seismic noise. Received noise levels will be less than produced levels and the rate of decay will depend on bottom absorption ability, the type of spreading (cylindrical or spherical) and other physical factors. The Acoustical Society of America (1980) has also estimated maximum source levels at 230-270 decibels relative to one micro Pascal at one meter for various types of activities associated with seismic exploration. These are classified as the highest sound pressure levels associated with offshore oil and gas operations - pulses are of short duration (generally less than one second) and are generated intermittently for relatively short survey periods (on the order of a few months) in any given area (Gales 1982). Seismic surveys may also be interrupted for a period of several hours or days. Fraker, et al, (1982) indicated that right whales are known to produce sounds at 172-187 dBA relative to one micro Pascal at one meter.

Concern has been expressed by some cetacean researchers that if the sound source is close enough and the intensity is loud enough, disturbance and displacement of whales, and perhaps some physical impairment of cetacean hearing could occur (Braham, et al, 1982). Possible auditory effects from high level sounds include startle, flight (rapid escape), hearing loss, and auditory discomfort due to excessive loudness (Gales 1982). A possible additional effect is the masking of wanted sounds, such as communication. Although little information is currently available on the sounds perceived by large whales (absolute hearing thresholds in baleen whale have not been measured), it is generally assumed that most animals can hear sounds similar to those that they produce (Gales 1982). Therefore, the following analysis assumes that the cetaceans considered in this assessment are able to perceive normal geophysical sounds associated

with OCS activities.

Available information indicates that gray whales may display a high degree of tolerance to geophysical seismic noise. Extensive geophysical exploration has been conducted off the California coast for more than 35 years, yet during that same period the gray whale has recovered to population levels at or above precommercial whaling levels. Reilly (1981) estimates that over the last 13 years, the population has been increasing at an average annual rate of 2.5 percent, in spite of increased vessel traffic, offshore mineral exploration (including deep and shallow seismic activities) and development, and Soviet harvest of 1.2 percent of the gray whale population. This rate of growth and the apparent fitness of the population is not consistent with the hypothesis that geophysical exploration may be damaging to the gray whale population. For example, with respect to the gray whale in Southern California, CCMS (1980) concluded that, "The reasons for this apparent increase in utilization of offshore waters are unknown, but might be the result of increased human activity in the bight, increased gray whale numbers, or some combination of both factors." There are no confirmed reports or documented evidence of this species actively and consistently avoiding exploratory or production platforms, helicopters, seismic operation, or other OCS activity; in fact, numbers of gray whales near shore along the California coast have remained relatively stable in spite of human activities, including oil exploration (personal communication, T.P. Dohl, University of California at Santa Cruz, 1980). A recent Task Force Report on Geophysical Operations (1982) submitted to the executive officer of the California State Islands Commission determined that no evidence was found to suggest that airguns and other nonexplosive acoustic sources cause injury to marine mammals, including gray whales.

In addition to the above conclusions reached regarding physical harm and mortality, a recent MMS sponsored airgun source experiment off the California coast on gray whale behavior can be summarized at this time.

It should be pointed out that much of the seismic work for the project scenario has been completed. Seismic work has been done for proposed platforms Hermosa, Hidalgo, and Harvest and their associated pipelines. This includes the subsea pipeline from Hermosa to shore. All future seismic work is limited and will be conducted on offshore platforms and pipelines which lie a good distance from the gray whale migration route. All future surveys will occur outside of the State three mile line, which is located three km or more away from the route.

Airgun array tests were conducted with nominal ranges of 83, 33, 13.8, 5, 1.6, and 0.84 kilometers to the observation area. Estimated peak sound levels in the area of the whales, producted by the array and single gun sources, were 180 decibles $\pm$ 10 decibels relative to one micro Pascal at one meter. The whales came as close as five kilometers to the airguns before some behavioral changes were noted. Some possible changes in the swimming patterns of the cow-calf pairs were observed. More obvious changes were observed in the 1.6 kilometers and 0.84 kilometers nominal test ranges. The changes observed typically consisted of confused swimming, swimming into the surf zone or behind rocks when sounding shadowing was available. Rolling and milling behavior was also observed often followed by rapid swimming to avoid the source area. However, no whales became beached and all resumed their migration. The single gun measurements were conducted at five, 1.6, 0.843 and 0.15 kilometer nominal ranges. Obvious swimming behavior changes were observed at ranges from 650 to 900 meters. The behavior observed was similar to that seen previously for the full array at the 1.6 kilometer range. However, the number of observations

obtained with the single airgun was limited by the decline in the migration density. In addition, it should be noted that the above study used a deep-seismic system on both the single airgun and array tests; this system, as described earlier, is far more powerful than the relatively quiet, high-resolution, shallow systems.

A review of recent studies by Malme et al, (1983) is provided below.

The playback tests demonstrated that gray whales have hearing thresholds below that of the prevailing ambient noise levels in the observation area (central California). Whales exposed to Orca, drilling platform, helicopter, and production platform stimuli showed avoidance responses in which tracks were deflected away from the source playback stimulus. An annoyance reaction was considered to have occurred because of an apparent avoidance of the source area out to ranges of about 250 meters from the drilling platform and helicopter sounds. The sound levels at this range were about 111 to 118 dB relative to one micro Pascal at one meter. Other industrial noise stimuli with smaller, short-term fluctuation levels but with equal or somewhat louder sound levels did not produce a detectable annoyance reaction. The behavior observations for the playback stimuli suggest that only the loudest, most raucous industrial noise sources have an observable behavioral impact on migrating gray whales.

No reactions by mother/calf pairs were noted by shore observers at the time of observation during the GSI seismic airgun array line runs of the CECIL H. GREEN II at distances of 5-83 kilometers. However, during the close runs of 0.84 and 1.6 kilometers, shore observers noted the following changes in behavior. The whale groups exposed to sound levels of greater than 160 dB were seen to change direction (orientating south), move inshore, and mill about for varying lengths

of time. It is important to note that in each of these cases, the airgun was turned on when whales were within 1 km, therefore, the whales were immediately exposed to a level greater than 160 dB. This dramatic response could therefore be considered a startle response. During the time periods when the whale groups were exposed to sound levels of greater than 160 dB, some surface behaviors were observed but the predominant behavioral change was change in orientation with few surface behaviors observed. In each case, the group immediately turned south and swam away from the source (April/May experiments). The distances between the airgun array vessel and a group when it showed an obvious reponse at the time of observation were consistently on the order of 2 km. The distance at which these groups resumed normal migration ranged between 3.6 km to 4.5 km. Cumulative effects of multiple seismic operations along a migration path are potentially disruptive in view of the observed impact in the test are (central California).

In summary, the weight of the evidence indicates that the use of airguns for high resolution surveys in geophysical exploration in this area may not affect the fitness of the gray whale population. Simulative impacts throughout the migration route are potentially disruptive, however, population fitness may not be expected to be altered due to their exposure to seismic activities resulting from this project.

APPENDIX B

SUMMARY OF SOME RECENT INFORMATION ON OIL SPILL EFFECTS ON MARINE MAMMALS

A. *Southern Sea Otter*

The sea otter is known to be highly susceptible to adverse effects from contact with oil spills or other fur soiling agents. Sea otters utilize fur and trapped air rather than blubber for insulation. Regular grooming is necessary to maintain the insulation layer. In the Biological Opinion for Lease Sale 73, the USFWS stated "Direct contact with oil would mat the coat and decrease the otter's natural insulation against temperature loss, resulting in hypothermia and death of individuals." Kooyman and Costa (1979) estimated oiling of 20 percent of a sea otter's fur could result in mortality. In addition to loss of heat, constant grooming required to maintain the insulating quality of the coat would result in the direct ingestion of some petroleum products. The USFWS also cited unpublished data (Kenyon) reporting, "The accidental exposure of two sea otters to a small but unknown amount of oil (probably diesel) in a experimental holding pool on Amchika Island resulted in fur matting, progressively severe distress, emergence from the water, and death by exposure within several hours. The oil in this case formed a visible sheen comparable to that sometimes present in harbor areas where gulls appear unaffected by it." Sea otters are also highly susceptible to temporary reductions in food sources since they also rely on a high caloric intake to maintain body temperature. The diet of sea otters is primarily composed of

benthic invertebrates such as clams, abalone and sea urchins. The settling of oil to the bottom could adversely impact these benthic invertebrates either by smothering or from toxic effects. Mortality of these prey items could create a local loss of food sources to the sea otter, resulting in starvation of otters and/or an overcrowding of adjacent habitats due to the dispersal of sea otters searching for food. In addition, the tainting of these food sources by oil could increase the oil ingestion effects discussed earlier, especially if contamination was widespread enough to allow ingestion of numerous tainted organisms.

Oil spill effects would be increased in the winter season when kelp beds have died back or torn away from holdfasts. Otters tend to concentrate in the remaining kelp. Oil tends to concentrate in the same kelp. Additionally, the Davidson Current could carry oil north during the winter. (Seasonal aspects of the oil spill model take the Davidson Current into account.) Storms would limit containment and cleanup of an oil spill but allow for more rapid weathering and mixing.

Guadalupe Fur Seal

Guadalupe fur seals are highly susceptible to oiling, but the number present in the project and nearby areas is so small as to not be considered a population. However, should these seals recolonize San Miguel Island, and a proposal-generated spill occurred and contacted inhabited areas, impacts could be high to very high. The probability for such an event to occur, however, is very low.

Cetaceans

Whales occupy surface waters to breathe, and some to feed, potentially

exposing them to spilled oil by contact, inhalation or ingestion (Geraci and St. Aubin 1982). There is little evidence, however, that endangered cetaceans are able to detect hydrocarbon pollution. Accounts from past oil spills show that maine mammals such as seals and sea lions may not avoid oil; however, there has yet to be found a confirmed case of a whale, dolphin, or porpoise coated or fouled with oil (Geraci and St. Aubin (979) as a result of contact made while alive. Toothed shales may be more likely to detect oil due to certain sensory capabilities (Geraci and St. Aubin 1980). In Alaskan waters, two killer whales, one sick and one dead, were observed in association with an oil spill (Anonymous 1971), but a precise causal relationship was not established. Duguy (1978) reported the presence of petroleum hydrocarbons in the intestine of a stranded bottlenose dolphin, without evidence to suggest that oil ingestion had been responsible for the stranding and death of the animal. More recently, two accounts of whales and dolphins swimming and feeding in oil slicks (Goodale et al. 1981; Gruber 1981) have been reported. In addition, Geraci and St. Aubin (1982) suggested that bottlenose dolphins, studied under optimum light and water clarity conditions, used echolocation alone to detect thick patches of heavy oil, particularly if the substance contained air bubbles as a result of churning by wind and wave action. It remains unknown whether dolphins can see these substances at night or in turbid water. Further laboratory studies by Geraci and St. Aubin with bottlenose dolphins suggested that avoidance behavior was clear and consistent--the species repeatedly avoided a controlled slick of non-toxic colored mineral oil that the authors knew they could detect. Each time a dolphin contacted oil, it responded by abruptly diving, and quickly returning to an oil free area, even though the mineral oil was innocuous.

At sea, this response might be modified by social interaction, feeding, agonistic behavior, migration, or human activity (Geraci and St. Aubin 1982).

Direct response to oil spills by free-ranging cetaceans has only recently been observed (Geraci and St. Aubin 1982). Swimming speeds, surfacing and diving times, and respiratory rates of small groups of gray whales migrating through an area containing naturally occurring oil seeps were compared in relation to the presence and extent of oil. Typically, the whales were observed swimming through the oil at a modified speed but without a consistent pattern. Geraci and St. Aubin (1982) noted some changes in the respiration behavior of whales when in oil-contaminated areas. In oiled waters, the whales seemed to spend less time at the surface, blowing less frequently but at a faster rate. If this reaction is interpreted as an avoidance response, it suggests that gray whales can detect oil. Whales showing no response either could not detect the amount or type of oil present, or were indifferent to it (Geraci and St. Aubin 1982). However, these comparisons are not firmly supported, as it was not possible for the authors to follow specific whales into and out of the oil areas.

The nature of cetacean skin suggests that whales may be vulnerable to effects of surface contact with hydrocarbons (Geraci and St. Aubin 1979). The epidermis is not keratinized, but composed of live cells (Geraci and St. Aubin 1979) surprisingly rich in enzymes and vitamin C (St. Aubin and Geraci 1980). Geraci and St. Aubin (1979) reported that cetacean epidermis is virtually unshielded from the environment and may react to substances

such as crude oil and gas condensates in a manner similar to sensitive mucous membranes. Any substance which affects the skin may have far-reaching consequences for these animals. However, field observation of at least one instance of possible contact of gray whales with spilled oil did not show evidence of extreme effects. In 1969, the entire northward migration of gray whales passed through or near the area contaminated by the Santa Barbara Channel spill, yet the number of gray whale strandings was not significantly different from previous years (Brownell 1971). Gas chromatograph analysis of tissues of gray whale stranded in the vicinity of the spill did not indicate the presence of crude oil. Concern has been expressed by Albert (1981) that bowhead tissue analysis suggests that eroded areas on the skin and the animal's eyes may also be sensitive to oil contact. However, such concerns remain untested hypotheses.

More recent laboratory studies by Geraci and St. Aubin (1982) using bottlenose dolphins as their principal subjects revealed that dolphin skin exposed to gasoline and crude oil showed no gorss evidence of damage or loss of integrity. Although exposed skin turned a pale gray in color, it always returned to normal color within two hours. On the other hand, human skin similarly treated showed more extensive irritation. Other histological and ultrastructural studies by Geraci and St. Aubin (1982) on dolphins showed that petroleum hydrocarbons produced mild and transient damage to cells of the epidermis, although the cells showed signs of recovery within three to seven days. Other surface contact studies by the same authors include studies to determine the progress of healing of oil-contaminated versus uncontaminated cetacean wounds, and studies of biochemical processes of epidermal cells for evidence of functional damage due to oil. In all

of these surface contact studies, the morphological changes were reversible even after prolonged exposure (75 min.). However, the authors did not determine whether biochemical changes impair the functional integrity of the skin. These findings suggest that oil contact with the epidermis of other cetaceans would probably have similar sublethal effects.

In addition to potential cutaneous contact with oil (or gas), inhalation of toxic substances or plugging of blowholes by oil have been cited as possible threats to cetaceans. Certainly, the form is a possibility to the extent that whales may be in the vicinity of a spill prior to the evaporation of toxic compounds. The latter event would be very unlikely to occur. The typical breathing cycle of cetaceans involves an "explosive" exhalation followed by an immediate inspiration and an abrupt closure of the blowhole (Geraci and St. Aubin 1979). This mechanism prevents inhalation of water and should be discriminatory of gas condensates and oil; however, toxic hydrocarbon gas could be inhaled. The effects of gas condenstate or gas vapor inhalation on cetaceans are unknown. In addition, it is unknown whether endangered whales would ever inhale sufficient vapor or oil in the open environment to create irritation to respiratory tissue. Cetaceans that are already stressed by lung and liver parasites and adrenal disorders might be particularly vulnerable to the effects of even low levels of hydrocarbon vapors (Geraci and St. Aubin 1982).

Cetacean vulnerability to hydrocarbon ingestion would vary with species, type of hydrocarbon, and nature of the spill. Tomilin (1955) reported that cetaceans, especially benthic feeders, have a poorly developed sense of taste, and the presence of foreign bodies in cetacean stomachs attests

to this. Thus, whales may not be able to differentiate between hydrocarbon contaminated and uncontaminated food.

Another potential direct effect of spilled oil on whales is fouling of baleen, with a subsequent decrease in feeding efficiency. The probability of such fouling and effects on feeding efficiency are directly linked to probabilities of spills and whale contact with such spills. Results of experimental research suggests that oil, under controlled conditions, may reduce the filtering efficiency of bowhead baleen (Braithwaite 1980). More concise fouling studies by Geraci and St. Aubin (1982) conducted on fin and gray whale baleen plates showed conclusive evidence that although the filtering efficiency of baleen was temporarily reduced by crude oil for up to 15 minutes, normal flow patters were always restored. These observations alleviate the concern that crude oil would irreversibly obstruct water flow through baleen. However, it is unknown whether the persistence of oil on the fibers would contaminate food sources or cause them to adhere. Prolonged impairment caused by repeating fouling might affect feeding activity and, therefore, diminish blubber stores which would be essential during migration and other periods of fasting. Predicting eventual population response on endangered whales as a result of baleen fouling would depend on the number of whales affected and the degree and frequency of contamination. The above data indicates that reduced filter feeding efficiency from oil contamination of baleen would be a short-term effect.

APPENDIX C

POTENTIAL IMPACTS TO BIRDS FROM AN OIL SPILL

A. Birds

A number of factors influence the vulnerability of difference species of birds who contact with spilled oil. Factors increasing vulnerability include: 1) tendency to form large, dense flocks on the water; 2) existence of certain species only as small populations; 3) considerable time spent swimming on the water; 4) a feeding behavior which entails diving into the water; and 5) tendency to dive when alarmed. On the other hand, species which have the following characteristics are likely to be less vulnerable to spilled oil: 1) foraging done by widely dispersed individuals, 2) foraging onshore, and 3) a tendency to fly rather than dive when alarmed.

Most incidents involving ingestion of oil by birds apparently occur during preening (Nero and Associates 1982). Acute toxicity may result. Recovered birds have shown wasting of fat and muscle tissue, abnormal conditions of major organs such as the liver, kidneys, and adrenals, and inhibition of pituitary function (Holmes and Cronshaw 1977). Recovered birds also show symptoms of severe dehydration (Berkner, personal communication), apparently caused by malfunction of the salt gland which regulates the water/salt balance. Several salt excretion studies indicate whether crude may be the most toxic form of oil in respct to maintenance of water/salt balance (Clark, in press).

Increased mortality may occur in bird eggs contaminated with fresh crude

from the adults. This has been demonstrated for mallard ducks, Cassin's auklets and gulls (Clark, in press). Brown pelican eggs were found contaminated on the east coast, but no study was made of the mortality.

Longer term or sublethal effects of oil include delayed and depressed egg laying, reduced hatching, and reduced growth rate due to poor nutrient uptake. Experiments on sublethal effects have been limited. Some of the observed effects are undoubtedly due to laboratory conditions, and applicability of these experiments to the marine environment has yet to be determined (Clark, in press).

Birds that do not die from ingested oil would likely suffer reduced health, and generally animals in poor condition do not survive very long in the natural environment. The level of mortality due to the toxicity of oil cleaned from feathers or ingested with food is uncertain. However, these impacts could add to the direct contact effects and delay recovery time.

Estuarine habitats such as used by least terns and rails are potentially the most severly impacted. These species are estuaries for both feeding and breeding. A large oil spill that entered an estuary might destroy nesting sites and feeding areas for two to ten years (Woodward-Clyde 1982). The other endangered bird species which are less dependent on estuarine habitat would not be severely affected.

An oil spill can also impact endangered bird species by affecting their food source. For example, brown pelicans are almost entirely dependent on anchovies as a food source, and a significant correlation has been noted

between anchovy populations and pelican breeding success (Southwest Fisheries Center 1983; Gress and Anderson 1982). Therefore, an oil spill which significantly affects the anchovy population would probably affect pelican reproductive success, potentially resulting in a significant impact to the regional brown pelican population.

Use of dispersants following an oil spill may present a hazard to endangered bird species which come in contact with the ocean surface, primarily the brown pelican. Testing on birds has been limited, but results show that dispersants capable of breaking up petroleum will also break up the protective oils coating bird feathers, ultimately resulting in death of some exposed birds. Overall impacts to bird populations, while comparable to those of an oil spill, are expected to be less severe due to the fact that the ocean area sprayed with dispersant will usually be much less than the area covered by a spill and because dispersants can be used to control the quantity of oil impacting sensitive habitats.

APPENDIX D

OIL SPILL CLEANUP AND CONTAINMENT

A. Capabilities

Minimizing negative impacts to the environment from offshore oil spills has been a prime concern of government and industry for many years now. As a result, stricter environmental/operational regulations have been issued, oil spill cleanup devices have been developed and improved, and research efforts continue for more efficient cleanup techniques.

The regulations addressing cleanup include the U.S. Department of the Interior Pacific OCS Orders governing oil and gas lease operations. Order numbers 2, 5, and 7 specifically address blow-out preventors, pollution-prevention equipment, oil spill contingency planning, personnel training requirements, and the maintenance of on-site oil spill containment and recovery equipment. The on-site equipment requirements include 1,500 feet of open ocean boom with deployment and recovery capabilities. The on-site requirements of spill response capabilities apply to operators of both exploration and development activities. These requirements have resulted in the ability to handle most minor spills, a significant capability in addition to the cleanup cooperatives. In addition to these operating orders, a memorandum-of-understanding (MOU) commandant notice No. 5740 between the U.S. Coast Guard (the lead agency pre-designated as on-scene coordinators for OCS oil spills) and the Minerals Management Service specifically lists guidelines for contingency planning and cleanup ability requirements. This MOU is currently in effect. Both the Coast Guard and the Minerals Management Service review serious accidents and take

corrective actions to prevent recurrence.

There are a large number of cleanup devices commercially available, including oil spill booms (both open-ocean and harbor), skimmers, oil/water separators, pumps, absorbents, chemical dispersants and collecting agents. The current cleanup capabilities (specifications) of the mechanical devices now available are listed below. The manufacturers report that heavy-duty open-ocean booms (such as the Clean Seas Bottom Tension Boom) are capable of oil containment in 25 knot winds and 6-8 foot seas, in currents up to 1.25 knots. Recovery ability through the use of oil/water separators and oil skimmers (such as Clean Seas Skimmer System) is as much as 2,000 gallons per minute (GPM) for oil (in water) of grades ranging from light to Bunker C (heavy), in moderate seas. Efficiency rates of skimming systems can be as much as 100 percent under ideal conditions (Clean Seas Oil Mop, Inc. MK-II-9). Efficiency rates for containing and recovering spilled oil are greatly reduced in high wind and sea states and with high viscosity oils. When sea states and wind conditions start getting harsh, oil begins to get entrained above and below the oil boom, and skimmer and oil/water separator efficiencies decrease (more and more water is recovered with the oil). It is generally considered safe to deploy equipment in approximately 4-5 foot seas and 20 knot winds. However, when the weather is rough, although the cleanup equipment is not as effective, natural oil dispersion is greatly enhanced by the increased wave action (high surface energy level). There is additional equipment which can be deployed in weather conditions worse than 4-5 foot seas and 20 knot winds. Equipment currently on the California OCS is routinely deployed in such weather (Capn. Beaudin, Eleventh Coast Guard District, 1983). Wave period will also affect recovery ability.

Long, slow waves will allow for greater recoverability than waves at a higher frequency with a shorter period.

In the case of "high pour point" or very viscous oils spilling, additional efforts would be required during a spill cleanup operation. Although very viscous oils can be corralled by standard oil spill booms, it may be very difficult to recover the boomed oil by standard oil skimming devices. In addition, chemical dispersants are also less effective on high viscosity oils, as the oil/water interface is less accessible to the dispersant, the dispersant having a tendency to "roll-off" the oil. Absorbent materials (pads, straw) would be necessary to soak up the oil (either within boomed off areas or open waters) and then manual labor efforts (shovels, pitch-forks, etc.) would be required to remove the oil soaked sorbents from the environment. The West Coast oil spill cooperatives have this capability. In addition, the co-ops are currently purchasing new cleanup equipment more suited for recovering heavier oils.

When mechanical cleanup is not feasible due to weather conditions or other reasons, chemical dispersants may be applied either from the air or surface ships. Chemical dispersant technology has been advanced significantly in the last few years, reducing toxic chemical effects from the dispersants themselves while increasing dispersant efficiencies. A rigorous approval policy for dispersant use must be followed before application is allowed (Smith and Pavia 1983).

Although the use of chemical agents to facilitate oil spill cleanups is discouraged, they may be used at the discretion of the on-scene coordinator (OSC) to reduce an immediate threat to life or property. In other instances,

a senior EPA official will decide whether it is appropriate to use dispersants after going through an extensive the checklist and after consultation with the OSC and State and Federal representatives (members of the Regional Response Team - RRT). The RRT is made up of Federal and State Agencies responsible for responding to and planning courses of action in the event of environmental emergencies, such as oil spills. The EPA maintains a list of pre-approved chemcial dispersants that may be considered for use. The proceedures for dispersant approval are currently being modified.

A significant distinction exists between using chemical dispersants and conventional mechanical cleanup techniques to deal with an oil spill. Dispersants do not actually remove the oil from the environment, but rather act to breakup slicks, allowing faster/greater dispersion by wind and ocean currents, and increased biodegradation, sinking, and evaporation. Dispersants therefore represent an environmental trade-off, for example, by preventing oil from contacting a sensitive area but increasing the oil dispersion through the water column. The environmental/ecological damage may be less, though not entirely eliminated.

As more research is done, the effects of chemical dispersants will be better understood. Mackay, et al. (1983), have done work determining the effectiveness, behavior, and toxicity of dispersants. The purpose is to establish a "predictive framework" - to identify the overall impacts of using dispersants when evaluating the best cleanup strategy. Filfillan, et al. (1983), compared the effects of dispersed and nondispersed oil on intertidal infaunal community structure. The conclusions of their work, to date, were that: (1) no evidence of any adverse effects was observed using dispersed oil under real spill conditions; (2) there was

clear evidence that the undispersed oil treatment resulted in the mortality of commercially important bivalves, allowing increased densities of opportunistic polycheate worms; and (3) the consequences of untreated oil areas were consistent with real-world spills. Page et al (1983), studied the long-term effects of dispersed and undispersed oil in nearshore environments (less than 4 m deep). The conclusion was that incorporation of dispersed oil into the intertidal benthos is small compared to shoreline impacts followed by conventional cleanup procedures.

It appears now that the "last-resort" attitude towards dispersants is beginning to change. The EPA is considering streamlining the approval process, and a new policy statement is expected within the year. A multidisciplinary task force (industry, government, academia) is currently developing ecologically based guidelines for dispersant use, with the intention of minimizing ecological damage from oil spills. Dispersants are being considered on an equal level with other cleanup alternatives, including the "no action" option. A final report is expected soon.

At present the oil spill cleanup cooperatives with the assistance of the Coast Guard and the on-site oil company equipment are capable of handling the cleanup of most oil spills (less than 1,000 bbls). The chief limiting factor would be weather conditions (rather than equipment) at the time of the spill. In the event of a large spill or a spill during harsh weather, dispersants may be applied, as avoidance of oil contact with shoreline or island areas is the primary concern after personal safety, adding significantly to the arsenal of oil spill countermeasures.

B. Cooperatives

The oil companies have pooled their resources by forming oil spill cleanup cooperatives. There are currently two such co-ops in Southern California: Clean Seas in the Santa Barbara Channel and Santa Maria Basin area, and Clean Coastal Waters in the San Pedro/Long Beach area. Additional cleanup capabilities are found at the four other co-ops on the West Coast, the Coast Guard Pacific Strike Team located in San Rafael, and other Coast Guard facilities, which would all be accessed in the event additional assistance is required (all available equipment and personnel from around the country would be made available in the event of a catastrophic spill). The co-ops are on 24-hour call and have several vessels dedicated for cleanup operations. The co-ops have the capabilities as called for by the MOU (mentioned above) to respond to an oil spill emergency within 6-12 hours with pre-staged equipment, and 48 hours with additional equipment for extraordinary spills. The co-ops have pre-staged equipment vans at strategic locations. The co-ops also have pre-established plans and equipment for protecting specific creeks and estuaries from oil spills.

The oil spill co-ops will expand their operating budgets proportionately, as increaesd offshore oil activity requires additional equipment and personnel to maintain an adequate level of protection and preparedness. The co-ops are constantly evaluating and purchasing new equipment, as the oil spill clean-up industry is rapidly changing.

C. Contingency Plans

To implement the Clean Water Act (1973), as amended, the President's Council on Environmental Quality (CEQ) developed the National Oil and Hazardous

Substances Pollution Contingency Plan. It follows specific legislative directions to include: (1) the duties and responsibilities of each Federal agency in coordination with State and local agencies; (2) a strike force of trained personnel available to provide the earliest possible alert to a discharge; (3) a system of surveillance to provide the earliest possible notice of a discharge; (4) a national center to coordinate the plan; and (5) procedures and techniques for identifying, containing, and removing the discharge or dispersing it, if necessary.

In addition, the CEQ requires a detailed oil spill contingency plan for every exploration and development plan submitted. This plan shall include emergency procedures and contact personnel, documentation of environment areas to be protected, actual plans to follow in the event of a spill, containment and cleanup measures, and oil spill response training requirements.

The Environmental Protection Agency and the Coast Guard are the enforcing agencies for the Clean Water Act. These agencies have the authority and the capacity to marshal the nation's capabilities to combat oil spills.

As a standard part of any OCS lease, OCS Order No. 7 requires oil spill equipment to be at the site of any drilling or development operations, and all of the requirements listed above to be met, including a detailed site specific oil spill contingency plan.

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May-Jul
Aug-Nov
Dec-Feb

Talk to Herb - contact Mark Helvey about EFH consultation + ESA-species.

Arguello BA

- Analyzed "proposed project" is 8 platforms + assoc. pipelines in 25-tract area (actual proposed project - 3 platforms, assoc. pipelines, + onshore facility (Gaviota).
  * one of the 8 platforms is on P-0452 (in Rocky Pt.).
  Platform Hermosa - 48-slots - 602 Ft. -
  ~7.3 mi S Pt. Arguello
  - prod. expected to peak in 1989 at 27K bbl/day.

(p.64) For analysis, used launch areas E17 + E18, + pipeline segments L6 + L8 from Sale 80
- oil spill risk discussion based on Sale 80 analyses - incorporates impact discussion from Sale 73 FEIS.

(p.80) - Concludes that "the likelihood of an oil spill occurring and contacting the sea otter range is negligible."

p.86 - Lists scen. proposed future activities in Fed. + State waters.

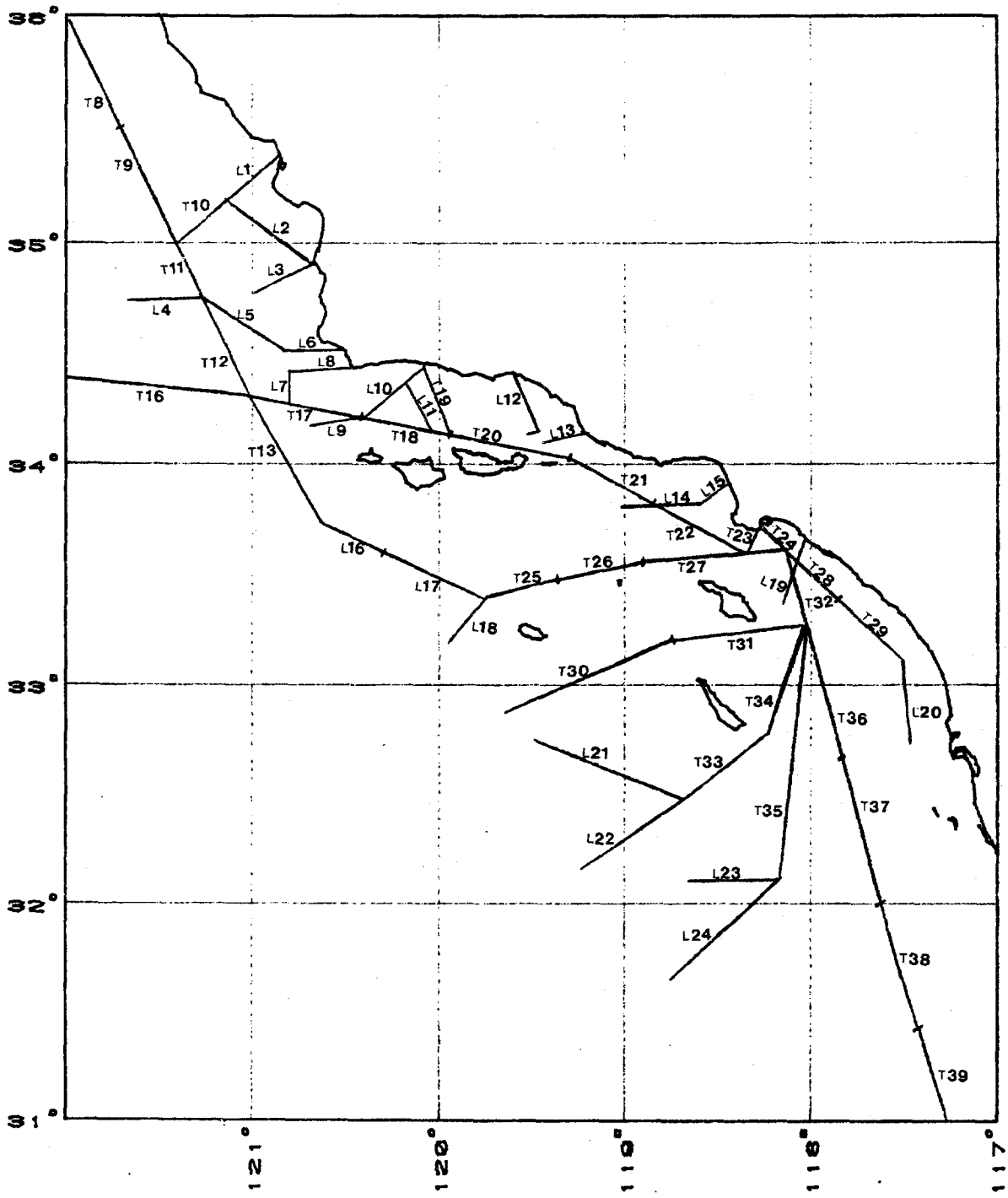

Figure 5a. -- Enlargement of subset of Figure 5, showing numbered transportation route segments.

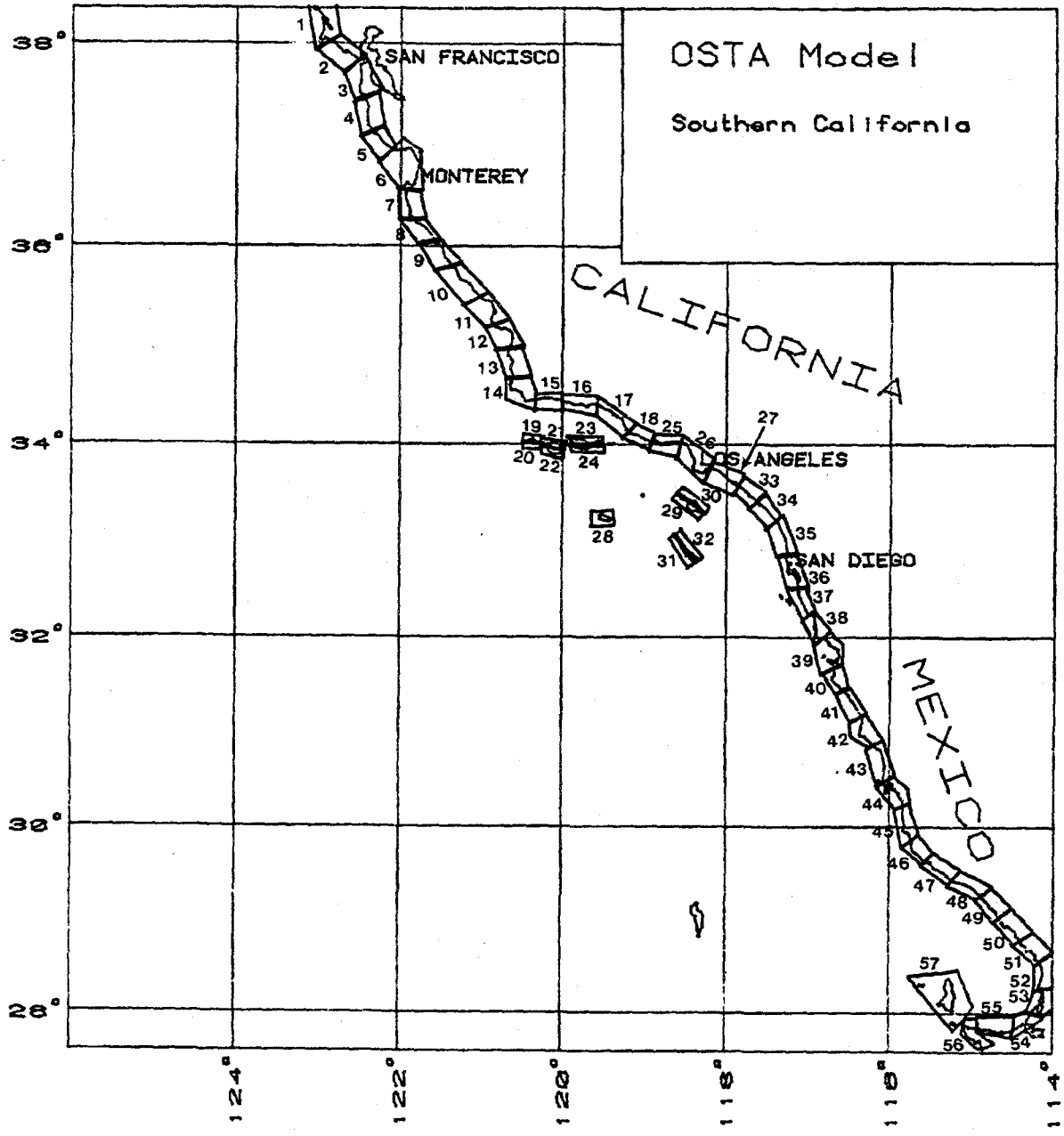

Figure 6. -- Map showing the division of the shoreline into 57 segments of approximately equal lengths.

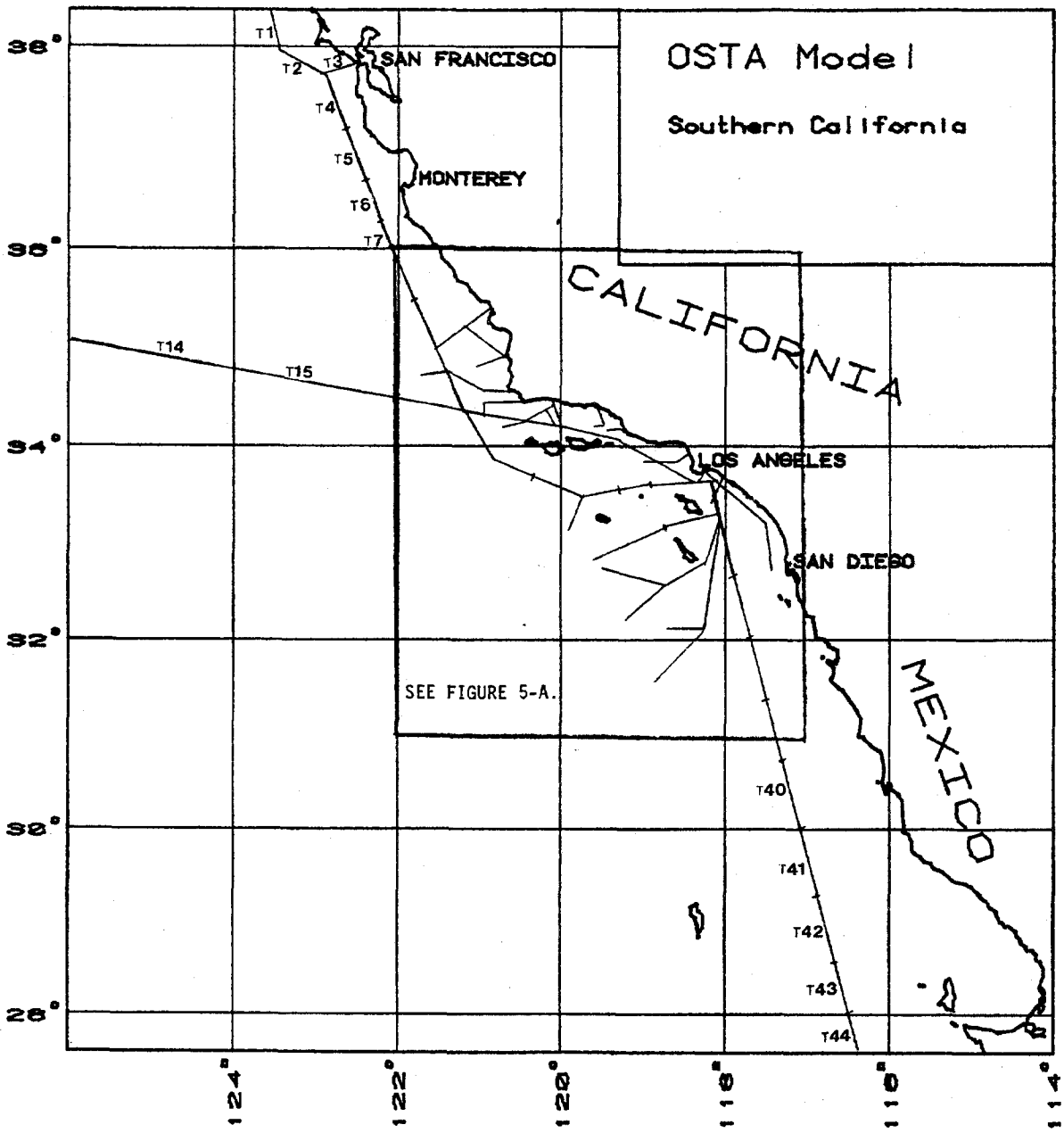

Figure 5. -- Map showing the transportation route segments; T1-T44 represent tanker routes, L1-L24 represent pipelines.