ENVIRONMENTAL REPORT

DEVELOPMENT • PRODUCTION

PLATFORM GILDA

AND SUBSEA PIPELINE

FOR

UNION OIL COMPANY OF CALIFORNIA

SANTA CLARA UNIT

OCS LEASES: P-0216

NOVEMBER 1979

ROBERT DUNDAS ASSOCIATES

Working with the Environment

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RDA

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RDA Project 562-79

PREFACE

This environmental report describes those activities proposed by Union Oil Company of California, for the development and production of crude oil and natural gas discoveries in OCS Lease P-0216 of the Santa Clara Unit, located in the Santa Barbara Channel off the coast of Southern California. This document has been prepared to satisfy requirements of the United States Department of the Interior, Geological Survey, as a single source document identifying the following:

a) All activities proposed for immediate implementation and those contemplated for future implementation;

b) All environmental and safety features required by law together with such additional measures as the lessee proposes to employ;

c) All information available to the lessee at the time of submittal to enable evaluation of the significant environmental consequences of the proposed activities.

In addition to these basic requirements, this document will provide:

1) Information to the State of California and the general public concerning the nearshore and onshore impacts of the proposed activity on Federal lands of the Outer Continental Shelf, and;

2) The necessary data and information to the State of California to enable the state to determine consistency concurrence or nonconcurrence.

In preparing this report for Union Oil Company of California, operator of Platform Gilda on OCS P-0216, Robert Dundas Associates have closely followed, "Guildlines for Environmental Report" (undated) issued by USGS on or about June 15, 1978. These guidelines finitely detail virtually all

aspects of OCS oil and gas operations promulgated by Congress, as an annotation of the Coastal Zone Management Act and the National Environmental Policy Act, Title 30 CFR 250.34-3 (b) (Federal Register, Vol. 43, No. 19, January 27, 1978). Subsequently, other responsible agencies and those agencies having jurisdiction by law at the federal, state and local levels have responded to the USGS mandate, tending to broadening the concept of a short, concise document defining all proposed activities by the lessee(s) and their resulting consequences.

In following the letter and spirit of the USGS guidelines, this environmental document addresses primarily those consequences which are "site-specific". Working within the guideline constraints, then, provides a series of factual statements to assist USGS in the preparation of an Environmental Statement, and to provide the affected State(s) with information relating to the nearshore and onshore impacts of the proposed OCS activity. Thus, the Environmental Report becomes a terse document of the environmental factors only when they are relevant and dependent upon the proposed action.

Throughout the report, references are made to studies in progress or recently completed. Certain of these studies will be available only upon request from Union Oil Company of California, as noted in the report.

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Platform "Gilda" and Subsea Pipeline

1.2 General OCS Areas:

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1.3 Block Number and Field:

OCS Lease P-0216, Santa Clara Unit

1.4 Operator:

Chevron, USA

Agent:

Union Oil Company of California

1.5 Platform Name:

"Gilda"

1.6 Date of Environmental Report Preparation:

November, 1979

1.7 Environmental Report Prepared By:

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Oxnard, California 93030
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1.8 Environmental Report Identification:

RDA Project 562-79

1.9 Related Environmental Reports or Environmental Statements:

E/R Hueneme Offshore Platform and Onshore Facility (Platform Gina), Union Oil Company. (1978)

E/R Pitas Point Platform and Subsea Pipeline, Texaco, Inc. (1979)

E/S Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf off California, US Geological Survey.

E/S OCS Sale No. 48, BLM. (1979)

SECTION 2

DESCRIPTION OF THE PROPOSED ACTION

2.1 Operator

Chevron USA is the operator of the Santa Clara Unit; however, Union Oil Company of California is the designated agent for any and all operations on OCS Lease P-0216.

2.2 Lease Number and Location

The lease upon which the proposed action will take place is OCS P-0216, formerly Tract 373 of the Santa Clara Unit, which is located in federal waters of the east Santa Barbara Channel. Figure 2-1 shows the location of the proposed site within the Santa Clara Unit, its proximity to the Hueneme Field and onshore location.

2.3 Date of Application Filing with the Conservation District.

Submitted to:

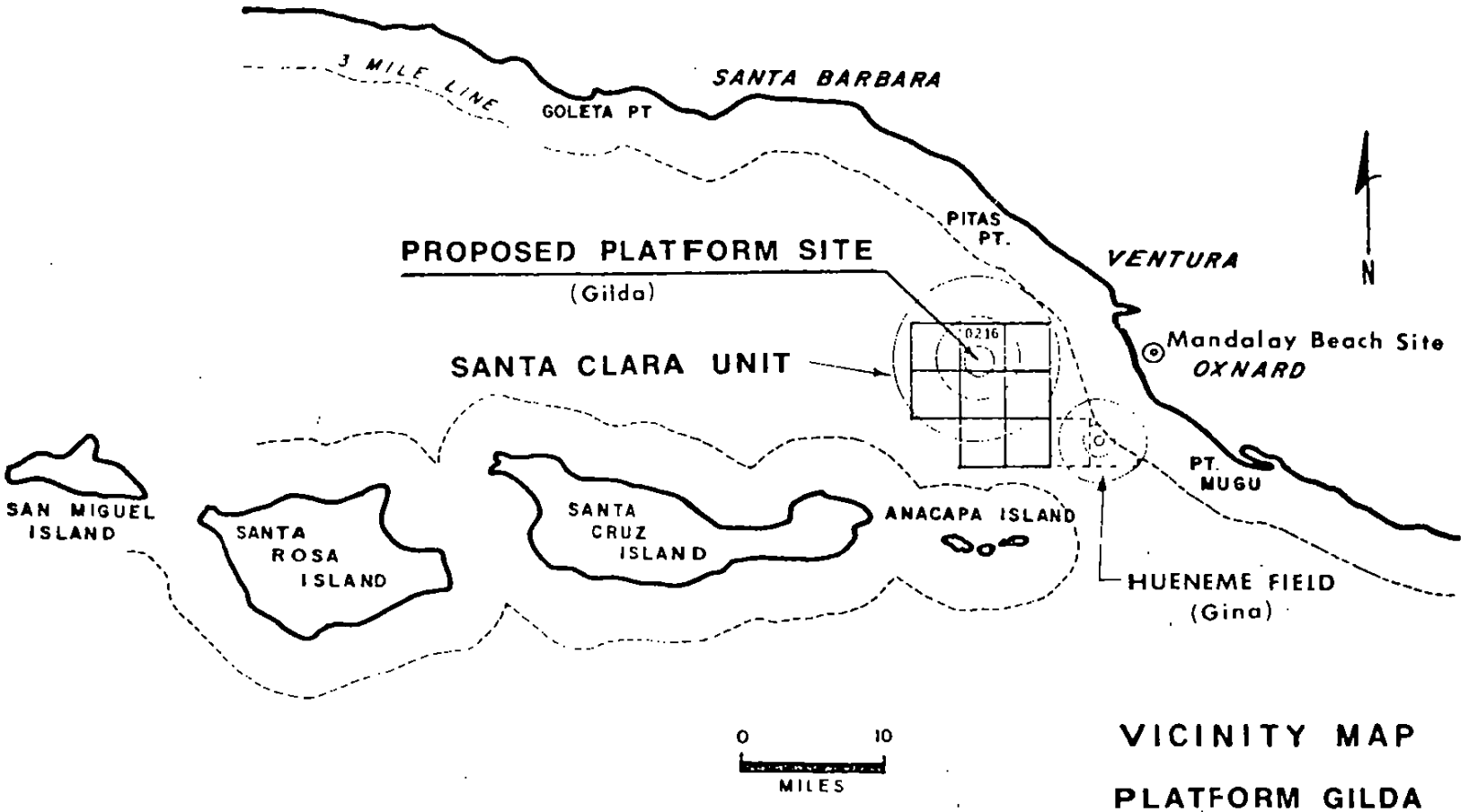
US DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PACIFIC AREA
NOVEMBER, 1979

2.4 Objectives of the Proposed Action

The objectives of the proposed action are twofold: to estimate quantities of natural gas and oil integral to the Monterey and Repetto formations; and to develop and produce these associated resources found in OCS Lease P-0216 of the Santa Clara Unit.

2.5 Platform Location and Description

The proposed platform will be located on OCS Lease P-0216 of the



VICINITY MAP

PLATFORM GILDA

RDA

Figure 2-1

Source: Dundas Associates

Santa Clara Unit in the east Santa Barbara Channel, at the intersection of California Lambert Coordinates: X = 1,041,760 and Y = 747,980.

The platform will be erected on federal lands, in 210 feet of water (MLLW), approximately 9.9 miles offshore, opposite the coastal communities of Oxnard and San Buenaventura.

The platform will be a twelve-pile steel structure anchored on the sea floor by pilings driven into the sea floor substratum through the tubular main supporting legs. The pilings will penetrate the substratum to a depth that will satisfy all safety requirements as set forth in API RP-2A (latest revision) and in conformance with the applicable standards of USGS. Design of the pilings will be based upon a site-specific, geotechnical investigation which has been made by Fugro, Inc.

The proposed platform will contain provisions for 90 well conductors, 60 of which will be allocated to the Repetto reservoirs, and 30 for development of the deeper Monterey reservoirs. The exact number of wells to be drilled is unknown at this time, due to uncertainties of the fracture system occurring principally in the Monterey formation. A more detailed evaluation of the Repetto and Monterey formations and their fracture systems is included under Section IV and in Appendix A of Union's Plan of Development.

The principal parts of the structure are the jacket, piling, and deck sections. Three deck levels will be provided: A drilling deck on which the drill rigs (2), cranes (2), crew's quarters, and heliport are located; a production deck for operating machinery, control room, switchgear, and safety equipment; and a sub-deck for holding wastes generated on the platform.

Principal dimensions of the drilling deck are approximately 155 feet long by 131 feet wide. Total height of the structure, including the drill rigs, is approximately 218 feet above MLLW. Side elevations of the structure and general arrangement plans for each of the decks are shown in Section 8 as Exhibits A, B, C, D, and E (Section 8).

2.5.1 Platform Equipment

The platform will be equipped with the following items, which are considered supportive to the drilling and production operations.

1. One electrically-driven fire water pump.
2. One diesel-driven fire water pump.
3. Two 70-ton-capacity cranes, with 100-foot booms:
   a) One on north side of drilling deck;
   b) One on south side of drilling deck.
4. One 2.5-ton crane on the production deck.
5. Deck drain collection and disposal system.
6. Potable water tank and pump.
7. Sewage disposal unit (similar to Microphor Marine Sanitation Device - uses bacterial action to reduce sewage to liquid and carbon dioxide).
8. Public address system.
9. Alarm system.
10. Navigational aid (fog horn and lights) as required by the U.S. Coast Guard.
11. Life-saving and flotation equipment.
12. First aid equipment (Company personnel will be qualified through Red Cross First Aid training).
13. Fire hose reels and fire monitors, as required.
14. Portable chemical fire extinguishers on the rig floor, on the drilling and production decks, and in enclosed areas.
15. Direct telephone communications.
16. Radio communications.
17. Hydrocarbon gas detectors.
18. H_2S detectors.
19. Flame detectors.
20. Utility air system.
21. Instrument air system, including air dryer.
22. Fire water deluge system in all well rooms and other critical locations on the production deck.

2.5.2 Platform Waste Removal

Any platform wastes that might be considered as being harmful to the environment will not be disposed of into the ocean. Accidental spillage of small quantities of debris, liquid, and gaseous wastes are difficult to assess and quantify. Therefore, wastes and their control are directed toward a conscientious program to prevent accidental release to the environment. Platform wastes can be classified within three categories: a) Liquids; b) Solids; and c) Gaseous pollutants. Each of these categories of waste can be characterized as to those which are degradable and those which are nondegradable. In most instances, each classification of waste will require containment and final disposal consistent with OCS Order No. 7, in addition to other federal, state, and local regulations which may affect their disposal onshore.

a) Liquid Waste. All liquid waste, such as sewage, oilfield brine, washed drill cuttings and non-toxic drilling muds, will be treated and discharged under NPDES permits issued by the EPA. Sewage effluent discharge will contain less than 50 PPM of suspended solids, and a minimum of one PPM of chlorine residual. Produced water, collected rainwater, and wash water will be treated so that the oil (or grease) content will not exceed 50 PPM. Sampling, monitoring, and reporting of this effluent discharge will be in accordance with OCS Order No. 8, pp. 7-8. Spent drilling muds and cuttings (non-toxic) will be discharged into the ocean. Other waste, such as spent lubricating oils, oil slops, solvents, or otherwise environmentally toxic liquids, will be held on the platform in suitable containers for transfer to support boats, for appropriate disposal onshore (Pitas Point E/R, 1979, Ref. 12).

b) Solid Waste. Paper, metal, plastic, wood, rubber, glass, and composition products are typical of solid waste accumulations from platform operations. While most of these wastes are, for practical purposes, considered non-toxic, some are a potential fire hazard. All are aesthetically offensive. All solid waste will be collected in suitable containers for

disposal onshore. Those solid wastes having recycle value will be appropriately separated for salvage.

c) Gaseous Waste. These wastes primarily relate to emissions from internal combustion engines and fired heaters, a subject which is covered in the Air Quality Section of this report. Since drilling muds are used to seal the bore hole, the only other accountable source for hydrocarbons entering the atmosphere is the screening operation to remove cuttings from the circulating drill muds. In this operation, a small amount of emulsified gas in the mud is released. The amount of gas released, however, is minimal, and will not adversely affect the National Ambient Air Quality Standards. Prudent "Marine Safety Practices" virtually eliminate sources of leaks from flanges, fuel transfer points, and seals of valves and rotating machinery, so that fugitive emissions are negligible (Pitas Point E/R, 1979, Ref. 12).

2.5.3 Safety Systems

Safety systems are broadly classified as those devices and practices which safeguard life and limb, the environment, resources, and equipment. Specifically, they relate to good design practice, personnel training, and operational emergency modes. In design, construction, and operation of the proposed platform and subsea pipeline, all applicable standards promulgated by USGS NTL-OCS Orders, US Coast Guard (USCG), OSHA, NEPA, CZMA, California and National Electrical Codes, and the recommended design practices of the American Petroleum Institute (API) will be followed. All decks on the platform will have curbs and gutters to prevent accidental spillage of liquid or solid wastes into the ocean. To prevent overpressuring the gas collection system, balanced relief valves and an emergency flare stack will be provided.

2.5.4 Well Monitoring System

During the drilling of a well, subsurface pressure, if not controlled, could result in a blowout. To assure early detection, and thereby early reaction, to an impending blowout, Union will continuously monitor well conditions. Well pressures are normally controlled by adjusting the

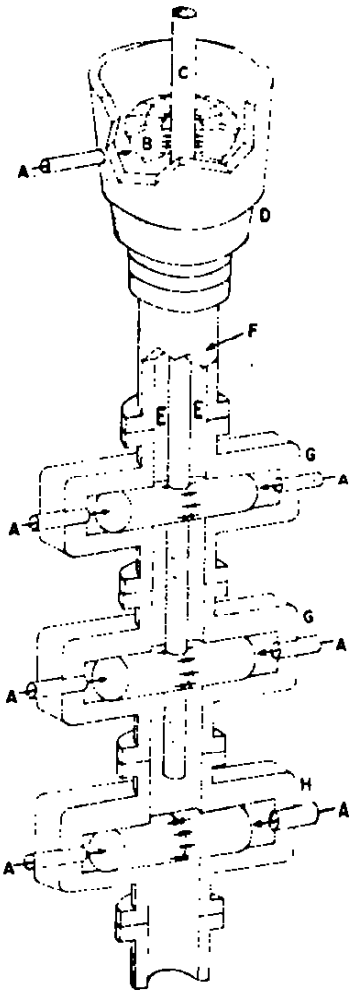
density of drilling muds. Blowout prevention equipment will be installed and tested regularly to ensure that any surface pressure can be contained. The blowout preventer consists of giant hydraulic control valves, in series, which close about the drill pipe, casing, or other devices used in the drilling operation. It will also seal-off the open hole. A simplified illustration of the blowout preventer is shown in Figure 2-2.

The blowout preventer hydraulic system is equipped with an accumulator having sufficient capacity for two full operations of the blowout preventer in the event of an electrical failure, and a redundant high pressure nitrogen back-up system. Operation of the blowout preventer is automatic, but has the added feature of manual initiation should it be required. Other equipment will include local and remote blowout preventer control stations, drilling spool, a kill line with master valve, a choke manifold with adjustable chokes, master valve and hydraulic control valve, kelly cocks, and an inside blowout preventer. This equipment fulfills all requirements of the USGS OCS Order No. 2, "Blowout Prevention Requirements".

Union has a very detailed and comprehensive contingency plan which will be submitted to USGS with the Plan of Development and this E/R as a separate document. The contingency plan specifically outlines the immediate and post-spill procedures to be followed, notifications to all appropriate and concerned governmental agencies, and the deployment of personnel and equipment.

The following minimum-spill containment equipment will be stored on the platform for immediate use by trained platform personnel:

a) 1,000 feet of Kempner 8" Sea Curtain oil containment boom.
b) One Acme 51 T oil skimmer.
c) Ten drums of Corexit #9527 oil dispersant.
d) Three boxes of Conwed sorbent booms.
e) Three boxes of Conwed sweeps.
f) Such other equipment as required by the USGS area supervisor.



Typical Blowout

Preventer

Figure 2-2

Source: Composite, Dundas Associates

If, in the opinion of the Union foreman, equipment at the site is inadequate to contain and clean up a spill, he will request the necessary equipment and material from the closest available industry clean-up organization. Union is a participating member of Clean Seas, Inc. (CSI), Santa Barbara, California, a non-profit corporation funded by the oil industry. CSI maintains spill-containment equipment at several strategic onshore locations in the Santa Barbara Channel area to effect quick action response. Upon request by the USCG, CSI will respond to any and all spills that may occur within its area of operations. Union also has a mutual assistance agreement with other oil operators in the Channel. Thus, additional equipment and manpower can be marshalled at the site in a minimum time of less than one hour for any spill in excess of 50 barrels.

CSI routinely deploys eight vans, which are strategically located in proximity to the general Channel coast. Their locations are: Carpinteria (CSI's main equipment depot), Gaviota, Avila, Santa Barbara, Point Dume, Morro Bay, and in the vicinity of Port Hueneme. See Exhibit F for the location and a list of equipment contained in each van. Being mobile units, these vans can be transported by land or on the decks of supply boats to virtually any location. Other equipment which is available for quick deployment is housed at CSI's facility at Carpinteria, and is catalogued in Union's Contingency Plan.

CSI regularly conducts boom-deployment training drills at each of the coastal wetland sites, estuaries, and harbors within the Channel area. Thus, CSI remains in a state of preparedness and has the capability of responding to virtually any spill within a four-hour period.

2.6 Description and Location of Onshore Facility

Platform Gilda will use the same onshore facility proposed for Union's Platform Gina. This facility will be located immediately south and adjacent to Southern California Edison Company's Mandalay Steam Station. The site occupies approximately 1.8 acres, with approximately 250 feet of ocean frontage. The block in which the proposed lease parcel is located is

shown in the Ventura County Assessor's map book, 183-P.01, as part of Block 146. Exhibit G is the lease parcel of the proposed site, on which the parcel dimensions and California Lambert Coordinates are shown.

The property adjacent to the southern perimeter of the proposed onshore facility is the future site of Mandalay Beach Park, a project of the Ventura County Department of Parks and Recreation. Access to the proposed facility will be via an easement from either Harbor Boulevard on the east, or West Fifth Street on the south. Thus, public access to the park area will be provided where none now exists.

The Union facility will be enclosed by a ten-foot-high block wall, along the south and west park boundaries, and a chain-link fence along the northern and eastern boundaries.

Union proposes minimum disruption of the existing sand dune system at the proposed site. Sand displaced by foundations and leveling of the onshore site will be used to re-establish that part of the existing dune immediately west of the site, which has been diminished from use of off-road recreational vehicles.

Union has requested temporary use of approximately four additional acres of the proposed park along the northern boundary for the construction of the offshore pipeline. During construction, Union will exercise caution in protecting native flora and the existing sand dunes. Upon completion of its work, Union will restore the site to its original contour, and replant disturbed and displaced vegetation.

The onshore facility, as originally proposed for the Hueneme Field platform (Gina), occupied 1.5 acres. Union proposes enlarging this site to 1.8 acres, to handle the additional production from Gilda. A comparative evaluation of this site, with an alternate site on the northern perimeter of the Mandalay Steam Station, reveals that enlargement of the originally-proposed site will easily conform within the existing flat area behind the sand dunes on the north and west sides of the chosen site.

The equipment to be installed will include two additional heater-treaters, additional capacity for gas handling and treating, and pumping capacity to accommodate the projected production. All equipment will be designed to present a low profile and will utilize Best Available Control Technology (BACT) for air pollution control. Figure 2-3 is a plot plan for the proposed expanded site.

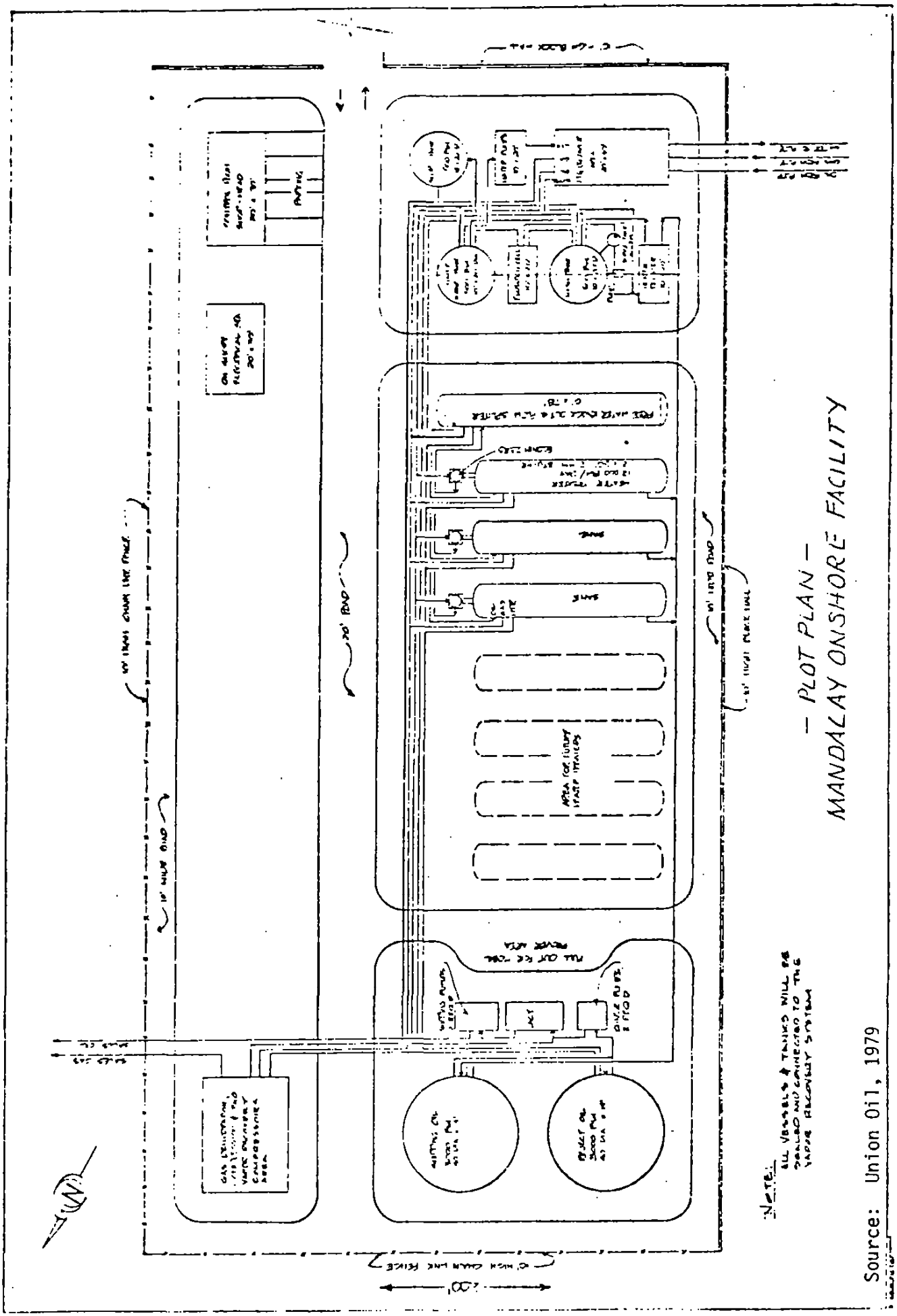
Since the viscosity of the oil and water emulsion from Gilda will vary from that of Gina, it will be necessary to transport oil from the two platforms in individual pipelines at different pressures. The effluent from Gina and Gilda will arrive at separate onshore pig receivers, after which it will pass through multiphase separators, where the entrained natural gas will be separated, free water decanted, and the remaining oil and water emulsion introduced to the economizer section of the heater-treaters. The remaining water will be disassociated in the heater-treaters, after which the oil will be transferred to the shipping surge tank, the Lease Automatic Custody Transfer (LACT) unit, and then discharged into the existing coastal transmission line after metering.

Extraction water will be collected in a wash tank, where entrained oil will be recirculated to the main heater-treater bank or further treated in a separately-fired small (1MM BT/hour) heater-treater. Treated water will be returned to either platform for well injection.

Gas from the onshore separators, pressure vessels, and tanks will be collected, compressed to the transmission line pressure, dehydrated to dewpoint specification, and delivered directly into the existing coastal sales gas transmission line.

Discussion of Fuel Conservation Measures

As fuel costs increase, it becomes economically feasible to install equipment and systems to effect better utilization of fuel resources. Union has undertaken an investigative study for waste-heat recovery and



Source: Union Oil, 1979

Figure 2-3

other methods to reduce fuel consumption. This study has revealed the practicality of recovering vented gases from process equipment and, significantly, the application of economizers in recovering waste heat from the heater-treaters.

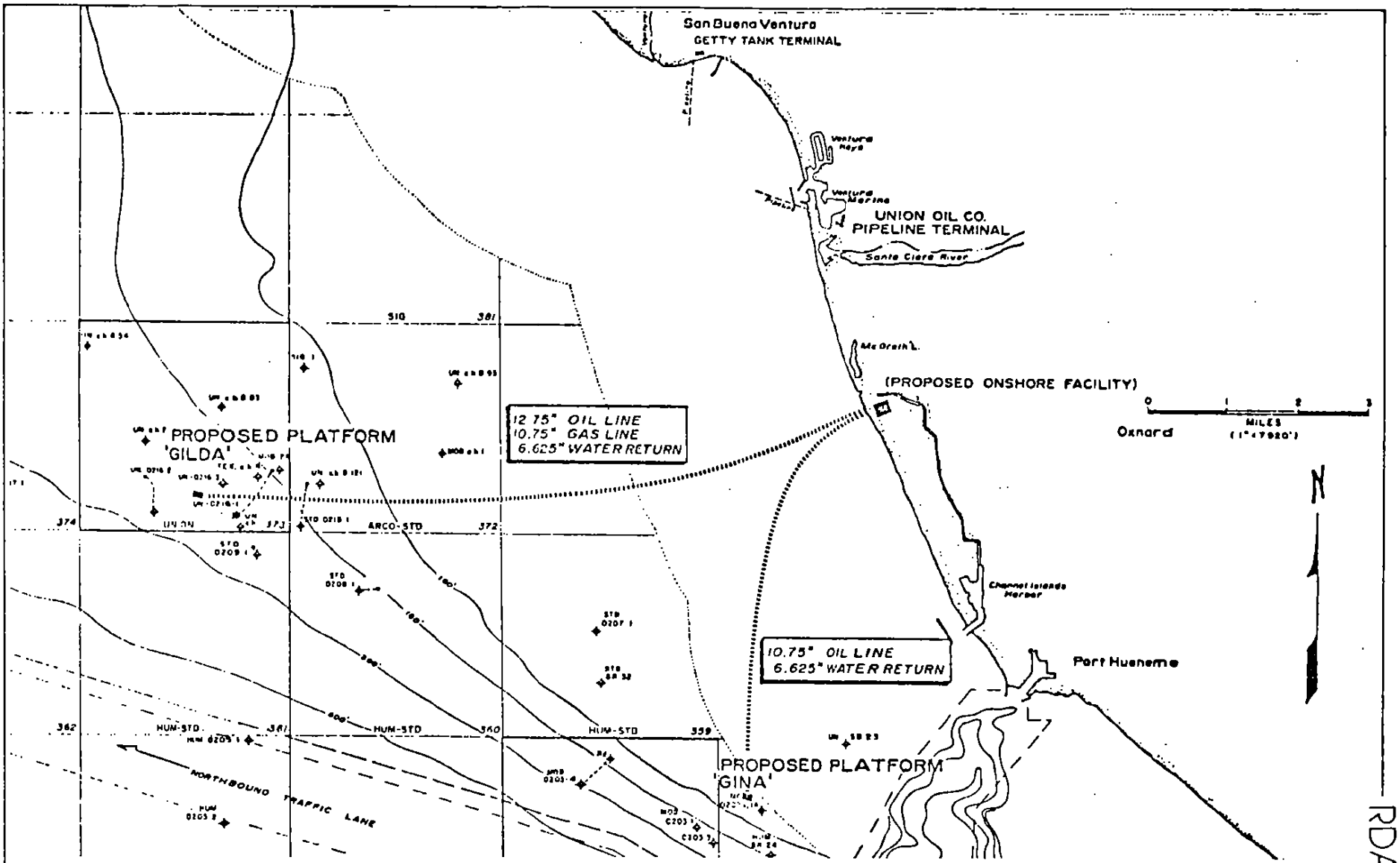
As a fuel conservation measure, Union will use economizers to recover waste heat from the flue gases of its heater-treaters. While the concept of using an economizer to recover waste heat in power boilers is widely practiced, currently escalating fuel costs offer economic justification to applying economizers to new heater-treater installations as a part of the system process. In the power industry, similar applications to boiler units have demonstrated that, for each 41 degrees F. reduction in boiler-effluent gas temperature, a gain of one percent in thermal efficiency is realized.

Heater-treaters will generally have exhaust gas temperatures in the range of 800 degrees F. By using an economizer, this temperature can realistically be reduced to approximately 250 degrees F., thereby recovering 550 degrees F. of heat from the exhaust gas system. Using the analogy of the power industry, this represents a thermal gain of 13.4 percent. However, losses due to radiated heat and mass transfer will conservatively reduce this gain by 1.4 percent. Thus, the net thermal gain will be in the neighborhood of 12 percent.

Other conservation measures include the recovery of gases previously vented to the atmosphere from process components. These gases are compressed and introduced into the treated-gas pipeline. Any liquids (resulting from compression) are returned to the processed-oil pipeline.

2.7 Description of Transport Pipelines

Three parallel pipelines are proposed between Platform Gilda and the Mandalay Beach onshore processing facility. The pipeline route, which is approximately 9.9 miles long, is shown in Figure 2-4. Produced gas will be transported onshore through a 10.75-inch diameter by 0.50-inch wall pipeline at a working pressure of 2,160 psig. A second pipeline, 12.75-inch



PROPOSED PIPELINE ROUTE

Source: Union Oil, 1979

Figure 2-4

diameter with an 0.500-inch wall thickness, would be used to transport the produced oil and water mixture onshore at a working pressure of 2,160 psig. A third line, 6.625-inch diameter with an 0.280-inch wall thickness, would return the produced water (separated at the onshore facility) to the platform for reinjection into the formation. Reinjection of produced water will assist in maintaining reservoir pressures and maximizing hydrocarbon recoveries.

Gas produced from the Repetto and Monterey formations would be collected from each wellhead annulus and platform gas separators in the platform gas-gathering system. The gas would be compressed to the transport pipeline pressure and desiccated by refrigeration to remove moisture before delivery to the subsea transport pipeline. Gas produced from the Repetto formation is expected to peak at approximately ten MMCFD. Based upon preliminary information of the deeper Monterey formation, if there were proven commercially recoverable reserves, an anticipated peak of nine MMCFD could be produced. Gas produced in both formations would be transported in the same pipeline.

The oil and water mixtures produced from the Repetto and Monterey formations would flow from the wellheads into a manifold system to a gas separator. After removing the entrained gas, the oil/water emulsion would be pumped to the onshore facility for separation of oil and produced water. At the peak period of production, it is estimated that the Repetto formation will yield approximately 20,000 BOPD. Based upon preliminary information, the Monterey formation could produce as much as 7,000 BOPD. Fluids produced from both formations would be transported onshore through the same pipeline.

Section XI of the Plan of Development, "Pipeline System", describes: gas and fluid measurement to the transport pipelines, safety and pollution control devices, and placement of the subsea pipeline system. Near shore, the pipeline systems from both Gilda and Gina would enter the same corridor leading to the Mandalay Beach onshore processing facility. The transport

pipeline system of Platform Gina is discussed in the Hueneme Offshore Platform E/R (Dundas Associates, 1978, Ref. 13).

2.8 Compliance with OCS Orders

Union warrants that the action proposed and described in its Plan of Development, its Contingency Plan, and this Environmental Report, will comply with the OCS Orders and Notices to Lessees for the Pacific Region, United States Department of the Interior, Geological Survey.

2.9 Time Frame for Operations

The time frame for operations is shown in Figure 2-5, "Activity Schedule". The tasks shown include the sequence of activities for both Platform Gina and Platform Gilda. Total estimated time to complete both projects, from decision to proceed to commencement of drilling operations, is approximately 16 months. Union will extend every reasonable effort to better this schedule in order to begin production at the earliest possible time.

2.10 Nearby Pending Actions

Nearby pending actions are:

a) Proposed 12-inch pipeline and 10-inch pipeline (Chevron) bringing production from Platform Grace to Platform Hope and thence through existing pipelines to Chevron's existing onshore facility at Carpinteria. Status: filed for approvals; final EIR/EA completed, onsite construction currently in progress.

b) Pitas Point Unit Platform (Texaco, Inc.), OCS Leases P-0233, P-0234, and P-0346. Plan of Development and E/R submitted to USGS.

c) Platform Henry (Sun Oil Company).

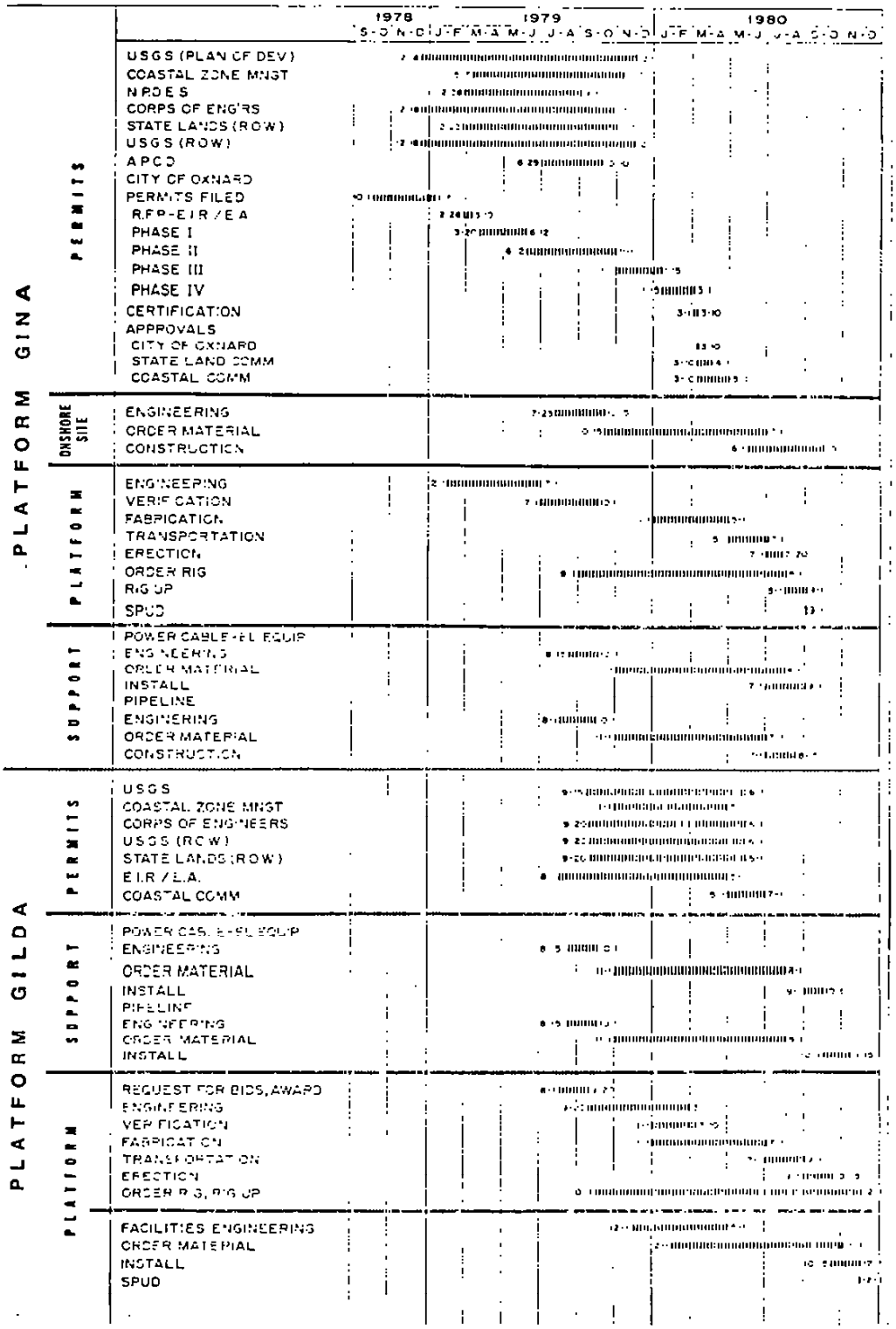
2.11 Application of Best Available Technology

The best available technological aspects of this project are:

a) Separate onshore processing facility and injection water return.

ACTIVITY SCHEDULE

SANTA CLARA-HUENEME DEVELOPMENT



Source: Union Oil, 1979

Figure 2-5

b) Application of heat recovery system for heater-treaters.

2.12 Travel

During the construction, development, and production phases of Platform Gilda, all crew boats, supply boats, and support vessels will use Port Hueneme as a port of operations. Aircraft (helicopter) would be expected to use the Oxnard Airport.

2.12.1 Travel Routes

It is assumed that both boats and aircraft will use the shortest route (point-to-point) consistent with USCG-recommended practices and FAA requirements. Approximate route distances to Platform Gilda are:

1) Port Hueneme to the platform site - 12.5 statute miles.

2) Oxnard Airport to the platform site - 12 statute miles.

2.12.2 Frequency of Travel

a) Construction Phase

Crew Boats - Daily (depart/arrive: Port Hueneme)
Supply Boats - Three times weekly (depart/arrive: Port Hueneme)

b) Drilling Phase

Crew Boats - Daily (depart/arrive: Port Hueneme)
Supply Boats - Three times weekly (depart/arrive: Port Hueneme)
Aircraft - Two times weekly (depart/arrive: Oxnard Airport)

c) Production Phase

Crew Boats - Daily (depart/arrive: Port Hueneme)
Aircraft - Infrequent (depart/arrive: Oxnard Airport)

2.12.3 Onshore Terminals

Project materials will be shipped by rail, sea, and motor transport,

depending on their size, weight, and geographical origin, to marshalling areas having convenient access to Port Hueneme. Project materials and equipment received at storage facilities would be truck-transported on an as-needed basis for ship or barge loading at Port Hueneme. Equipment and materials for the onshore treatment facility would be truck-transported to the proposed onshore site.

2.13 Energy Requirements

Energy sources required over the life of the project will be: diesel fuel, natural gas, and electricity.

2.13.1 Diesel Fuel

During the construction phase, energy requirements will primarily include use of diesel fuel for offshore transportation of personnel, supplies and construction equipment. During the drilling phase, diesel fuel will be used for crew boat operations, platform cranes, and supply boat operations. An order-of-magnitude estimate of diesel fuel consumption during the construction and drilling phases of Platform Gilda is 200,000 gallons for the period from September, 1980 to December, 1984. Thereafter, the diesel fuel requirement will be approximately 30,000 gallons per year.

2.13.2 Natural Gas

Natural gas will be used at the onshore processing facility to separate produced oil/water and associated gas from the combined production of Platform Gina and Platform Gilda. The source for this energy resource will be from the associated natural gas produced on both platforms. Estimated consumption of this resource while operating at peak production levels will be approximately 280 MMCF per year.

2.13.3 Electrical Power

During the drilling and production phases of Platform Gilda, electrical power will be used for all platform operations except for occasional use of cranes, emergency fire pumps, and the standby generator set. The

source of electrical power will be from a submarine cable placed parallel with the transport pipeline system. Transmission voltage will be 16.5 KV. Maximum project power demand during the drilling phase will be approximately 5,000 KVA, which, during the operating phase, will be reduced to less than 2,000 KVA. Power requirement of the onshore facility will be approximately 500 KVA during the life of the project.

2.14 Impact Monitoring Systems

2.14.1 Waste Water and Sewage

Sewage will be discharged at the platform under NPDES permit . Waste water will be treated and injected with the produced water.

2.14.2 Mud Monitoring and Control

Mud Logging Equipment. Union will continuously monitor the mud system, recording mud properties, the presence of oil or gas in the mud system, and the lithologic properties of the formations. Other information, such as the drilling rate, circulating mud pump pressure, and weight of the drill bit, will be recorded. Mud logging will be in accordance with OCS Order No. 2. Mud control will also include a pit volume indicator to indicate total volume of drilling fluid in the system, and a calibrated fill-up tank.

2.14.3 Transport Pipeline Monitoring

The transport pipeline system would be continuously monitored for flow and pressure. Thus, loss of pipeline integrity would reflect in fail-safe-condition of all production systems.

2.15 Personnel Requirements

Figures 2-6, 2-7, 2-8, and 2-9 delineate the estimated project work force requirements by task, time schedule, craft (or skill), number of persons required, and duration of employment:

Figure 2-6: Offshore Construction (Gilda)

Figure 2-7: Offshore Drilling and Production (Gilda)
Figure 2-8: Pipeline Construction (Gilda)
Figure 2-9: Onshore Facility Construction (Gina and Gilda)

Personnel having crafts (or skills) will be obtained from local labor sources. Professional personnel will be utilized from Union's staff or contracted for locally.

Union has a fully staffed Regional Office in Los Angeles and a District Operating Office in Ventura. Existing supervisory personnel of these offices will be used. It is estimated that five additional personnel will be recruited for full-time employment with this project. Thus, five families will be added to the Ventura County area.

2.16 Demand for Supplies

2.16.1 Major Supplies

Major consumable supplies required during the construction and drilling phases of the project are estimated to average:

Diesel Fuel	30 barrels per day
Lubricating Oils	1 barrel per day
Cement	4,400 cubic feet per well
Mud Materials	10,000 cubic feet per well
Drilling Bits	20 per well
Commissary Supplies	900 pounds per day

All of these supplies are available within the Port Hueneme area.

2.16.2 Potable Water

The potable water source is the Calleguas Municipal Water District (through the Oxnard Harbor District).

1) Construction - approximately 600 to 700 barrels per day.
2) Drilling and Operation - approximately eight to ten barrels per day.

562-79

FIGURE 2-6

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
OFFSHORE CONSTRUCTION

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
Platform Erection & Rig-Up	Sept., 1980 to Oct., 1980	Laborers	20	2	7 Weeks
		Crane Operators	2	2	
		Supervisors	2	2	
		Welders	12	2	
		Electricians	12	2	
		Engineers	2	2	
Production Deck & Support Systems	Oct., 1980 to Dec., 1980	Welders and Fitters	12	2	7 Weeks
		Laborers	20	2	
		Electricians	12	2	
		Supervisors	2	2	
		Engineers	2	2	

Platform crews to be changed-out weekly.

Source: Dundas Associates, 1979

RDA

FIGURE 2-7

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
OFFSHORE DRILLING & PRODUCTION SCHEDULE

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
Drilling & Production	Dec., 1980 to Dec., 1984	Drilling Crews	12	3	48 Months
		Crane Operators	2	3	
		Welders	2	3	
		Foreman	1		
Start-Up Production	Feb., 1981 to Feb., 1985	Operating Crew	2	3	48 Months
In Production	After Feb., 1982	Production Personnel	2	3	Continuous
		Foreman	1		
Well Workover	After July, 1982	Miscellaneous	15		As Needed

Source: Dundas Associates, 1979

FIGURE 2-8

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
PIPELINE CONSTRUCTION

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
Pipeline Construction	Oct., 1980	Welders	12	2	7 Weeks
	to	X-Ray Technicians	2	2	
	Nov., 1980	Laborers	24	2	
		Supervisors	2	2	
		Engineers	2	2	
		Divers	2	2	

Source: Dundas Associates, 1979

FIGURE 2-9

PROPOSED PROJECT WORK FORCE
COMBINED PLATFORMS GINA AND GILDA
ONSHORE FACILITY CONSTRUCTION

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
Site Preparation; Construct Fence; & Equipment Foundations	July, 1980 to Aug., 1980	Laborers	10	1	10 Weeks
		Carpenters & Helpers	10	1	10 Weeks
		Operational Engineers	5	1	3 Weeks
		Road Repair Gang	10	1	2 Weeks
Equipment Installation	Aug., 1980 thru Oct., 1980	Welders & Fitters	12	1	12 Weeks
		Electricians	6	1	10 Weeks
		Operational Engineers	2	1	5 Weeks
		Millwrights	2	1	2 Weeks
		Laborers	6	1	12 Weeks
		Painters	6	1	4 Weeks
		Landscapers	10	1	4 Weeks

Not included: Supervision, Professional Engineers, Architects, and Draftsmen.

Source: Dundas Associates, 1979

2.16.3 Other Goods and Services

Other goods and services, such as miscellaneous pipe, valves, fittings, electrical supplies, repairs to equipment, water treatment chemicals, etc., are obtainable from existing local stocks.

2.17 Responsible Person

The person to contact at Union regarding inquiries is:

Mr. Richard Gillen, Regional Production Engineer
Union Oil Company of California
2323 Knoll Drive
Ventura, California 93003
Telephone: (805) 659-0130

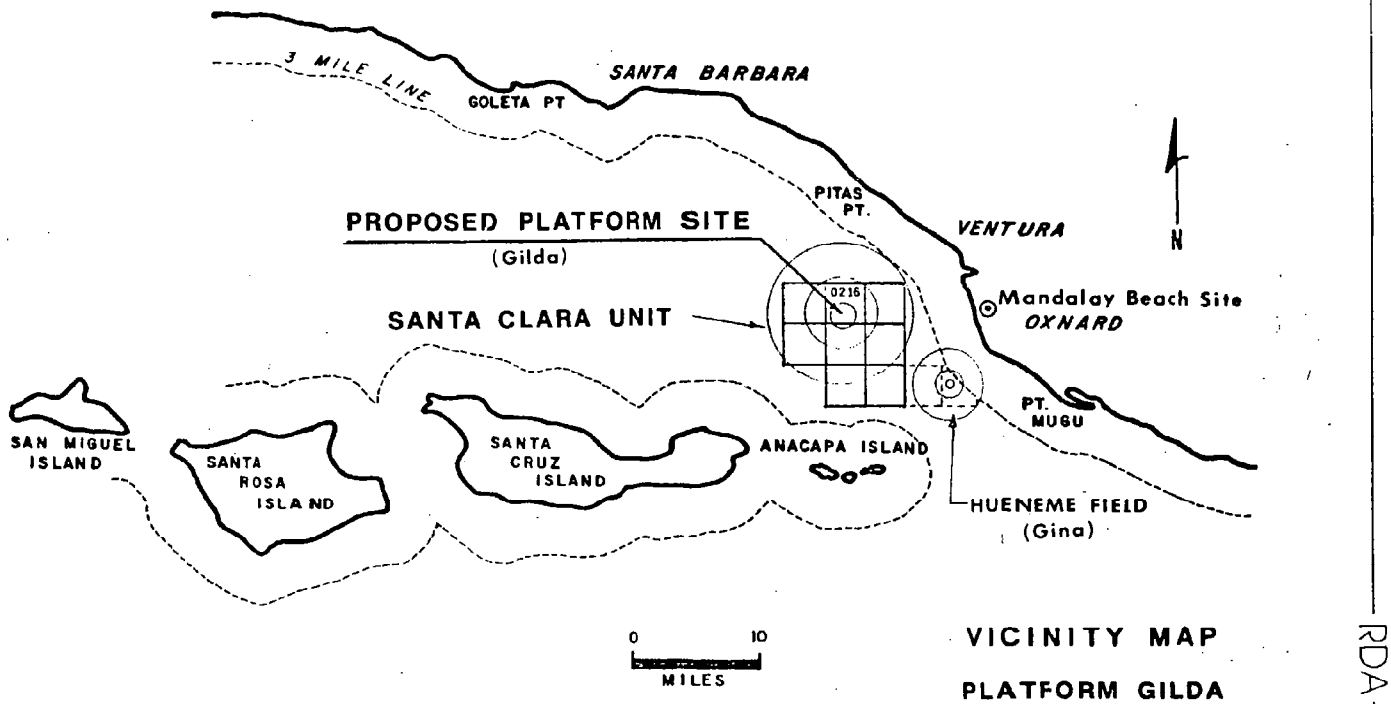
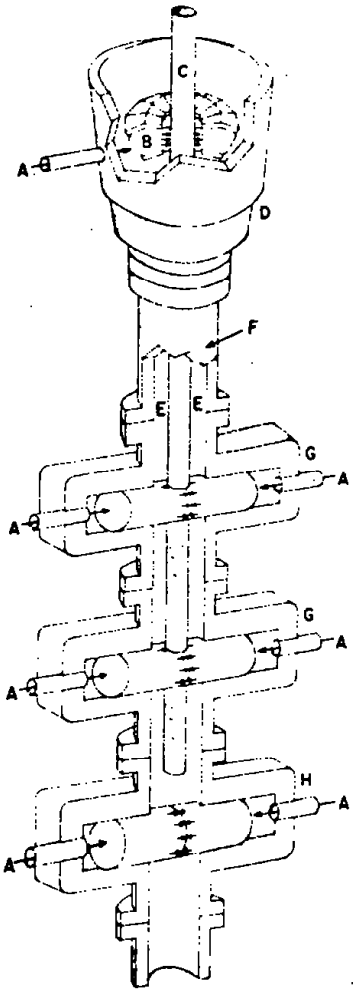


Figure 2-1

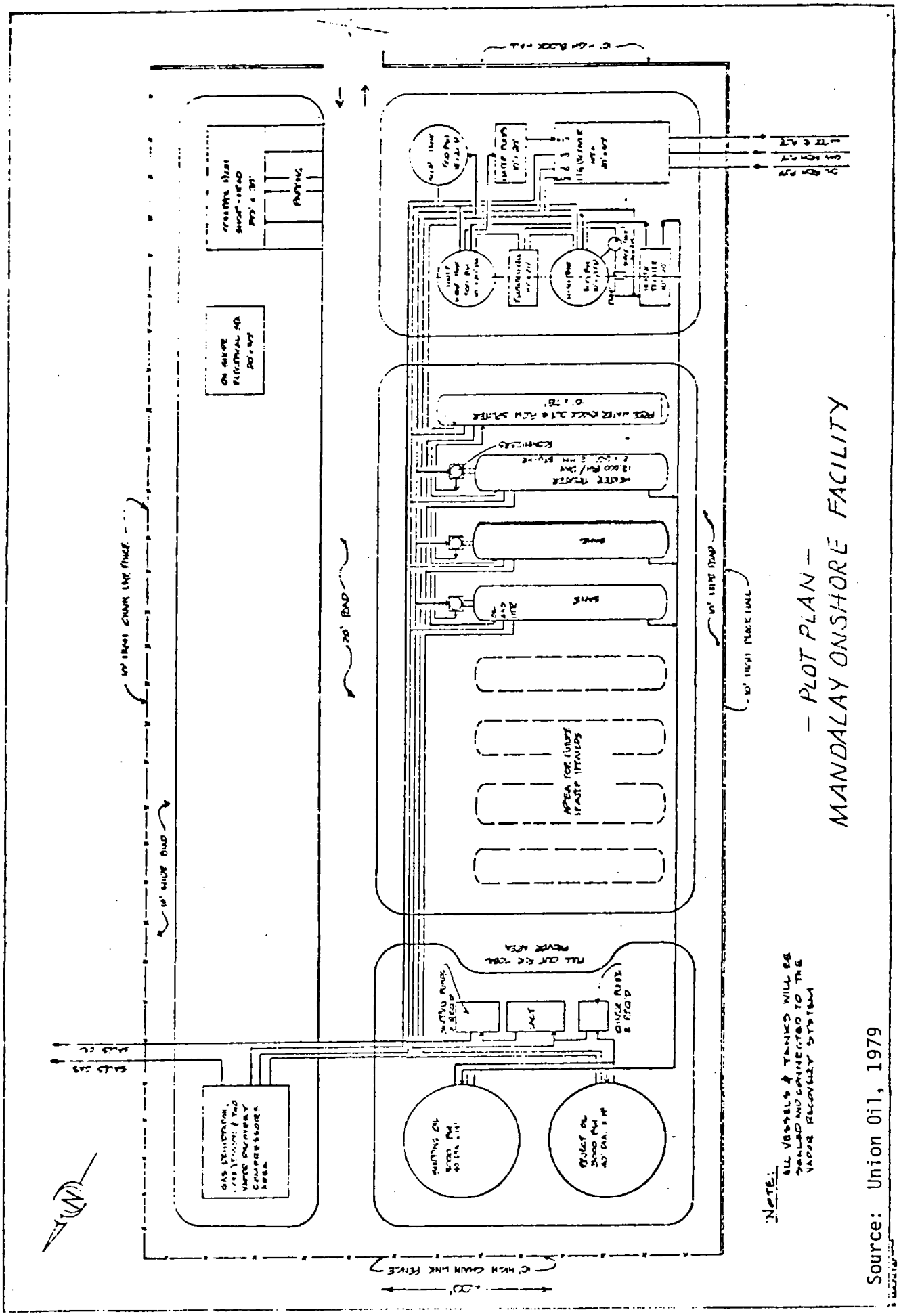
Source: Dundas Associates



Typical Blowout Preventer

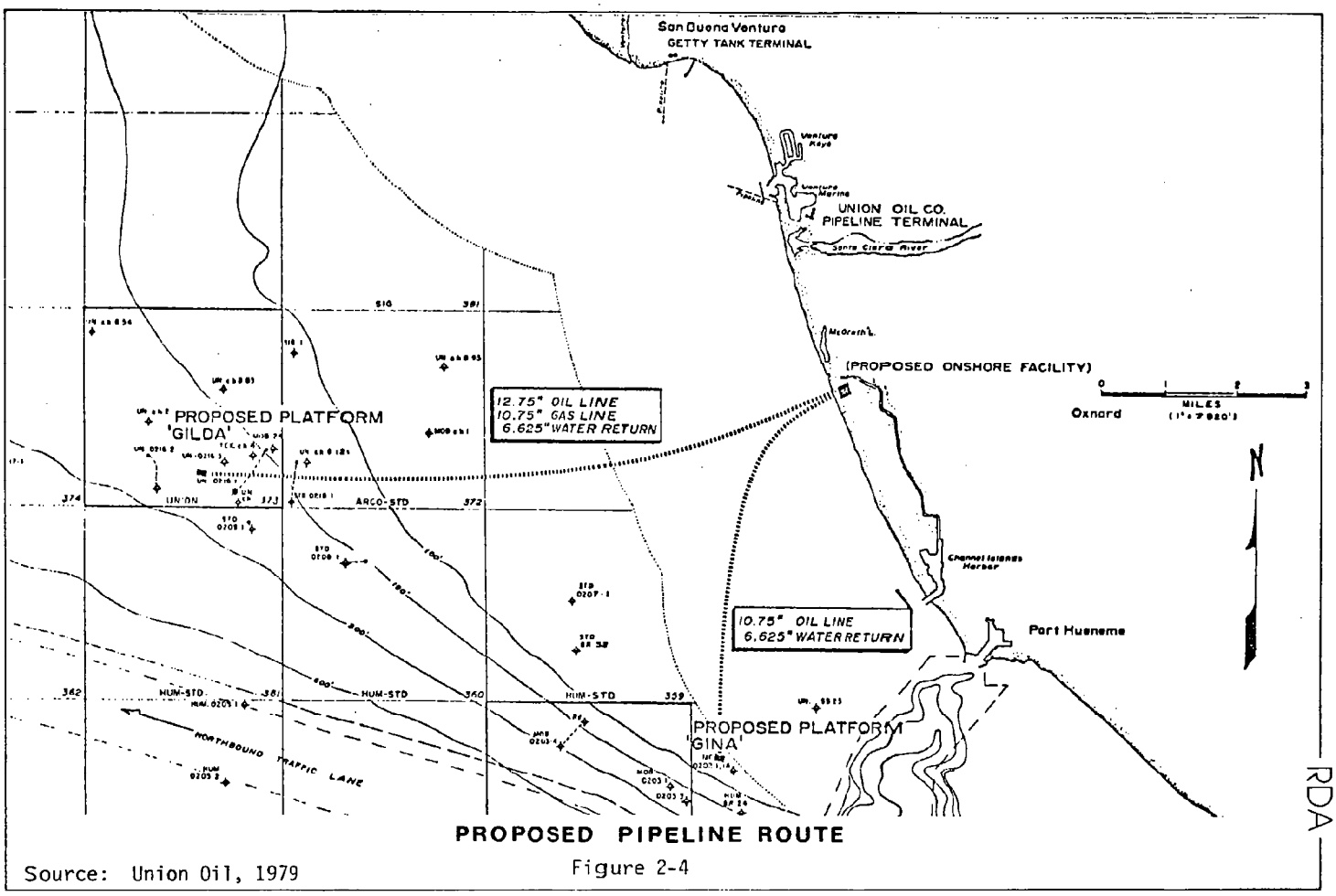
Figure 2-2

Source: Composite, Dundas Associates



Source: Union Oil, 1979

Figure 2-3



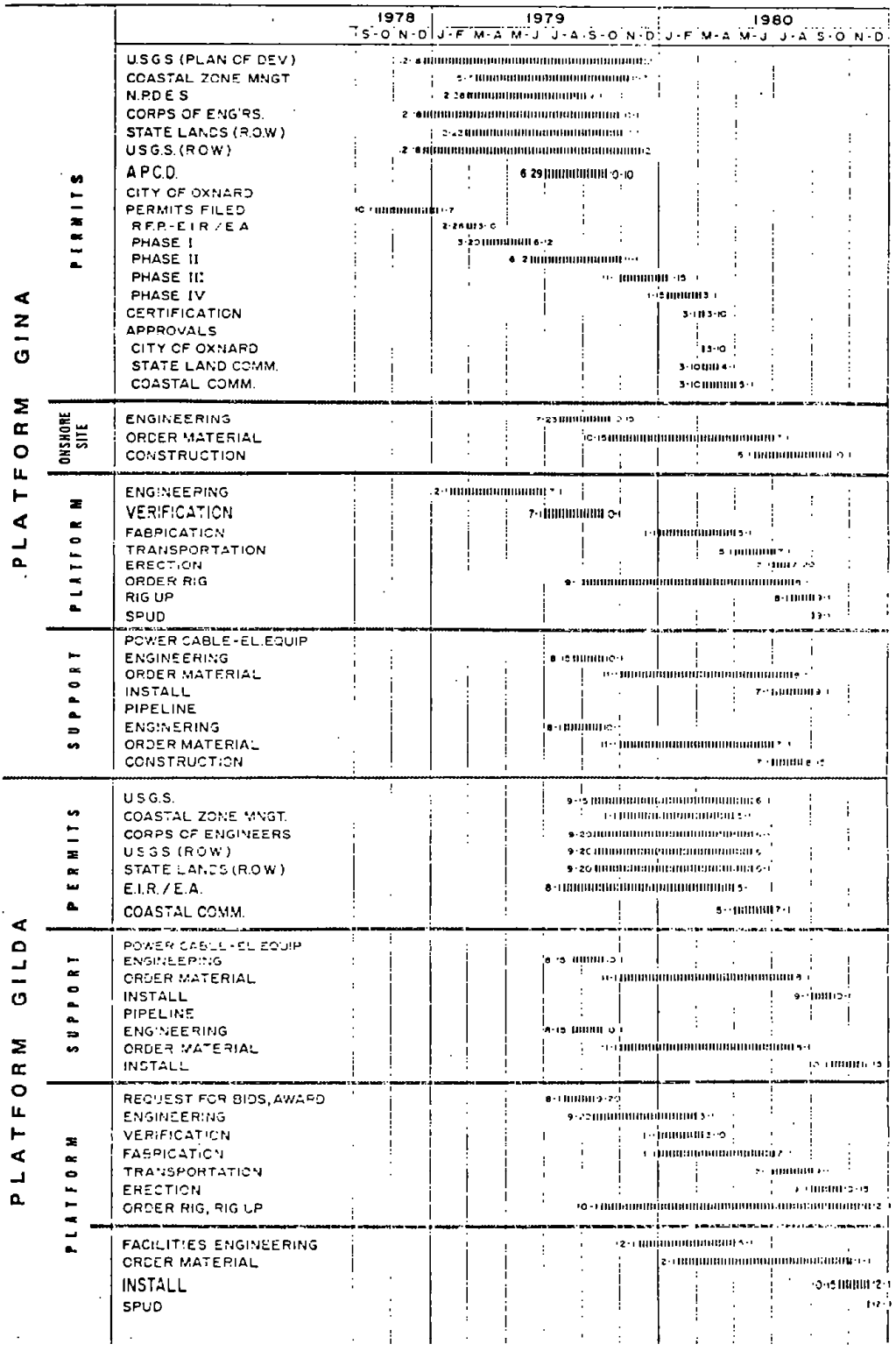
PROPOSED PIPELINE ROUTE

Source: Union Oil, 1979

Figure 2-4

ACTIVITY SCHEDULE

SANTA CLARA-HUENEME DEVELOPMENT



Source: Union Oil, 1979

Figure 2-5

FIGURE 2-6

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
OFFSHORE CONSTRUCTION

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		Engineers	2	2	
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		Laborers	20	2	
		Electricians	12	2	
		Supervisors	2	2	
		Engineers	2	2	

Platform crews to be changed-out weekly.

Source: Dundas Associates, 1979

FIGURE 2-7

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
OFFSHORE DRILLING & PRODUCTION SCHEDULE

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
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		Welders	2	3	
		Foreman	1		
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Source: Dundas Associates, 1979

FIGURE 2-8

PROPOSED PROJECT WORK FORCE
PLATFORM GILDA
PIPELINE CONSTRUCTION

Task	Time Schedule	Craft Or Skill	No. of Persons/Shift	No. of Shifts	Employment Duration
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		Supervisors	2	2	
		Engineers	2	2	
		Divers	2	2	

Source: Dundas Associates, 1979

FIGURE 2-9

PROPOSED PROJECT WORK FORCE
COMBINED PLATFORMS GINA AND GILDA
ONSHORE FACILITY CONSTRUCTION

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		Operational Engineers	5	1	3 Weeks
		Road Repair Gang	10	1	2 Weeks
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		Electricians	6	1	10 Weeks
		Operational Engineers	2	1	5 Weeks
		Millwrights	2	1	2 Weeks
		Laborers	6	1	12 Weeks
		Painters	6	1	4 Weeks
		Landscapers	10	1	4 Weeks

Not included: Supervision, Professional Engineers, Architects, and Draftsmen.

Source: Dundas Associates, 1979

SECTION 3

DESCRIPTION OF THE EXISTING ENVIRONMENT

3.1 Geology

Section II, "Geotechnical Review", of Union's Plan of Development for Parcel OCS P-0216 describes in detail the area geotechnical conditions of the Santa Clara Unit, specific conditions at the proposed site and a portion of the proposed pipeline route. A site-specific geotechnical review has been performed under the direction of Dames and Moore, contractor for the EIR/EA. Original data and their preliminary interpretations will be furnished as soon as this information becomes available.

3.2 Meteorology

The Southern California coast, from Point Conception to the Mexican border, is alternately interspersed with coastal mountains and broad, sweeping plains. Warm, dry summers and mild, wet winters typify the seasonal variations in weather. Along the Santa Barbara Channel, the average annual temperature variant is only about 13 degrees F., while the average daily temperature rarely exceeds 75 degrees F. (Pitas Point E/R, 1979, Ref. 12)

Much of Southern California derives its weather from a large, persistent air mass which gathers moisture as it moves easterly across the north Pacific. Compression raises the temperature of this already-warm air mass, causing it to precipitate as it moves southward along the California coast.

As these air masses move inland, mountains and other obstacles have a diminishing effect on their strength, and by the time they cross the promontory land mass of Point Conception, they are already to enter the Santa Barbara Channel area as gentle breezes (see Figure 3-1).

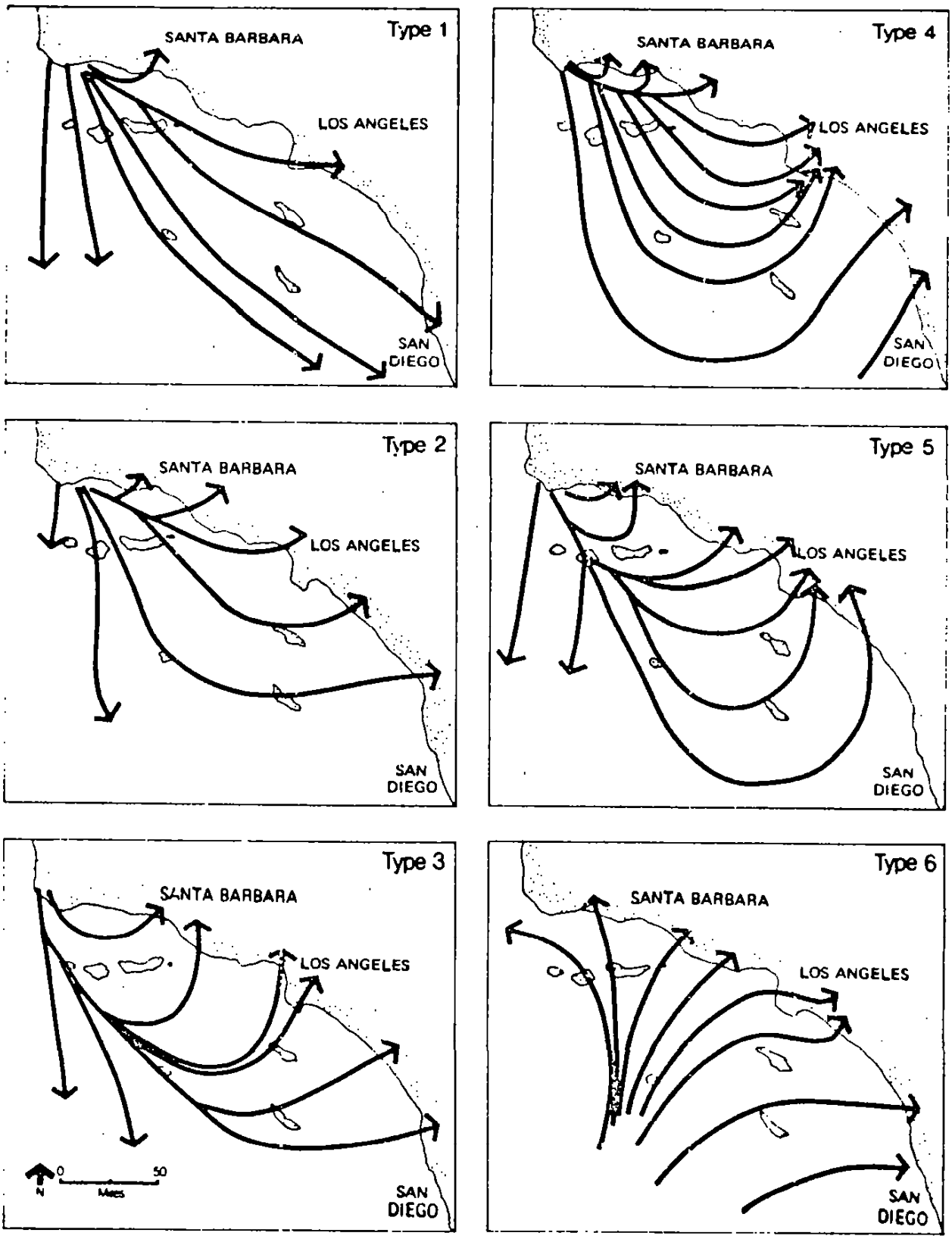


Figure 3: SIX COMMON WIND PATTERNS IN THE SOUTHERN CALIFORNIA BIGHT.

Source State Water Pollution Control Board. Oceanographic Survey of the Continental Shelf of Southern California. Publication No. 20, 1960, pp. 24-26.

Figure 3-1

By late spring, the inland desert areas are substantially warmer than the coastal regions; the heat-induced thermal low-pressure system over the desert then causes a strong onshore flow of marine air. Low clouds and prevailing haze, therefore, are typical features of late spring and early summer. By late fall, the high-pressure system over the Pacific begins migrating southward. This migration, combined with cooler desert air, usually signals the onset of the winter rainy season.

3.2.1 Temperatures

Mean daily temperatures through the Hueneme and Oxnard areas range from a low winter average of 42-50 degrees F. to a summer high of 75-90 degrees F. Fluctuations will occur, but taken in context, these figures represent an accurate average range. Cumulative data for coastal and inland temperatures are available annually from the U.S. Army Corps of Engineers and from the Naval Weather Station at Point Mugu.

3.2.2 Sky Cover and Visibility

Restricted sky cover is most frequent during early and late spring (April-June) throughout the Southern California coastal areas. Contributing to this phenomenon are: high relative humidities (85-90%) during nighttime and morning hours; low wind conditions; and low ambient temperatures.

Sky cover is directly influenced by ambient conditions of humidity, air movement, and temperature, which are naturally occurring phenomena. Man-induced smog (photochemical reactions and suspended particulate matter) is contributory to degradation of visibility as well. In combination with smog, but with fog being the primary cause for low visibility, a visibility range of two miles occurs between two and seventeen percent of the time in the east Santa Barbara Channel. (Personal Contact: U.S. Coast Guard Department of Transportation, Santa Barbara, 1979)

While brilliantly colored sunsets are aesthetically pleasing, the factors which cause them must not be overlooked. Color in sunsets is attributed to the existence of suspended particulate matter lying within the

light-scattering range of the color spectrum. The refractive index of the suspended particulates and their relationship to color wave-lengths form the visible sky cover. Thus, brilliantly colorful sunsets can be attributed to actual solid particles in the atmosphere, which, together with the natural diffusion of light, cause this regular phenomenon.

3.2.3 Wind Speed and Direction

Wind currents usually move southeasterly through the Santa Barbara Channel. Diurnal winds are primarily onshore in direction, while nocturnal winds usually move toward the ocean from the desert valleys, where they are generated. Terrain, however, can appreciably modify wind temperature and direction, especially along the coast. Thermal (solar) heating of the mountain slopes has a warming effect on the wind, while the cooling-off of the valleys at night causes the wind to reverse direction and begin flowing northwesterly, the opposite direction whence it came.

The average wind conditions for the general Santa Barbara Channel area from December through July are as follows: winds from the northwest, 48% of the time; 39% or more of the time, wind speeds exceed 20 knots. Ten-to-twenty knot winds are more rare, occurring 27% of the time; 5-to-10 knot winds are also common, occurring 34% of the time. Figure 3-2 illustrates the pattern of onshore breezes prevalent in the Ventura County coastal area. (Ventura County AQMP, 1978, Ref. 21)

3.3 Air Quality

3.3.1 Existing Onshore Air Quality

Photochemical oxidant (smog) is the single air contaminant of greatest concern within Santa Barbara and Ventura Counties. Smog consists primarily of ozone and ambient levels of photochemical oxidants which are measured in both counties as ozone. Oxidants are hazardous to human and animal health, causes damage to vegetation and to materials, and reduces visibility. During the past five years, measurements of average ambient levels of ozone in Santa Barbara and Ventura Counties have shown concentrations as high as two

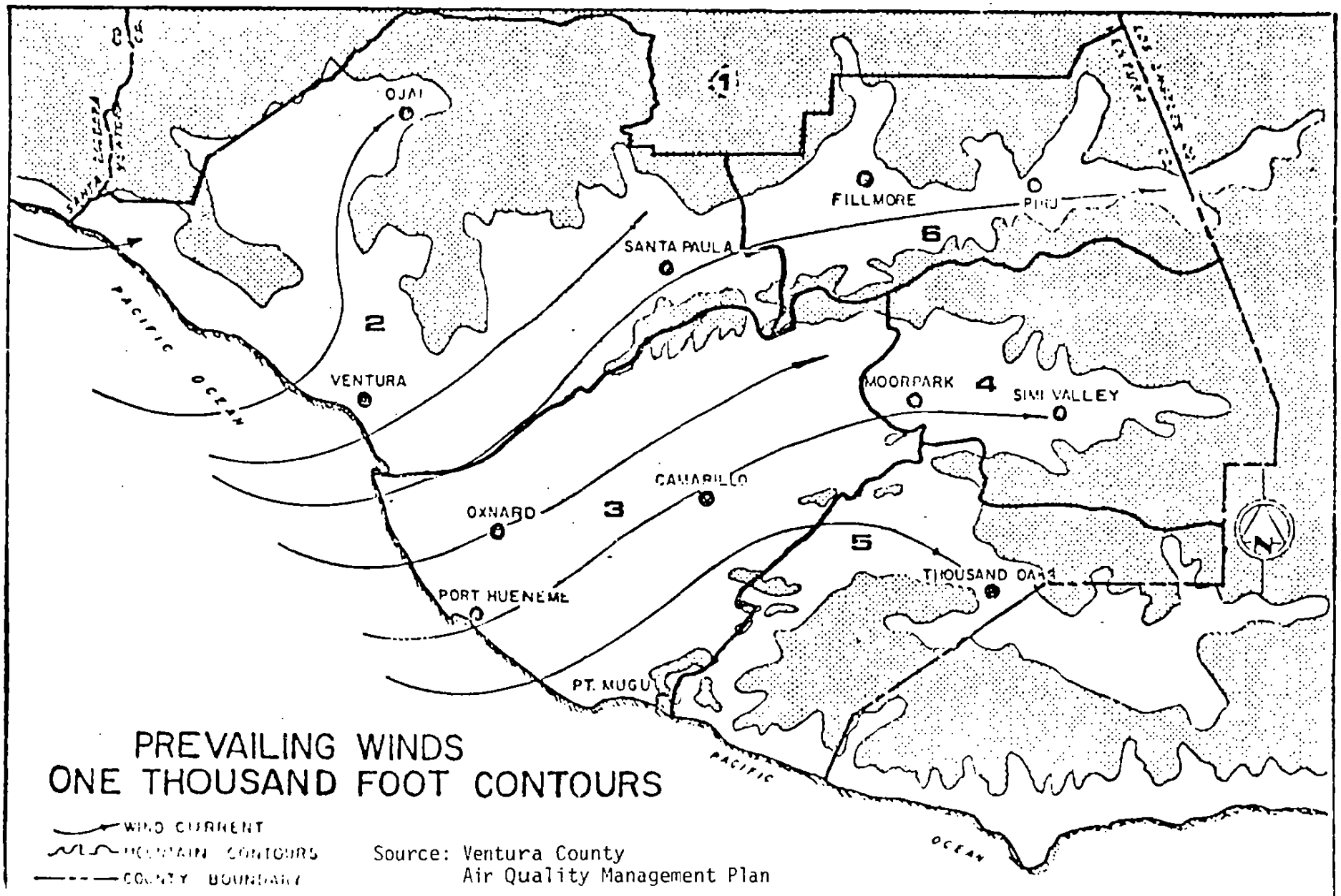

OJAI
FILLMORE
PIRU
SANTA PAULA
VENTURA
MOORPARK
SIMI VALLEY
CAMARILLO
OXNARD
PORT HUENEME
THOUSAND OAKS
PT. MUGU
PACIFIC OCEAN
1
2
3
4
5
6
N
PREVAILING WINDS
ONE THOUSAND FOOT CONTOURS
WIND CURRENT
COUNTY BOUNDARY
Source: Ventura County
Air Quality Management Plan

Figure 3-2

to three and three to four times the National Ambient Air Quality Standards (NAAQS), respectively, during the "smog season" (May through October). Some areas, such as the Simi and Ojai Valleys, have ozone concentrations 80 to 100 percent in excess of the NAAQS during certain days of the smog season.

Photochemical oxidants are complex chemical reactions formed in sunlight, involving reactive hydrocarbons (RHC) and nitrogen oxides (NO_X). Motor vehicles and industrial, commercial, institutional, and residential activities are the sources of RHC and NO_X emissions. The reaction of RHC and NO_X and sunlight, resulting in oxidant formation, takes several hours and is dependent primarily on ambient temperature, inversion height, ultraviolet intensity, ventilation, and the reactivity of the subject emissions. Prevailing sea breezes during the smog season tend to accumulate air pollutants against coastal mountain ranges and in the inland valleys. The photochemical reaction takes place during the transport of pollutants from one area to another. One inland area in the immediate vicinity of the project is the Ojai Valley, where some of the highest ozone concentrations have been recorded. The recent installation of a monitoring station by the Ventura County APCD in Piru in 1977 has shown that the inland portion of the Santa Clara River Valley also suffers from high ozone levels. Figures 3-1 and 3-2 depict the prevailing winds in Ventura County and in the Southern California coastal waters, thus illustrating the potential for transport of pollutants generated offshore into both Santa Barbara and Ventura Counties.

The total suspended particles (TSP) NAAQS is also frequently exceeded in Santa Barbara and Ventura Counties. Some particulates, such as lead and sulfates, are more harmful than others because of their toxicity, particularly if the particle size is small enough to be retained in the human respiratory system.

The carbon monoxide (CO) NAAQS is occasionally exceeded in the South Coast area of Santa Barbara County and in Ventura County.

The ambient levels of the other pollutants for which there are NAAQS (nitrogen dioxide, nonmethane hydrocarbons, and sulfur dioxide) are below the standard promulgated for both counties.

The California standards for sulfate, nitrogen dioxide, and lead have been exceeded on rare occasions in Santa Barbara and Ventura Counties, which can be attributed to localized meteorological anomalies.

Westerly/northwesterly winds tend to carry pollutants generated offshore in the Santa Barbara Channel into Santa Barbara and Ventura Counties. Inter-county transport of pollutants between Ventura, Santa Barbara, and Los Angeles Counties occurs in varying degrees, depending on wind regimes (Santa Barbara County AQMP, 1978, and Ventura County AQMP, 1978).

3.3.2 Potential Air Pollution Sources

Existing sources of air pollutants for Santa Barbara and Ventura Counties and their relative proportions are depicted in Figures 3-3 and 3-4. Detailed discussion of the sources of air pollutants in Santa Barbara and Ventura Counties, both existing and projected, is contained in the Air Quality Management Plans for these areas.

The potential sources of air pollution associated with the proposed project can be separated into two categories: 1) emissions associated with platform operations; and 2) emissions associated with onshore facilities.

3.3.3 Offshore Air Quality

At present, there are no air quality monitoring stations located in the Santa Barbara Channel or on any of the Channel Islands. The Ventura County APCD is currently installing an air quality monitoring station on Anacapa Island. Data monitored at this remote station will be telemetered to the VCAPCD central office for analysis.

Controversy currently exists regarding the possible impact of OCS source emissions on the NAAQS of states contiguous with OCS operations. Much of the controversy centers around non-attainment of NAAQS in California,

Santa Barbara County

COUNTYWIDE EMISSIONS INVENTORY - 1977
(Tons Per Year)

Source: Santa Barbara Air Quality Attainment Plan

SOURCE CATEGORY	RHC[3]	NO_x[2]	CO[2]	SO_x	TSP
1) Automotive	10,431.70	8,920.60	73,000.00	321.40[1]	1,131.0[illegible]
2) Gasoline Marketing	813.95	Ø	Ø	Ø	Ø
3) Solvent Use	711.75	Ø	Ø	Ø	Ø
4) Marine Terminals	29.93	Ø	Ø	Ø	Ø
5) Petroleum Production	722.70	390.55	138.70	1.10[4]	1[illegible].60
6) Pesticides/Herbicides	430.70	Ø	Ø	Ø	Ø
7) Aircraft	339.45	167.90	2,350.60	19.10[1]	15.2[illegible]
8) Waste Burning	127.75	1.46	4,807.05	4,06[4]	155.1[illegible]
9) Stationary Fossil Fuel Consumptions	635.10	1,101.05	2,390.75	405.84[1]	93.51
10) Natural Gas Flare	Ø	843.15	Ø	Ø	Ø
11) Ag Cleaning & Drying	Ø	1,022.00	Ø	4.4[4]	138.00[4]
12) Other Stationary		95.63	40.15	22.1[4]	1,370.20[4]
TOTAL	14,243.03	12,542.34	82,727.25	778.00	2,925.6[illegible]

1) Automotive: surface street and freeway traffic.
2) Gas Marketing: service stations, fleet pumps and bulk plants.
3) Solvent Use: stoddard, perchloroethylene, trichloroethane, paint spray; lacquer and enamel, architectural coating, sealers, anti-freeze, ethylene glycol, alcohols and ketones.
4) Marine Terminals: OCS and tidelands; tanker loading and floating roofs.
5) Petroleum Production: fixed roofs, valves and flanges, platforms.
6) Pesticides/Herbicides: pesticides and weed oils.
7) Aircraft: Santa Barbara, Santa Ynez, and Santa Maria Airports and Vandenberg Air Force Base.
8) Waste Burning: waste burns, structural fires, and incinerators.
9) Stationary Fossil Fuel Consumptions: internal combustion compressors, utility equipment, boilers, and natural gas use.
10) Natural Gas Flare: Getty Oil flare in Santa Maria area.
Agricultural Cleaning and Drying: agricultural cleaning and dryings.
12) Other Stationary: asphalt patching, concrete batching, diatomaceous earth milling.

[1]APCD, 1978
[2]Nordsieck, 1978
[3] Nordsieck, 1978 and 1979
[4]APCD Documentation, 1978

Figure 3-3

TABLE III-8

EMISSION INVENTORY FOR VENTURA COUNTY - 1977
(Tons Per Year)

(Excluding North Half, RSA 1)

EMISSION SOURCE CATEGORY	RHC SSE*	RHC ASE**	NOx SSE	NOx ASE	SO SSE	SO ASE	TSP SSE	TSP ASE	CO SSE	CO ASE
1. Petroleum										
A. Production	1855									
B. Refining	58				3					
C. Marketing	2037									
D. Combustion	341		8074		2		44		1206	
2. Organic Solvent Users										
A. Surface Coating	109	1509					8			
B. Dry Cleaning	17									
C. Degreasing	19	1007								
D. Other										
3. Chemical			1		1		7			
4. Metallurgical					2		19		5	
5. Mineral							240			
6. Food & Ag. Processing	265						11			
7. Pesticides										
A. Agricultural		5334								
B. Governmental		193								
C. Structural		533								
8. Wood Processing							64			
9. Combustion of Fuels										
A. Power Plants	595		8648		15,312		1351		967	
B. Other Industrial	17		505		67		41		201	
C. Domestic/Commercial	3	63	54	805	8	1	7	79	8	160
D. Orchard Heaters		142				1		1		292
10. Waste Burning										
A. Agricultural Debris										
B. Forest Management		397						672		4520
C. Range Improvement										
D. Dumps										
E. Conical Burners										
F. Incinerators	2		3		3		8		11	
G. Other										
11. Misc. Area Source										
A. Wild Fires		119		239				2028		15515
B. Structural Fires		8		5				71		309
C. Farm Operations								8619		
D. Const./Demo								1703		
E. Unpaved Roads								2136		
F. Utility Equip.		172		14				4		1349
SUB TOTAL - STAT.	14,792		18,347		15,398		17,117		24,543	
12. Motor Vehicles - On Road	13,167		11,540		613		1,549		125,13[illegible]	
13. Jet Aircraft		213		112		47		170		470
14. Piston Aircraft		370		50		2		5		1837
15. Railroads		49		199		1		13		70
16. Ships		2		3		5		5		3
17. Off Road Vehicles		455		611		40		9		5053
SUB TOTAL - OFF ROAD		[illegible]		975		124		247		7433
SUB TOTAL - MOBILE	14,[illegible]		12,515		737		1,[illegible]		132,[illegible]	
TOTAL (Except On Road MV	5316	14,561	12,284	2038	15,374	136	1800	[illegible]5,517	2399	[illegible]5,577
Motor Vehicle-On road	13,167		11,540		613		1,549		125,[illegible]	
GRAND TOTAL	29,046		30,862		16,137		18,866		157,106	

* Stationary Source Emissions
** Area Source Emissions

Source: Ventura County APCD, 1978

Figure 3-4

which might unduly impose penalties upon OCS activities. WOGA, in hearings before DOI, has asked for consistency in EPA's own regularions where those regulations specifically exempt EPA preconstruction reviews of onshore planned activities when allowable ground level concentrations of emissions are not exceeded.

WOGA, in support of industry hearings, contracted with Teknekron, Inc., of Berkeley, California, to apply modeling techniques to determine worst-case onshore impacts resulting from OCS operations. The following is a summary of the Teknekron Report (Ref. 23):

> "The exemption threshold allowed for offshore emission sources should be higher than for sources located onshore. Because a plume rapidly spreads and dilutes as it leaves an emission source, a facility located on the OCS will have a lesser impact on onshore air quality than a source of otherwise equivalent emission characteristics located at the shoreline or inland. The further offshore the OCS source is located, the higher the exemption limit should be. Furthermore, the point of maximum surface concentration for an OCS source will occur over water and not onshore."

3.4 Physical Oceanography

3.4.1 Ocean Depth

Ocean depth from the Santa Barbara Channel region south to the proposed project site varies considerably. Mildly sloping near the shore, the sea floor deepens rapidly to the north-south coastal traffic lanes to a depth of approximately 200 fathoms (1,200 feet). At the proposed project site, ocean depth from mudline to Mean Low Lower Water (MLLW) depth is 210 feet.

3.4.2 Sea Temperature and Salinity

Sea surface temperatures in the Santa Barbara Channel near the project site vary from a January-April low of 55 degrees F. to a high of 65 degrees F. during August-September (Kolpack, 1971). The salinity level, recorded in May, 1971, was 33.6 parts per thousand. In December, 1971, a salinity level of 33.8 parts per thousand was recorded. The December increase in the salinity level was attributed to the colder water temperature (Office of Planning and Research: Offshore Oil and Gas Development, Southern California, Ref. 4).

3.4.3 Currents and Velocity

Primarily, ocean currents in and around the region of the proposed platform flow southeasterly when somewhat distant from shore; the currents closer to the shore, on the other hand, seem to flow in a predominantly northwesterly direction. Figure 3-5 exemplifies this pattern.

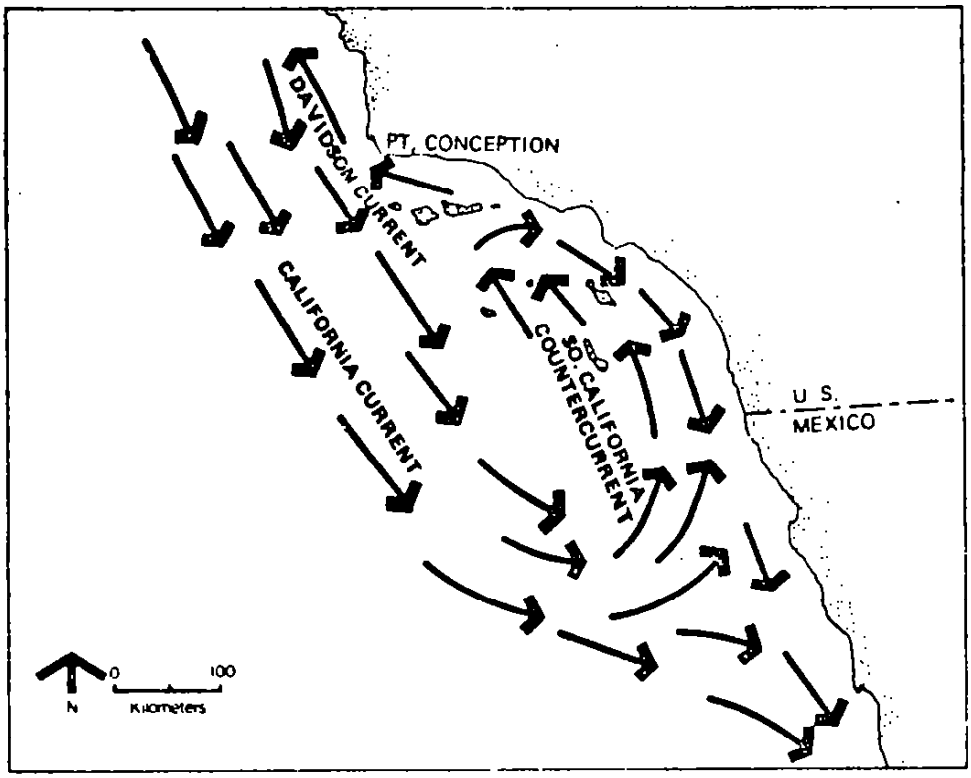
Some references (Jones, 1971, Ref. 26; Kolpack, 1971, Ref. 15) describe this varied current as chiefly a downcoast current. However, another study (Reid, 1965, Ref. 27) depicts the flow as being mostly upcoast from June to March, downcoast from early April to late May, and most strongly developed in December and January.

At the proposed platform site, it is estimated that currents ranging from 0.4 to 1.0 knot will occur from one to four hours daily at the surface, with mid-water and near-bottom currents attaining from 50% to 80% of that rate of speed. Based on a sustained (at least one hour) wind velocity of 50 knots, the relation of wind-induced currents will be 1.5 knots at the surface, decreasing to roughly 0.5 knots at the near-bottom level.

3.4.4 Tides

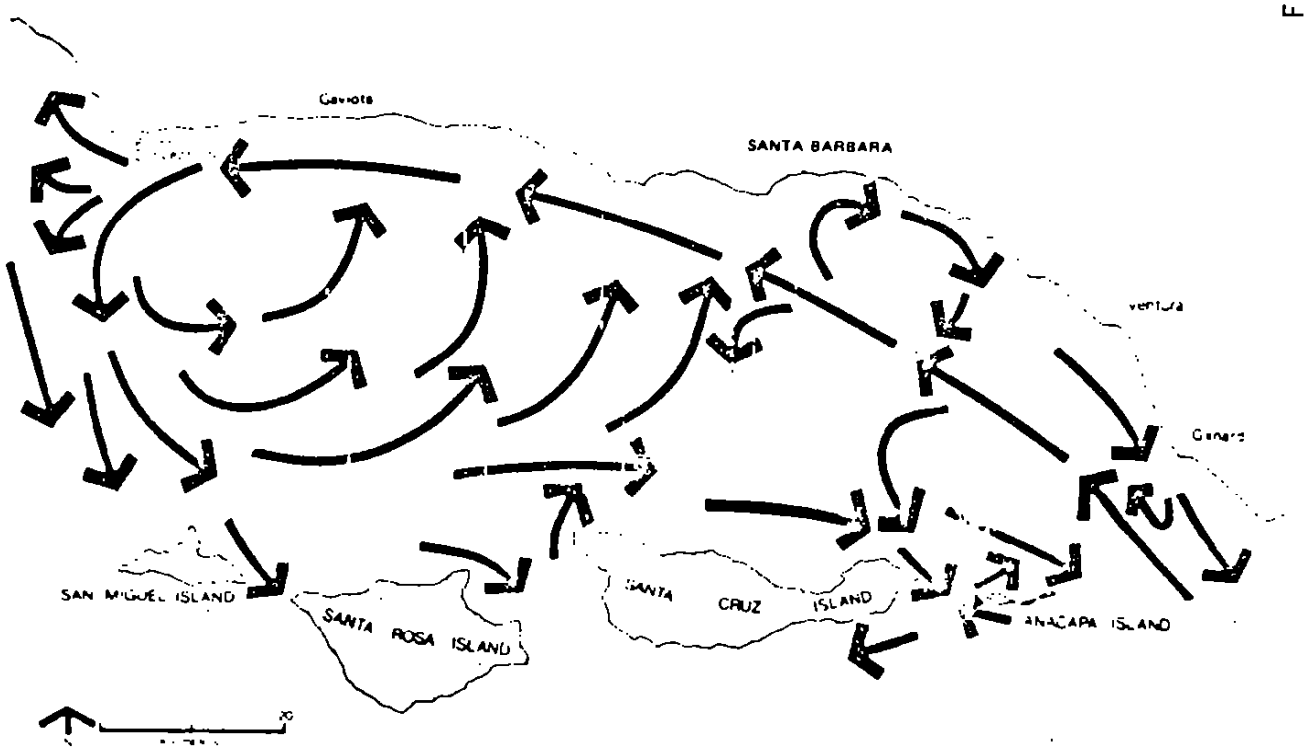
The tides in the locale of the proposed platform fall into two categories: diurnal and semidiurnal. In the case of diurnal, a high and a low tide each occur daily. In the case of the latter, the water level

Figure 5: GENERALIZED PATTERN OF SURFACE CURRENTS OFF SOUTHERN CALIFORNIA.



Source. United States Department of the Interior, Geological Survey. Final Environmental Statement – Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf of California, Figure II - 19, 1976.

Figure 6: GENERALIZED PATTERN OF SURFACE CURRENTS, SANTA BARBARA CHANNEL.



Source Ronald L. Kolpack "Relationship of Migration of Natural Seep Material to Oceanography of Santa Barbara Channel," unpublished report August 1976.

Figure 3-5

reaches two daily highs and two daily lows. One of these daily highs is substantially more voluminous than its counterpart. The higher of the highs is referred to as the higher high water (HHW) level; the lower of the lows is referred to as the lower low water (LLW) level. In the Santa Barbara Channel region, the mean high tide range is 3.7 feet, with a mean diurnal range (from mean HHW to mean LLW) of 5.3 feet (NOAA, 1974, Ref. 28).

Extreme tides will occur twice annually at the proposed platform site, in June or July and again in December or January. These "solstice tides", so named because of their occurrences near the summer and winter solstices, are caused by the increased effect of the sun on the diurnal tide as the sun's declination reaches its two annual maxima (Woodward-Clyde, 1979). The range between these extreme tides is from -1.5 feet LLW to +7.0 feet HHW in the Santa Barbara Channel region (Ibid).

3.4.5 Sea State

Surface wave data in the Santa Barbara Channel was summarized by the Naval Weather Service Command (1971) for the period of 1949-1970. The central and eastern portions of the Channel usually generate relatively small waves. The larger waves usually occur in March; the frequency of occurrence of large (nine-foot) waves is about 15 percent of total wave activity. Conversely, July and August usually produce the smallest waves, 95 percent of which are under six feet (Ibid).

Rare storm activity and the protection afforded by the Santa Ynez Mountains combine to keep surface waves relatively mild. Additional information on surface waves and tsunamis is available in the USGS report (Ref. 19).

3.4.6 Existing Water Quality

The overall quality of Southern California surface water varies

widely. Local precipitation, patterns of runoff, reuse of water, and groundwater and waste disposal into local tributaries, all play a role in the water's physical makeup. Reuse of the water tends to add to the accumulation of these effects. Municipal discharges in particular tend to leave long-term residual traces in the water as well, especially when improperly treated.

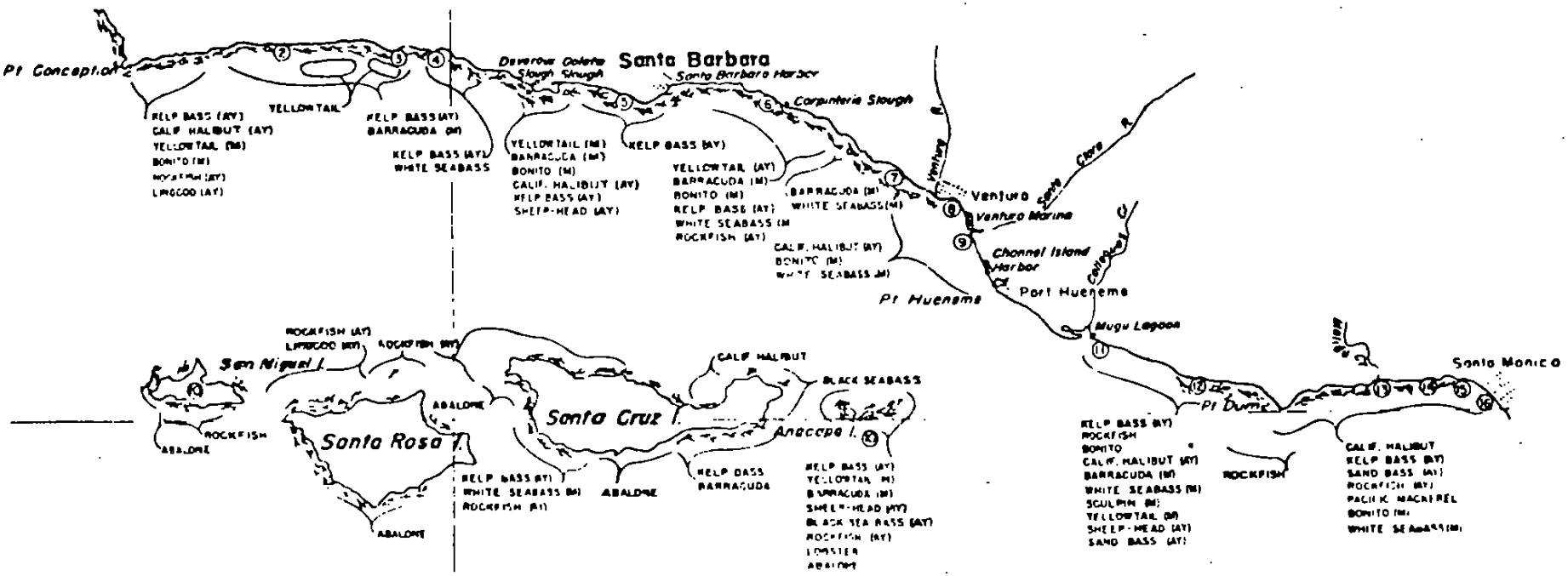
Several Southern California estuarine communities, principally the Mugu and Santa Clara River estuaries, depend upon treated sewage effluent as their primary source of fresh water. Often overlooked is the fact that municipalities and counties have diverted the natural water courses to serve community needs. While some fresh water returns to the water courses as irrigation runoff, the predominant source of water (during the eight-to-nine month dry season) is treated sewage effluent.

A detailed discussion of the principal Santa Barbara Channel coastal estuaries and biologically sensitive areas can be found in a supplemental report (September, 1979) of the Hueneme Offshore Platform E/R (Ref. 29). This report is obtainable from Union Oil Company of California.

3.5 Other Uses of the Area

3.5.1 Commercial Fishing

The proposed platform site is in one of the primary commercial fishing areas in the Southern California coastal region. Commercial and sport fishing are responsible for the primary and secondary incomes of many regional communities. Commercial fishing in 1975 in the Santa Barbara Channel area generated more than $3.25 million in income. In that same year, Port Hueneme alone earned $1.32 million in commercial fishing revenues. The role these figures play in the general economic composition cannot be ignored (see Figures 3-6 and 3-7).



APPROXIMATE LOCATIONS OF IMPORTANT COASTAL FISHES
(US Coast Guard, 1972)

Figure 3-6

LANDINGS AND VALUE OF COMMERCIAL FISH AND SHELLFISH BY PORT, 1975

PORT	POUNDS	VALUE
Santa Barbara		
Red abalone	519,890	$492,721
Sea urchin	2,569,620	210,111
Black abalone	594,152	221,975
Pink abalone	183,440	154,845
Spot prawn	129,774	144,008
Rockfish	991,101	135,904
California spiny lobster	51,052	107,729
Swordfish	60,463	95,053
Rock crab	269,629	54,308
California halibut	44,270	34,559
English sole	124,844	21,337
Bluefin tuna	80,751	19,402
Ridgeback prawn	27,507	15,451
Shark	38,265	9,772
White seabass	9,017	6,716
Petrale sole	22,324	5,232
Salmon	2,555	3,484
Green abalone	3,016	2,635
Threaded abalone	4,385	2,239
Rex sole	11,116	2,114
White abalone	887	1,127
Sablefish	17,437	1,031
Albacore	3,324	1,057
All other species	23,878	3,587
Port totals	5,783,176	$1,639,368
Ventura		
Rockfish	47,810	$7,349
Sea urchin	77,239	6,197
White croaker	24,870	4,573
Shark	16,071	1,774
California halibut	1,755	1,370
Salmon	749	1,000
All other species	2,052	1,598
Port totals	179,355	$28,356
Oxnard		
Sea urchin	2,315,293	$135,750
Swordfish	25,977	41,659
Rockfish	122,959	20,671
California halibut	17,913	13,333
Pink abalone	1,525	1,287
All other species	8,605	3,366
Port totals	2,492,212	$215,756
Port Hueneme		
Northern Anchovy	50,871,300	$794,031
Sea urchin	2,125,435	170,532
Pacific bonito	937,791	116,724
Market squid	5,117,325	109,433
Bluefin tuna	281,100	67,540
California halibut	22,746	17,755
Rockfish	79,824	12,959
Swordfish	7,655	12,278
California spiny lobster	3,581	7,557
Spot prawn	6,233	5,917
Shark	21,899	5,543
English sole	8,869	1,516
White croaker	6,463	1,189
White seabass	1,438	1,071
All other species	10,174	2,335
Port totals	57,550,838	$1,327,431
Study Area Total	67,956,641	$3,262,221

Source:
Bybee and Richards, 1979

Figure 3-7

Offshore oil platforms actually encourage commercial fishing activity. By establishing a permanent habitat for the many hundreds of species of fish that are found in the Hueneme region, and the entire Channel area in general, the procreation rate of these fish is bound to expand. However, an area of approximately two acres on which the platform is situated will be excluded from commercial fishing activities.

A study of marine resources at Platforms Hilda and Hazel, conducted by the University of California (Ref. 25), has concluded:

> "The community of organisms in a soft-bottom area where there were no platforms was different from the community associated with the platforms, both in kinds and numbers of animals. Divers estimated that a portion of the soft bottom the same size as the platforms supported less than 500 fish (the estimates of the number of fish present at the oil platforms on different days ranged from 8,000 to 30,000)....
>
> Actual counts of the numbers of polychactes in sediment samples taken near one of the platforms revealed that the abundance of these animals increased with increasing proximity to the structure. From these counts, the investigators estimated that each platform was enriching an area of ocean bottom of between 15,000 and 30,000 square feet."

3.5.2 Shipping

The majority of ocean vessel traffic patterns in Southern California are confined to the legally established traffic lanes between Point

Conception and the Los Angeles Harbor Complex. The flow of foreign and domestic vessels in the Channel between Point Conception and Port Hueneme averages 6.6 vessels per day northbound, and 6.0 vessels per day southbound (U.S. Coast Guard, 1978, from Bybee-Richards Report Ref. 2). The proposed platform site is a sufficient distance away from these established lanes to preclude the liklihood of a vessel-platform collision.

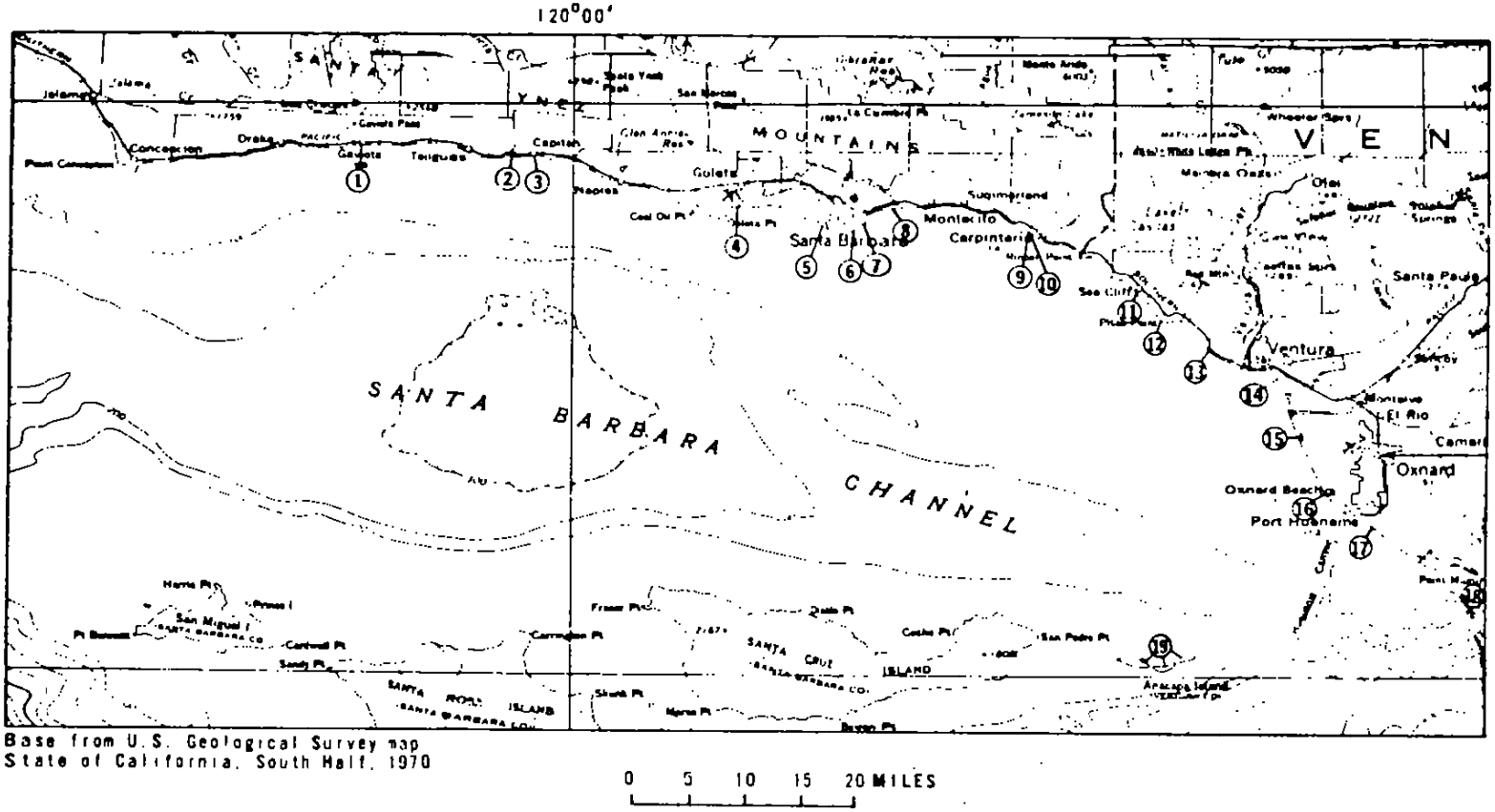
3.5.3 Military Uses

Between Point Conception and Point Mugu, there are two military bases. The military services are the second-highest producers of income in Ventura County, ranking second only to agriculture. San Miguel, one of the Channel Islands, is completely controlled by the U.S. Navy, and access is restricted; a three-mile danger zone has been set up around the island.

The proposed platform site is located approximately 50 miles distant from the Pacific Missile Testing Area. Consequently, it is improbable that installation of the proposed platform will result in any significant impact on military use of the area. All area military commanders will be advised of the proposed platform project.

3.5.4 Boating and Recreation

The Santa Barbara Channel is used extensively for small-craft pleasure boating and other recreational activities. The single most unique recreational feature of Ventura County is its long Pacific shoreline. Few coastal counties in California have more miles of beaches suitable for boating facilities, fishing, and general play use (see Figure 3-8). Without doubt, the coastline is the county's outstanding recreational resource (Offshore Oil and Gas Development, Office of Planning and Research, 1977, Ref. 4).



1. Gaviota State Beach
2. Refugio State Beach
3. El Capitan State Beach
4. Goleta Beach Co. Park
5. Arroyo Burro Beach Co. Park
6. Leadbetter Beach
7. West Beach
8. East Beach
9. Carpenteria State Beach
10. Carpenteria City Beach
11. Hobson Co Park
12. Faria Co Park
13. Emma K. Wood State Beach
14. San Buenaventura St. Beach
15. McGrath State Beach
16. Oxnard Beach
17. Ormand Beach
18. Point Mugu State Park
19. Channel Islands Nat. Mon

Beaches and Parks in the Point Conception-Point Mugu Coastal area

Figure 3-8

Slips and small-craft moorings of the three active pleasure-boat harbors in the Channel - Santa Barbara, Ventura, and Oxnard - total more than 3,400, with Oxnard and Santa Barbara accounting for more than 80% of the berths (Bybee and Richards, 1979, see Figure 3-9). The Ventura County Property Administration Agency, which administers the county's harbors, has indicated that Oxnard and Ventura Harbors have additional facilities to expand accommodations to a maximum of 2,500 moorings each.

The three small-craft harbors derive approximately $10 million annually from slip and mooring fees. Additionally, close to $3 million will probably be spent on direct and indirect goods and services.

Being located in the Santa Barbara Channel, the proposed site is in an intensive-use area for both small crafts and commercial fishing vessels. This heavy use can be interpreted two ways: a) The proposed platform is located in the midst of an active waterway, so it will probably be a hindrance or hazard to the small craft which frequently utilize the area; and b) The proposed platform will rapidly become, as have its sister platforms in the Channel, a useful and valuable navigational guide, or landmark.

The first argument has its valid points; until regional boaters become familiar with the proposed platform, there will undoubtedly be some confusion. This will quickly subside, however, and recreational boaters will quickly come to recognize the proposed platform site as a Hueneme landmark. Significantly, almost all recreational boating in the area takes place during daylight hours. This fact further reduces the chances of any mishaps occurring at or around the proposed platform site.

Small-craft boaters will soon recognize and utilize the proposed platform as a useful navigational landmark. This is especially true in the Port Hueneme area, where fog and haze frequently obscure visibility from offshore.

PORT FACILITIES OF THE SANTA BARBARA CHANNEL

Facility Description	HARBOR			
	Santa Barbara	Ventura	Oxnard	Port Hueneme
Approximate Water Distance From:				
San Pedro	95 mi.	70mi.	65 mi.	65 mi.
Port San Luis	125 mi.	150 mi.	160 mi.	160 mi.
Ice	NO	NO	YES	NO
Haul-out	YES	YES	YES	NO
Fuel	YES	YES	YES	YES
Cargo Hoist	YES	YES	YES	YES
Launch Ramp	YES	YES	YES	NO
Live Bait	YES	YES	YES	YES
Coast Guard	YES	NO	YES	NO
Commercial Fishing Boats	164	9	115	14
Party Boats	4	3	10	4
Berths:				
Slips	1,008	700	1,660	20
Moorings	39	20	0	0

Source: Bybee and Richards (1979)

Figure 3-9

3.5.5 Flora and Fauna

The Channel Islands are the most significant islands in the coastal perimeter of Southern California. According to the National Park Service, nowhere else in the South Pacific Border natural region are so many important natural-history themes found at individual sites, and nowhere are they so interrelated to one another. The geologic history has been most important in retaining the many unique plant and animal species found on the islands (BLM, Final E/S, OCS Sale No. 48, 1979, Ref. 3).

As the climate became drier and less temperate throughout California during the Miocene and Pliocene eras, the islands' fauna communities gradually became isolated and restricted, due to stronger maritime conditions than their mainland counterparts. Eventually, many species were eliminated from the mainland area and now survive only on the Channel Islands. Thus, tree communities became insular forests in order to survive in California's unique climate.

The Channel Islands support many species of terrestrial flora and fauna not found on the mainland. The intertidal and subtidal areas surrounding the islands support many one-degree endemics, organisms with a natural north-south range of 60 miles, and an abundance of diverse tidepool plants and animals.

Some of the species of animals found on the Santa Barbara Channel Islands which have evolved considerably include, but are not limited to, the following: the California brown pelican, the only remaining breeding colonies of which are on Anacapa Island and Scorpion Rock, off the coast of Santa Cruz Island; and the Island Fox, which is currently found only on San Miguel, Santa Rosa, Santa Cruz, Santa Catalina, San Clemente, and San Nicholas Islands. The remoteness of the Channel Islands and the protection of the locale by military and private landowners are of paramount importance to the proliferation of the species (USGS, FES-76-13, 1976, Ref. 18).

The species of fauna which are found on the Channel Islands are currently in a state of evolution. The species of these fauna have and will continue to become more and more highly specialized with the passage of time. This can only be taken as a positive sign; the fact that these species are healthy enough to change with their environment is a clear indication that these species are thriving.

According to the Marine Mammal Commission, the Channel Islands and surrounding waters support one of the world's most extensive varieties of marine mammals. Human activity in Southern California has disturbed these marine mammals to the point that they no longer breed at their previously-established coastal rookeries. Today, seals and sea lions breed and pup almost exclusively on the Channel Islands. San Miguel Island and its associated rocks form the primary pinniped habitat in Southern California, due to the climate and a plethora of low, sandy beaches. The islands in general also provide an excellent sanctuary for animals with a low tolerance for human disturbance (California Office of Planning and Research, 1977, Ref. 4).

A biological survey has been made by Dames and Moore, contractor for the EIR/EA of Platform Gilda. This information will be furnished as it becomes available.

3.5.6 Cultural Resources

California's prehistory is generally accepted to extend back 10-to-12,000 years before the present (B.P.), although some evidence of early Indian cultures in the Santa Barbara Channel Islands dates back 37,000 years. Other informational sources state that early cultures are traceable as far back as 125,000 B.C.

Artifact finds along California's coastal lands and in shallow ocean water sites are relatively scarce, and in many instances, not readily identifiable because of errosive current and tidal actions. More

detailed information of early cultural resources is discussed in the EIR, Resumption of Drilling Operations in the South Elwood Offshore Oil Field (Ref. 9).

Site-specific archeological investigations are currently in progress by Dames and Moore. The results of this survey will be provided as it becomes available.

3.5.7 Environmentally Sensitive Areas

Federal- and state-designated environmentally sensitive areas include the following: marine sanctuaries; estuarine and wetland sanctuaries; national monuments; state oil and gas sanctuaries; areas of special biological significance (ASBS); ecological preserves; and marine-life refuges. Each of these environmentally sensitive areas are discussed in detail in the supplementary report to the Hueneme Offshore Platform E/R (Dundas Associates, 1979, Ref. 29).

Many of these habitats are sensitive to disturbances related to petroleum exploration; often, the disturbed species will migrate to nearby wetlands or other suitable habitats. Numerous rocky outcroppings form subsurface ridges and shelves, which are shallow enough to afford suitable protection to even the smallest of the species.

Some of the sensitive coastal resources in close proximity to the proposed platform site include: Mugu Lagoon, in the southern part of Ventura County; Santa Clara River Estuary, at the mouth of the Santa Clara River, immediately south of the city of San Buenaventura; Ventura River Estuary, at the mouth of the Ventura River near the northern boundary of the city of San Buenaventura; and most signigicant, the Santa Barbara Channel Islands, a group of islands along the southern coastal extremity of the Santa Barbara Channel, including, but not limited to, San Miguel, Santa Rosa, Santa Cruz, and Anacapa Islands. The Channel Islands, because of their tidal pools, marine birds, mammalian rookeries and habitats, are

considered to be among Southern California's most sensitive natural resources.

Another critical factor in the area's value as a coastal resource is the islands' role as an essential feeding, nesting, and breeding zone for resident and transitory seabirds. Shearwaters, petrels, murrelets, auklets, gulls, and other pelagic species all utilize the area, and are among the species most often sighted in OCS lease areas.

Rocky intertidal areas, or more specifically, tidepools and their unique inhabitants, are a heavily exploited marine-related resource in California. Most marine species endemic to the coastal area depend on tidepools for some phase of their very existence.

An important, yet often overlooked, resource found in the Ventura County coastal region is the sand dunes. The Mandalay dunes, between the Santa Clara River and Port Hueneme, and the Point Mugu dunes, on the coastal stretch in the southernmost portion of the county, are primarily credited with preventing the erosion of the area immediately inland of the dunes. Formation of the dunes usually begins when blowing sand gathers, gradually building up to the point where the dunes become more of a protective buffer than an obstruction, as they earlier had been.

Flora and fauna utilize the dunes as habitat, and generally serve as a stabilizing influence. Roots from vegetation will "anchor" themselves in the sand, thwarting any tendency toward erosion. Dunes also protect coastal salt marshes and wetlands; nesting habitat for the snowy plover and California least tern is another benefit.

A 40-acre sandy beach area, located within Point Mugu State Park, makes up the bulk of that area's dune formations. Here, too, the dunes provide an important habitat for many nesting birds.

Access to the dunes is limited by Section 30210 of the California Coastal Act, which requires that beach access and use be consistent with the protection of natural resources.

3.5.8 Pipelines and Cables

Pipelines and cables connecting the proposed platform with the on-shore facility are expected to have insignificant impact hazard potential, as long as the pipeline integrity is maintained (Ref. 24). It is conceivable that pipelines placed in the near-shore and tidal zones could cause some temporary disturbance to the sessile organisms, as well as to some species of fish and other mobile organisms. These effects would be temporary, however, with any necessary repopulation occurring rapidly, within one to two years (USGS, FES-76-13, 1976, Ref. 19).

3.5.9 Other Mineral Uses

No minerals of any consequence are in the area of the proposed platform site.

3.6 Socio-Economic Effects

3.6.1 Related Employment and Unemployment

The local (Ventura County) employment rate is unlikely to sustain any effects, whether they be beneficial or detrimental, as a result of the proposed platform construction, exploration, developmental, or production phases.

3.6.2 Related Population and Industry Locations

Local industry may have stimulus for growth due to the anticipated increased availability of natural gas supplies. An assured supply of this preferred fuel could indirectly encourage local labor market employment opportunities.

3.6.3 Delineation of Existing Community Services

Police, fire protection, sewer, and other public services are likely to sustain very minor impacts as a result of approval of the proposed project. An anticipated five families will be coming to the area as a result of platform activity. In an area the size of Ventura County, five families will account for such a small increase as to be hardly measurable.

The county's growth rate will not be affected sufficiently to require any change to the present sewage systems in existence in the region.

The relatively minor increase in population will not adversely affect the tax structure in the county; income generated by new tax revenues will be quickly absorbed, as a result of the rapid growth rate already present in the county.

3.6.4 Public Opinion as it Relates to Additional Industrialization

No assessment of public opinion has been made regarding further industrial development within the area.

3.6.5 Existing Transportation Systems and Facilities

The anticipated five-family influx will have an insignificant impact on existing public transportation services in any part of Ventura County.

3.6.6 Supply and/or Existence of Coastal Resources

No additional coastal resources or supplies will be needed or require modification to handle hydrocarbon development from OCS P-0216. Bulk storage facilities for diesel fuel, drilling muds and cement already exist at Port Hueneme Harbor.

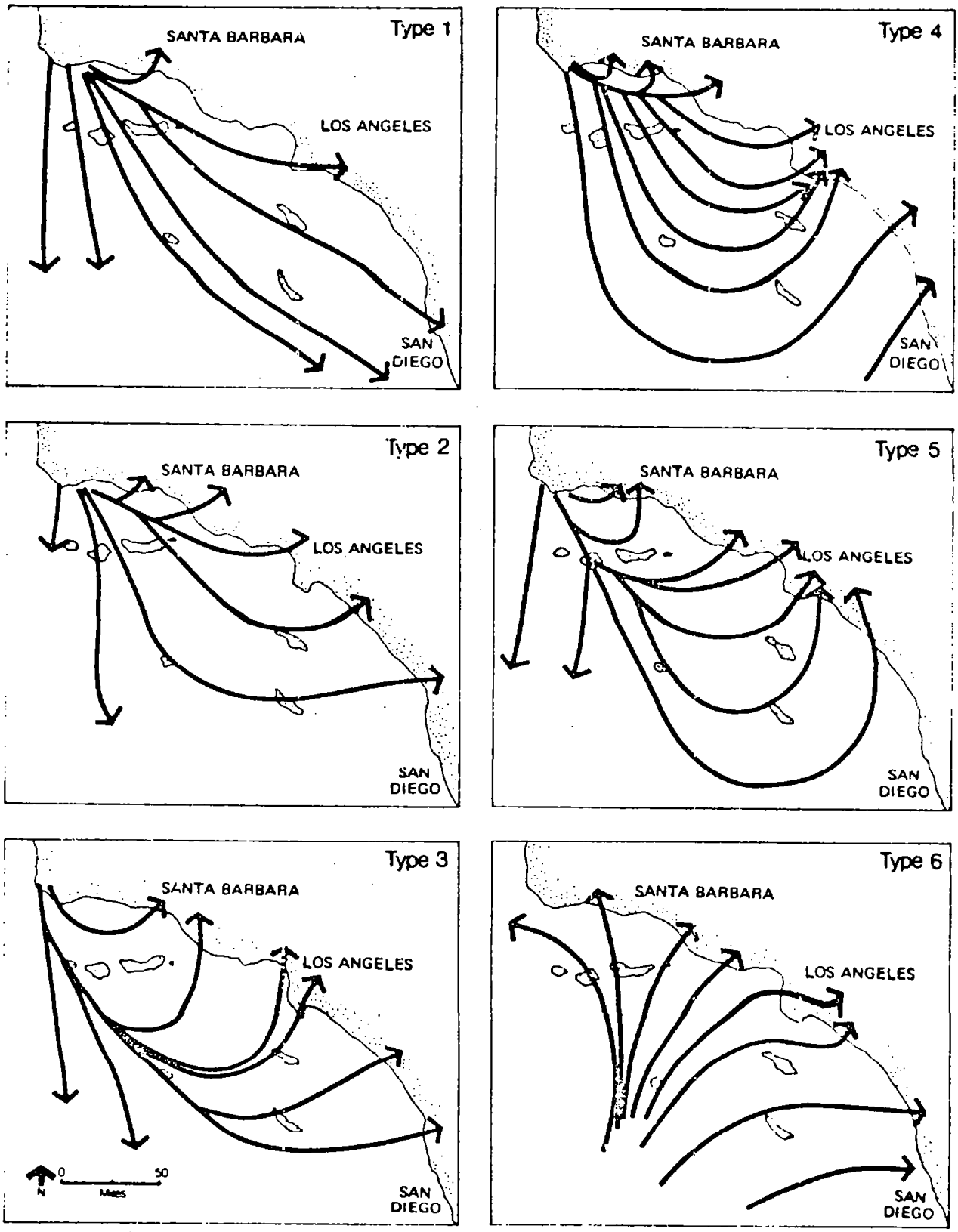


Figure 3: SIX COMMON WIND PATTERNS IN THE SOUTHERN CALIFORNIA BIGHT.

Source: State Water Pollution Control Board. Oceanographic Survey of the Continental Shelf of Southern California. Publication No. 20, 1959. pp. 24-26.

Figure 3-1

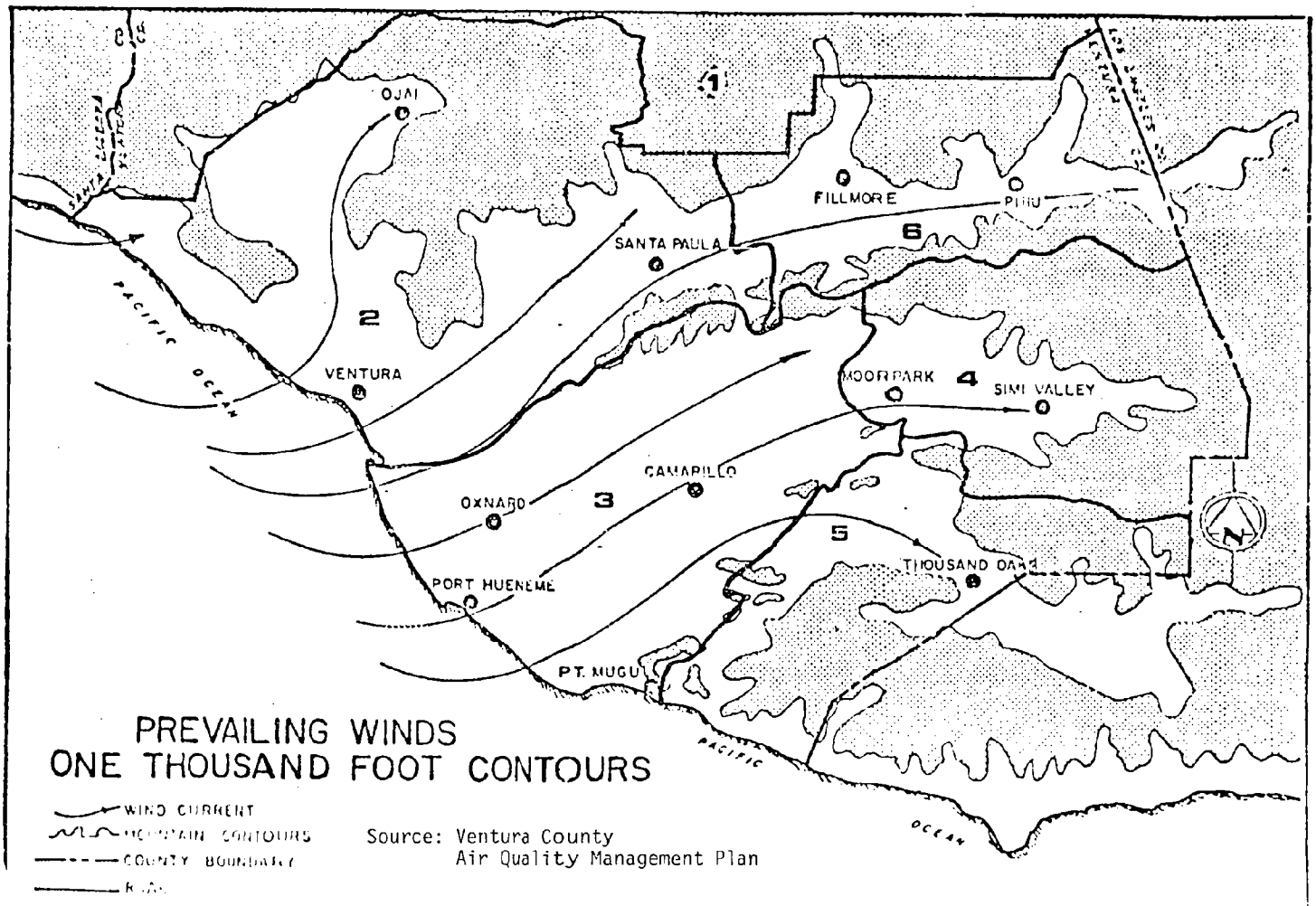

OJAI
FILLMORE
PIRU
SANTA PAULA
VENTURA
MOORPARK
SIMI VALLEY
OXNARD
CAMARILLO
PORT HUENEME
THOUSAND OAKS
PT. MUGU
PACIFIC OCEAN
1
2
3
4
5
6
N
PREVAILING WINDS
ONE THOUSAND FOOT CONTOURS
WIND CURRENT
COUNTY BOUNDARY
Source: Ventura County
Air Quality Management Plan

Figure 3-2

Santa Barbara County

COUNTYWIDE EMISSIONS INVENTORY - 1977
(Tons Per Year)

Source: Santa Barbara Air Quality Attainment Plan

SOURCE CATEGORY	RHC[3]	NO_x[2]	CO[2]	SO_x	TSP
1) Automotive	10,431.70	8,920.60	73,000.00	321.40[1]	1,131.00
2) Gasoline Marketing	813.95	Ø	Ø	Ø	Ø
3) Solvent Use	711.75	Ø	Ø	Ø	Ø
4) Marine Terminals	29.93	Ø	Ø	Ø	Ø
5) Petroleum Production	722.70	390.55	138.70	1.10[4]	1.60
6) Pesticides/Herbicides	430.70	Ø	Ø	Ø	Ø
7) Aircraft	339.45	167.90	2,350.60	19.10[1]	15.20
8) Waste Burning	127.75	1.46	4,807.05	4,06[4]	155.10
9) Stationary Fossil Fuel Consumptions	635.10	1,101.05	2,390.75	405.84[1]	98.51
10) Natural Gas Flare	Ø	843.15	Ø	Ø	Ø
11) Ag Cleaning & Drying	Ø	1,022.00	Ø	4.4[4]	138.00[4]
12) Other Stationary		95.63	40.15	22.1[4]	1,370.20[4]
TOTAL	14,243.03	12,542.34	82,727.25	778.00	2,925.61

1) Automotive: surface street and freeway traffic.
2) Gas Marketing: service stations, fleet pumps and bulk plants.
3) Solvent Use: stoddard, perchloroethylene, trichlocroethane, paint spray; lacquer and enamel, architectural coating, sealers, anti-freeze, ethylene glycol, alcohols and ketones.
4) Marine Terminals: OCS and tidelands; tanker loading and floating roofs.
5) Petroleum Production: fixed roofs, valves and flanges, platforms.
6) Pesticides/Herbicides: pesticides and weed oils.
7) Aircraft: Santa Barbara, Santa Ynez, and Santa Maria Airports and Vandenberg Air Force Base.
8) Waste Burning: waste burns, structural fires, and incinerators.
9) Stationary Fossil Fuel Consumptions: internal combustion compressors, utility equipment, boilers, and natural gas use.
10) Natural Gas Flare: Getty Oil flare in Santa Maria area.
Agricultural Cleaning and Drying: agricultural cleaning and dryings.
12) Other Stationary: asphalt patching, concrete batching, diatomaceous earth milling.

[1]APCD, 1978
[2]Nordsieck, 1978
[3] Nordsieck, 1978 and 1979
[4]APCD Documentation, 1978

Figure 3-3

TABLE III-8

EMISSION INVENTORY FOR VENTURA COUNTY - 1977
(Tons Per Year)

(Excluding North Half, RSA 1)

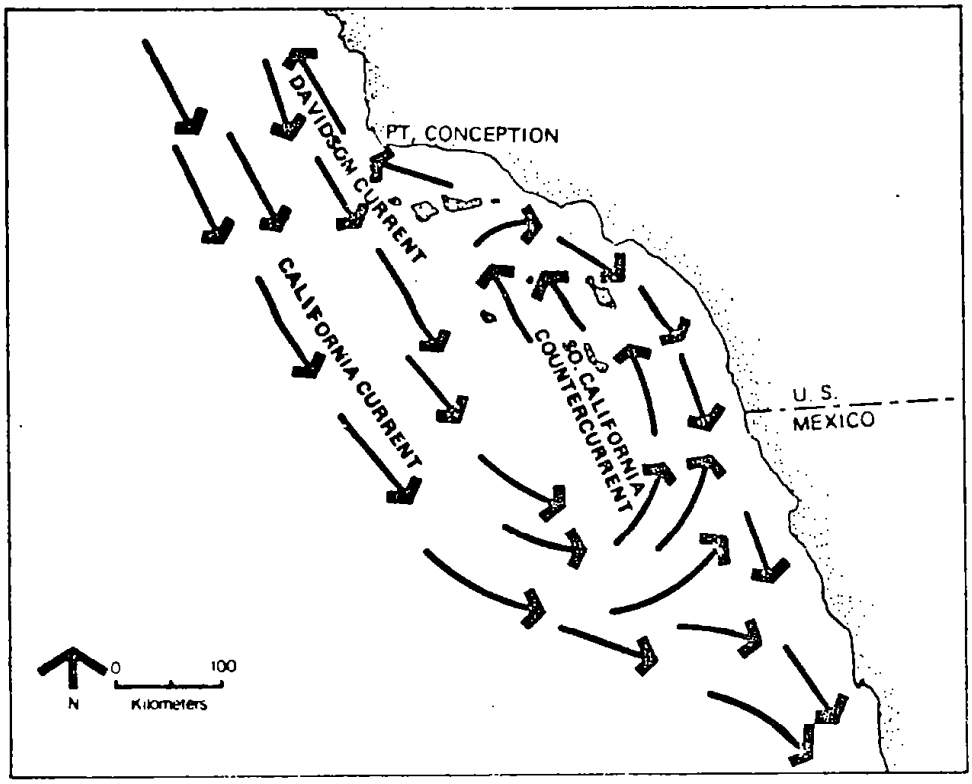
EMISSION SOURCE CATEGORY	RHC		NOx		SO		TSP		CO	
	SSE*	ASE**	SSE	ASE	SSE	ASE	SSE	ASE	SSE	ASE
1. Petroleum										
A. Production	1855									
B. Refining	58				3					
C. Marketing	2037									
D. Combustion	341		8074		2		44		1206	
2. Organic Solvent Users										
A. Surface Coating	109	1509					8			
B. Dry Cleaning	17									
C. Degreasing	19	1007								
D. Other										
3. Chemical			1		1		7			
4. Metallurgical					2		19		5	
5. Mineral							240			
6. Food & Ag. Processing	265						11			
7. Pesticides										
A. Agricultural		5334								
B. Governmental		193								
C. Structural		533								
8. Wood Processing							64			
9. Combustion of Fuels										
A. Power Plants	595		8648		15,312		1351		967	
B. Other Industrial	17		505		67		41		201	
C. Domestic/Commercial	3	63	54	805	8	1	7	79	8	160
D. Orchard Heaters		142				1		1		292
10. Waste Burning										
A. Agricultural Debris										
B. Forest Management		397						672		4520
C. Range Improvement										
D. Dumps										
E. Conical Burners										
F. Incinerators	2		3		3		8		11	
G. Other										
11. Misc. Area Source										
A. Wild Fires		119		239				2028		15515
B. Structural Fires		8		5				71		309
C. Farm Operations								8619		
D. Const./Demo								1709		
E. Unpaved Roads								2138		
F. Utility Equip.		172		14				4		1348
SUB TOTAL - STAT.	14,792		18,347		15,398		17,117		24,543	
12. Motor Vehicles - On Road	13,167		11,540		613		1,549		125,130	
13. Jet Aircraft		213		112		47		170		470
14. Piston Aircraft		370		50		2		5		1837
15. Railroads		49		199		1		13		70
16. Ships		2		3		5		5		3
17. Off Road Vehicles		455		611		40		8		5053
SUB TOTAL - OFF ROAD		1087		975		124		247		7433
SUB TOTAL - MOBILE	14,254		12,515		737		1,796		132,563	
TOTAL (Except On Road MV	5318	13,561	17,264	2038	15,398	126	1850	15,517	2394	6,577
Motor Vehicle-On Road	13,167		11,540		613		1,549		125,130	
GRAND TOTAL	29,046		30,862		16,137		18,866		157,106	

* Stationary Source Emissions
** Area Source Emissions

Source: Ventura County APCD, 1978

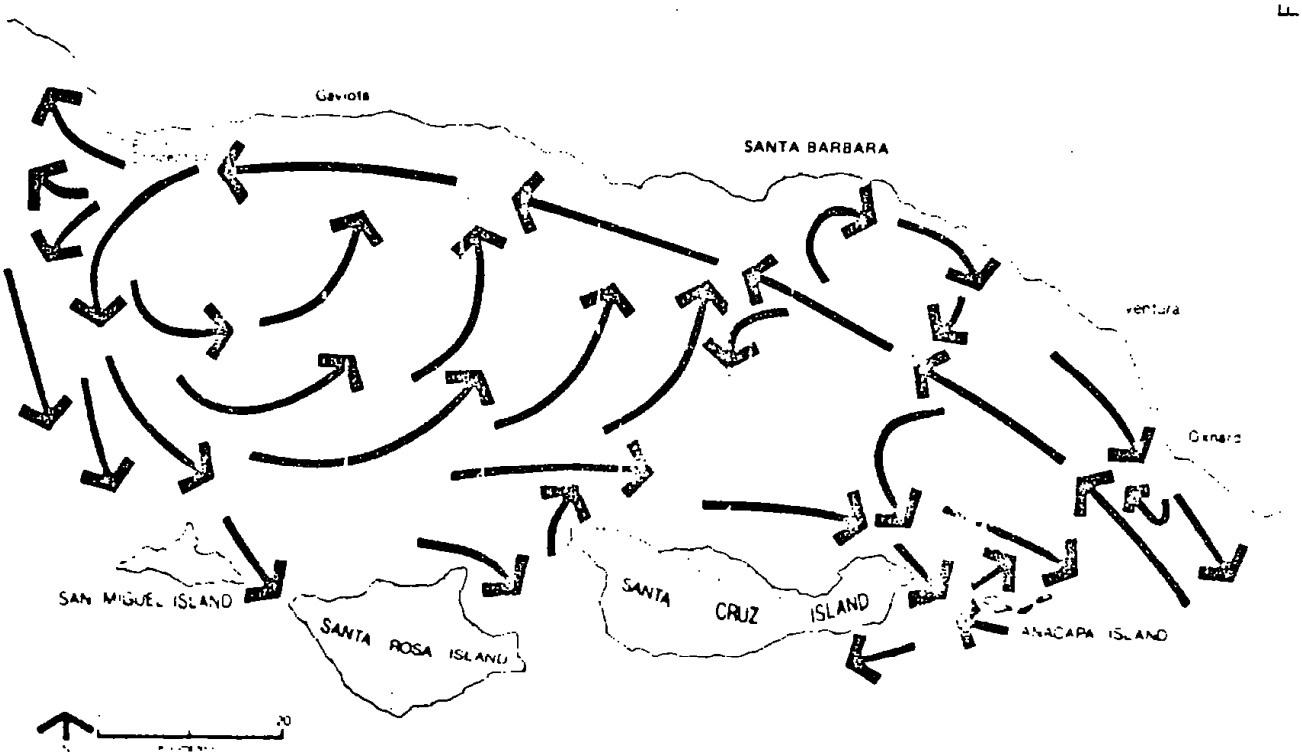
Figure 3-4

Figure 5: GENERALIZED PATTERN OF SURFACE CURRENTS OFF SOUTHERN CALIFORNIA.



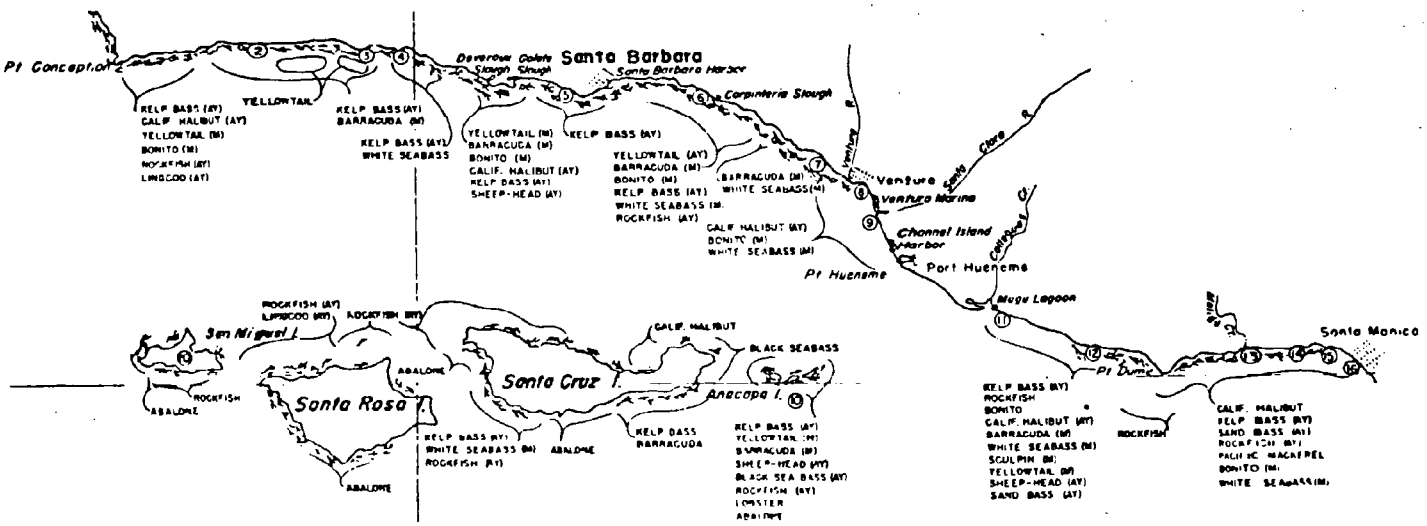
Source: United States Department of the Interior, Geological Survey. Final Environmental Statement – Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf of California, Figure II - 19, 1976.

Figure 6: GENERALIZED PATTERN OF SURFACE CURRENTS, SANTA BARBARA CHANNEL.



Source: Ronald L. Kolpack "Relationship of Migration of Natural Seep Material to Oceanography of Santa Barbara Channel," unpublished report August 1978.

Figure 3-5



APPROXIMATE LOCATIONS OF IMPORTANT COASTAL FISHES
(US Coast Guard, 1972)

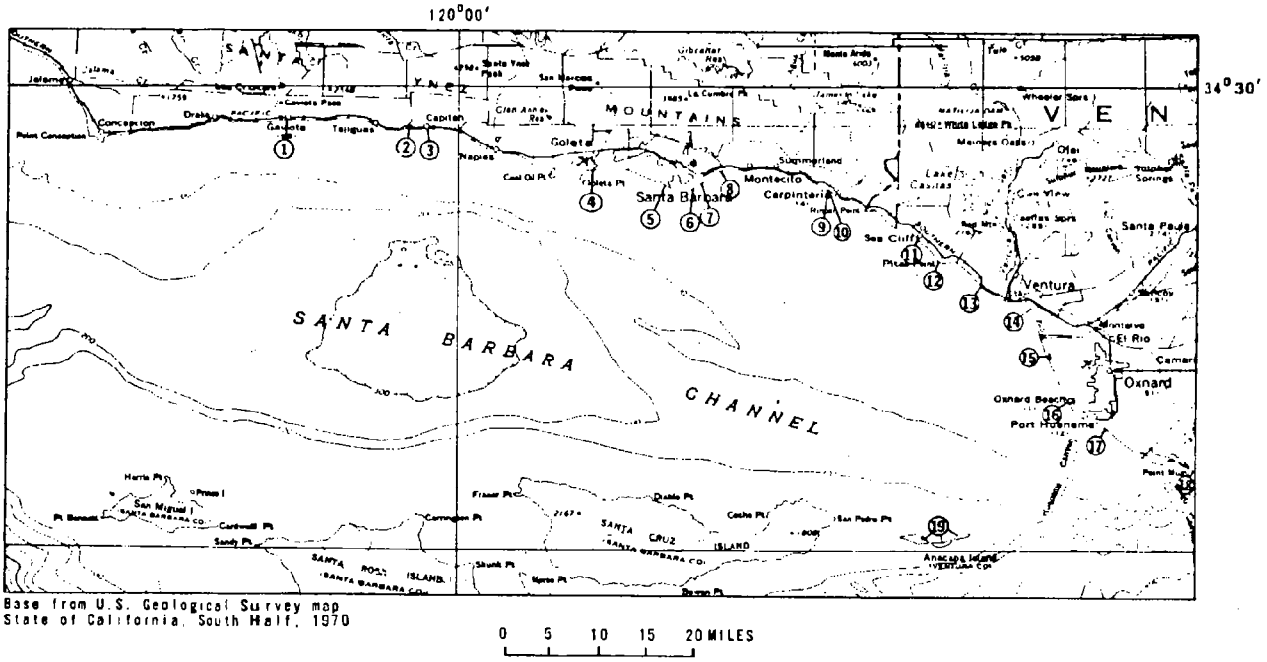
Figure 3-6

LANDINGS AND VALUE OF COMMERCIAL FISH AND SHELLFISH BY PORT, 1975

PORT	POUNDS	VALUE
Santa Barbara		
Red abalone	519,890	$402,721
Sea urchin	2,569,620	210,111
Black abalone	594,152	201,975
Pink abalone	183,440	154,845
Spot prawn	129,774	144,098
Rockfish	991,101	136,904
California spiny lobster	51,052	107,729
Swordfish	60,463	95,963
Rock crab	269,628	54,308
California halibut	44,270	34,559
English sole	124,844	21,337
Bluefin tuna	80,751	19,402
Ridgeback prawn	27,607	15,451
Shark	38,265	9,772
White seabass	9,017	6,716
Petrale sole	22,334	5,232
Salmon	2,565	3,454
Green abalone	3,016	2,665
Threaded abalone	4,385	2,239
Rex sole	11,116	2,114
White abalone	887	1,127
Sablefish	17,437	1,091
Albacore	3,324	1,057
All other species	23,878	3,567
Port totals	5,783,176	$1,639,363
Ventura		
Rockfish	47,810	$7,949
Sea urchin	77,233	6,137
White croaker	24,870	4,573
Shark	16,071	1,774
California halibut	1,755	1,370
Salmon	749	1,030
All other species	2,052	1,606
Port totals	179,355	$28,556
Oxnard		
Sea urchin	2,315,298	$135,750
Swordfish	25,917	41,559
Rockfish	122,959	20,871
California halibut	17,848	13,933
Pink abalone	1,525	1,287
All other species	8,605	3,366
Port totals	2,492,212	$265,865
Port Hueneme		
Northern Anchovy	50,871,300	$794,031
Sea urchin	2,125,495	170,522
Pacific bonito	937,791	116,724
Market squid	5,117,325	109,433
Bluefin tuna	281,100	67,540
California halibut	22,745	17,755
Rockfish	79,824	12,959
Swordfish	7,655	12,278
California spiny lobster	3,581	7,557
Spot prawn	6,233	6,917
Shark	21,898	5,543
English sole	8,869	1,516
White croaker	6,468	1,189
White seabass	1,438	1,071
All other species	10,174	2,335
Port totals	59,501,578	$1,327,431
Study Area Total	67,956,641	$3,262,221

Source:
Bybee and Richards, 1979

Figure 3-7



1. Gaviota State Beach
2. Refugio State Beach
3. El Capitan State Beach
4. Goleta Beach Co. Park
5. Arroyo Burro Beach Co. Park
6. Leadbetter Beach
7. West Beach
8. East Beach
9. Carpenteria State Beach
10. Carpenteria City Beach
11. Hobson Co. Park
12. Faria Co Park
13. Emma K. Wood State Beach
14. San Buenaventura St. Beach
15. McGrath State Beach
16. Oxnard Beach
17. Ormand Beach
18. Point Mugu State Park
19. Channel Islands Nat. Mon

Beaches and Parks in the Point Conception-Point Mugu Coastal area.

Figure 3-8

PORT FACILITIES OF THE SANTA BARBARA CHANNEL

Facility Description	HARBOR			
	Santa Barbara	Ventura	Oxnard	Port Hueneme
Approximate Water Distance From:				
San Pedro	95 mi.	70mi.	65 mi.	65 mi.
Port San Luis	125 mi.	150 mi.	160 mi.	160 mi.
Ice	NO	NO	YES	NO
Haul-out	YES	YES	YES	NO
Fuel	YES	YES	YES	YES
Cargo Hoist	YES	YES	YES	YES
Launch Ramp	YES	YES	YES	NO
Live Bait	YES	YES	YES	YES
Coast Guard	YES	NO	YES	NO
Commercial Fishing Boats	164	9	115	14
Party Boats	4	3	10	4
Berths:				
Slips	1,008	700	1,660	20
Moorings	39	20	0	0

Source: Bybee and Richards (1979)

Figure 3-9

SECTION 4

IMPACT EVALUATION AND MITIGATING MEASURES

4.1 Geological Conditions

The Santa Barbara Channel region is an active seismic area, and the potential for triggering geological processes has been recognized. The proposed platform location on OCS P-0216 and a portion of the pipeline route have been examined for surface and shallow hazards. The results of this high resolution geophysical survey by Aquatronics in December, 1974, conclude that no surface anomalies exist at the site and that the soil at the site has excellent qualities for the platform foundation.

Mitigating measures will include:

1) A static and dynamic foundation soil testing program has been performed by Fugro, Inc., Long Beach, California.

2) Design of the platform will be in accordance with API RP-2A, Tenth Edition. This recommended practice is to ensure that the platform design will have sufficient energy absorption capacity to prevent its collapse during rare but intense earthquake motions.

4.2 Meteorology

A single platform at a remote location will have no significant impact on meteorological conditions. During periods of extreme high winds or severe storms, construction and drilling operations will be curtailed.

4.3 Air Quality

Air quality impacts associated with construction of the proposed project will be largely due to diesel engine exhausts during the erection of the platform, placement of the subsea pipelines, and construction activities at the onshore facility. Following construction activities and during the drilling phase, air quality impacts will result from diesel engine operation of crew and supply boats, platform cranes, emergency fire pump, and emergency generation of electric power, and occasional use of helicopters.

During the operational phase, offshore air quality impacts will result from diesel engine emissions associated with drilling and production operations, crew and supply boat movements, use of platform cranes, testing of emergency support equipment, and occasional helicopter usage. In addition to diesel exhaust emissions, a negligible amount of natural gas will be released to the atmosphere from emulsified gas entrained in the drilling muds as they are recirculated and screened to remove drill cuttings. Onshore, production emissions will be associated with natural gas firing of heater-treaters. Other equipment components such as pumps, compressers, etc., will be electric-motor driven.

4.3.1 Assessment of Construction Emissions

Construction of the platform and subsea pipelines will require approximately fourteen weeks. Emissions during this time will vary with the level of activity and the tasks to be performed. These emissions, while not insignificant, would be generated approximately ten miles offshore. Although the prevailing sea breezes would disperse emissions, they would be carried onshore considerably diluted. The construction period would, however, be of short duration. Therefore, emissions would not significantly adversely impact ambient air quality over the long term.

Onshore construction activities would require a period of six to eight weeks, and would involve diesel-driven earthmoving equipment, cranes,

and welding equipment. Again, the construction period would be of short duration, with no significant degradation of ambient air quality over the long term.

4.3.2 Assessment of Offshore Platform Emissions

Since Platforms Gina and Gilda would be operated simultaneously, the assessment and mitigation of emissions are discussed collectively, even though from a lease-management perspective, the Department of the Interior views each platform as a separate federal action. Both Gina and Gilda offshore production platforms consist of production equipment only. No storage facilities for produced oil and gas will exist on the platforms. However, diesel fuel will be stored in the crane pedestal for operation of diesel prime movers. Platform equipment emitting air contaminants are:

a) Platform Gina (Drilling Phase - One Year)

1) One 500 HP cementing unit (diesel powered) - operating 24 to 36 hours per month for approximately the first year, after which time it will be removed.

2) One 120 HP fire pump engine (diesel powered) - operated for testing purposes one hour per month.

3) One 140 HP crane engine (diesel powered) - operated 50 to 80 hours per month, which will drop to five to ten hours per month after the first year.

4) One 15 HP emergency generator engine (diesel powered) - operated for testing purposes one hour per month.

Figure 4-1 quantifies the expected air pollution emissions from this equipment.

FIGURE 4-1

AIR EMISSIONS

OFFSHORE PLATFORM GINA

Equipment/Emissions		P.M.	SO_x	NO_x	HC	CO
Cementing Unit	(LB/HR) max.	1.102	1.026	15.432	1.235	3.340
(1-500 HP)	(TONS/YEAR)	0.238	0.222	3.333	0.267	0.721
Fire Pump Engine	(LB/HR) max.	0.265	0.246	3.704	0.296	0.802
(1-120 HP)	(TONS/YEAR)	0.002	0.001	0.022	0.002	0.005
Crane Engine	(LB/HR) max.	0.309	0.287	4.321	0.346	0.935
(1-140 HP)	(TONS/YEAR)	0.148	0.138	2.074	0.166	0.449
Emergency Gen. Engine	(LB/HR) max.	0.033	0.031	0.463	0.037	0.100
(1-15 HP)	(TONS/YEAR)	0.000	0.000	0.003	0.000	0.001
TOTAL	(LB/HR) max.	1.709	1.590	23.920	1.914	5.177
	(TONS/YEAR)	0.388	0.361	5.432	0.435	1.176

AIR POLLUTANT EMISSIONS AFTER THE 1ST YEAR

		P.M.	SO_x	NO_x	HC	CO
TOTAL	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YEAR)	0.021	0.018	0.544	0.023	0.062

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

562-79

b) Platform Gilda (Drilling Phase - Four Years)

1) One 500 HP cementing unit (diesel powered) - operating 48 to 72 hours per month for approximately four years, after which time it will be removed.

2) One 120 HP fire pump engine (diesel powered) - operated for test purposes one hour per month.

3) Two 140 HP crane engines (diesel powered) - operating 100 to 160 hours per month after the first year.

4) One 15 HP emergency generator (diesel powered) - operated for testing purposes one hour per month.

Figure 4-2 quantifies the expected air pollution emissions from this equipment.

Figures 4-3a and 4-3b total the expected air pollution emissions from operations on Platforms Gina and Gilda.

Assumptions used in calculating offshore emissions have been:

1) Equipment will operate at 100% load factor during the hours specified.

2) Emission factors are calculated using EPA AP 42, Section 3.3.3, dated January, 1975.

3) First-year emissions are calculated using a worst-case scenario.

Mitigating Measures:

1) Total offshore air contaminant emissions, generated after the first year of operation, will be substantially reduced due to reduced operation of the cranes and removal of the cementing unit from Platform Gina.

FIGURE 4-2

AIR EMISSIONS

OFFSHORE PLATFORM GILDA

Equipment/Emissions		P.M.	SO_X	NO_X	HC	CO
Cementing Unit	(LB/HR) max.	2.204	2.052	30.864	2.470	6.680
(1-500 HP)	(TONS/YEAR)	0.476	0.444	6.666	.534	1.441
Fire Pump Engine	(LB/HR) max.	0.265	0.246	3.704	0.296	0.802
(1-120 HP)	(TONS/YEAR)	0.002	0.001	0.022	0.002	0.005
Crane Engine	(LB/HR) max.	0.618	0.574	8.642	0.692	1.870
(2-140 HP)	(TONS/YEAR)	0.296	0.276	4.148	0.332	0.898
Emergency Gen. Engine	(LB/HR) max.	0.033	0.031	0.463	0.037	0.100
(1-15 HP)	(TONS/YEAR)	0.000	0.000	0.003	0.000	0.001
TOTALS: (YEAR 1)	(LB/HR) max.	3.120	2.872	43.673	3.495	9.452
	(TONS/YR)	0.774	0.721	10.839	0.868	2.344
TOTALS: (YEAR 2,3&4)	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YEAR)	0.518	0.514	7.728	0.619	1.670
TOTALS: AFTER YEAR 4	(LB/HR) max.	0.716	0.390	6.328	0.506	1.730
	(TONS/YR)	0.042	0.070	1.062	0.085	0.230

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

562-79

FIGURE 4-3a

EXPECTED AIR EMISSIONS

YEARLY TOTALS FOR PLATFORMS GINA AND GILDA

PLATFORM / YEAR		PM	SO_x	NO_x	HC	CO
YEAR 1						
GINA	(LB/HR) max.	1.709	1.590	23.920	1.914	5.177
	(TONS/YR)	0.388	0.361	5.432	0.435	1.176
GILDA	(LB/HR) max.	3.120	2.872	43.673	3.495	9.452
	(TONS/YR)	0.774	0.721	10.839	0.868	2.344
TOTALS	(LB/HR) max.	4.829	4.462	67.593	5.409	14.629
YEAR 1	(TONS/YR)	1.162	1.082	16.271	1.303	3.520
YEAR 2						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YR)	0.518	0.514	7.728	0.619	1.670
TOTALS	(LB/HR) max.	3.567	3.006	45.680	3.655	10.247
YEAR 2	(TONS/YR)	0.539	0.532	8.272	0.642	1.732

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

562-79

FIGURE 4-3b

EXPECTED AIR EMISSIONS

YEARLY TOTALS FOR PLATFORMS GINA AND GILDA

(continued)

PLATFORM / YEAR		PM	SO_X	NO_X	HC	CO
YEAR 3&4						
GINA	(LB/HR) max.	0.046	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YR)	0.518	0.514	7.728	0.619	1.670
TOTALS						
YEAR 3&4	(LB/HR)max.	3.567	3.006	45.680	3.655	10.247
	(TONS/YR)	0.539	0.532	8.272	0.642	1.732
AFTER YEAR 4						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	0.717	0.390	6.328	0.506	1.730
	(TONS/YR)	0.042	0.070	1.062	0.085	0.230
TOTALS AFTER YEAR 4						
	(LB/HR) max.	1.363	0.954	14.816	1.185	3.567
	(TONS/YR)	0.063	0.088	1.606	.108	0.292

Source: Dundas Associates, 1979

The level of emissions will be further reduced upon completion of the four-year drilling program and removal of the 500 HP cementing unit from Gilda.

2) Offshore emissions tend to rapidly spread and dilute as they leave their source. Thus, a facility located on the OCS will have less in the way of localized impacts onshore than an emission source located at the shoreline or further inland.

3) Emissions during the production phase of platform operations are minimal, and will have no significant onshore impacts.

4.3.3 Assessment of Offshore Transportation-Related Emissions

Offshore transportation emissions during the operating phase of Platforms Gina and Gilda are related to movements of crew and supply boats and occasional helicopter use.

a) Platform Gina

1) One 600 HP crew boat, which will operate continuously 100 to 120 hours per month during the project life.

2) One 1000 HP supply boat, which will operate 100 to 150 hours per month during the one-year drilling phase, after which operation will be five to ten hours per month.

3) One helicopter, which will operate ten hours per month during the first year, after which operation will become rare.

Figure 4-4 quantifies expected air pollution emissions from this equipment.

b) Platform Gilda

1) One 600 HP crew boat, which will operate continuously 250 to 400 hours per month during the project life.

FIGURE 4-4

OFFSHORE TRANSPORTATION RELATED AIR EMISSIONS

PLATFORM GINA

(Operational Phase)

Equipment/Emission		AIR EMISSIONS FIRST YEAR				
		P.M.	SO_X	NO_X	HC	CO
Crew Boat	(LB HR) max.	N/A*	N/A	6.984	0.482	1.552
600HP.	(TONS YR)	N/A	N/A	1.920	0.234	0.650
Supply Boat	(LB HR) max.	N/A	N/A	9.000	0.428	2.023
1000 HP.	(TONS YR)	N/A	N/A	2.386	0.937	1.210
Helicopter	(LB HR) max.	0.750	0.540	1.710	1.560	17.100
	(TONS YR)	0.004	0.003	0.009	0.008	0.086
TOTALS	(LB HR) max.	0.750	0.540	17.694	2.470	20.675
	(TONS YR)	0.004	0.003	4.315	1.179	1.946
		AIR EMISSIONS AFTER YEAR ONE				
		P.M.	SO_X	NO_X	HC	CO
TOTALS	(LB HR) max.	N/A	N/A	15.984	0.910	3.575
	(TONS YR)	N/A	N/A	2.079	0.296	0.731

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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2) One 1000 HP supply boat, which will operate 150 to 200 hours per month during the first four years, after which operation will be reduced to 50 to 80 hours per month.

3) One helicopter, which will operate ten hours per month during the first four years, after which operation will be negligible.

Figure 4-5 quantifies expected air pollution emissions from this equipment.

Figures 4-6a and 4-6b totalize the expected transportation-related emissions during operation of Platforms Gina and Gilda.

Assumptions:

Assumptions used in calculating transportation-related emissions are the same as those used in calculating emissions from platform operations.

Mitigating Measures:

1) After the first year of operation, supply boat operations will substantially reduce transportation-related emissions for Platforms Gina and Gilda.

2) Transportation emissions during the operational phase of Platforms Gina and Gilda are minimal, and will have no significant onshore impacts.

4.3.4 Assessment of Onshore Emissions

Air pollution emissions from the onshore facility will result from the operation of the following gas-fired equipment:

a) Three 12×10^6 BTU Heater-Treaters

b) One 1×10^6 BTU Heater-Treater

FIGURE 4-5

OFFSHORE TRANSPORTATION RELATED AIR EMISSIONS

PLATFORM GILDA

(Operational phase)

EQUIPMENT/EMISSION		AIR EMISSIONS YEAR 1, 2, 3 & 4				
		P.M.	SOx	NOx	HC	CO
Crew Boat	(LB/HR) max.	N/A*	N/A	6.984	0.482	1.552
600 HP.	(TONS/YR)	N/A	N/A	6.400	0.780	2.167
Supply Boat	(LB/HR) max.	N/A	N/A	9.000	0.428	2.023
1000 HP.	(TONS/YR)	N/A	N/A	3.181	1.249	1.613
Helicopter	(LB/HR) max.	0.750	0.540	1.710	1.560	17.100
	(TONS/YR)	0.004	0.003	0.009	0.008	0.086
TOTALS	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	0.630	0.580	18.361	2.735	4.756
		AIR EMISSIONS AFTER YEAR 4				
		P.M.	SOx	NOx	HC	CO
TOTALS	(LB/HR) max.	1.476	1.375	31.262	2.308	10.411
	(TONS/YR)	0.518	0.478	14.888	1.852	4.369

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

562-79

FIGURE 4-6a

OFFSHORE TRANSPORTATION RELATED AIR EMISSION

YEARLY TOTALS FOR PLATFORMS GINA & GILDA

(Operational phase)

PLATFORM / YEAR		P.M.	SO_X	NO_X	HC	CO
Year 1						
Gina	(LB/HR) max.	0.750	0.540	17.694	2.470	20.675
	(TONS/YR)	0.004	0.003	4.315	1.179	1.946
Gilda	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	0.630	0.580	18.361	2.735	4.756
TOTALS Year 1	(LB/HR) max.	3.208	2.670	59.307	6.854	46.527
	(TONS/YR)	0.634	0.583	22.676	3.914	6.702
Years 2,3&4						
Gina	(LB/HR) max.	N/A	N/A	15.984	0.910	3.575
	(TONS/YR)	N/A	N/A	2.079	0.296	0.731
Gilda	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	.630	.580	18.361	2.735	4.756
TOTALS Years 2, 3&4	(LB/HR) max.	2.458	2.130	57.597	5.294	29.427
	(TONS/YR)	0.630	0.580	20.440	3.031	5.487

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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RDA

FIGURE 4-6b
(Continued)
OFFSHORE TRANSPORTATION RELATED EMISSIONS
YEARLY TOTALS FOR PLATFORM GINA AND GILDA
(Operational Phase)

PLATFORM / YEAR		P.M.	SO_X	NO_X	HC	CO
AFTER YEAR 4						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	0.374	0.349	15.830	1.073	3.497
	(TONS/YR)	0.338	0.0-4	8.216	1.324	2.929
TOTALS AFTER YEAR 4						
	(LB/HR) max.	1.020	0.913	24.318	1.752	5.334
	(TONS/YR)	0.359	0.952	8.760	1.347	2.991

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979
562-79

Figure 4-7 totalizes air emissions from fuel-fired equipment processing the maximum combined oil and gas production from Platforms Gina and Gilda. Fugitive hydrocarbon emissions at the onshore processing facility are calculated to be less than 1.0 ton per year after control measures have been applied. Impacts from onshore emissions are discussed in Section 4.7.3.

Fuel Conservation Measures:

As a fuel conservation measure, Union will equip the heater-treaters with economizers. The economizers, through utilization of waste heat in the heater-treater flue gases, will reduce fuel consumption by approximately 12% (see Section 2.6 and Exhibit H). Thus, under full-load conditions, a savings of approximately 4.4 million BTU per hour can be realized.

$$\frac{37 \times 10^6 \text{ BTU}}{\text{Hour}} \left| \frac{12}{100} \right. = 4.44 \times 10^6 \text{ BTU/Hour}$$

Say: 4.4×10^6 BTU/Hour (rounded)

This represents an annual total of approximately 37.75 million cubic feet of gas per year that can be made available to the natural gas consumer.

$$\frac{4.4 \times 10^6 \text{ BTU}}{\text{Hour}} \left| \frac{\text{Cu. Ft. Gas}}{1{,}021 \text{ BTU}} \right| \frac{8{,}760 \text{ Hours}}{\text{Year}} =$$

37.75×10^6 Cubic Feet of Gas per Year

This fuel conservation measure will furnish heat to more than 500 homes in the Southern California area annually.

Nitrogen Oxide (NO_X) Control Measures:

In addition to utilizing waste heat recovery, Union will equip each heater-treater with low NO_X burners. It is probable that a 70% reduction in NO_X can be realized (Hydrotek Letter, Exhibit H).

Figure 4-7 quantifies the expected emissions from operation of the onshore facility, using the following assumptions:

FIGURE 4-7

ONSHORE FACILITY AIR EMISSIONS
COMBINED PRODUCTION FROM GINA AND GILDA

EQUIPMENT	PM	SO_X	NO_X	HC	CO
3- $12x10^6$ BTU Treaters					
emission factors (LB/10 cu. ft.)					
lbs./hr.	0.392	0.024	5.406	0.118	0.666
tons/yr.	1.716	0.103	23.680	0.515	2.917
1-$1x10^6$ BTU Treaters					
lbs./hr.	0.011	0.001	0.78	0.003	0.019
tons/yr.	0.048	0.003	0.344	0.014	0.081
TOTALS					
lbs./hr.	0.403	0.025	5.484	0.121	0.685
tons/yr.	1.764	0.106	24.024	0.529	2.998

CALCULATED FROM EPA AP 42 1.4 AND GAS SAMPLE

Source: Dundas Associates, 1979

1) Combined full-capacity production of oil and gas from Platforms Gina and Gilda.

2) Heater-treaters are fired at 100% capacity on a continuous basis.

3) Combustion efficiency with waste heat utilization, 92%.

4) Calculated gross heating value of fuel = 1,021 BTU per cubic foot at S.T.P.

5) EPA AP 42 factors for industrial boilers having more than 10 x 10^6 BTU per hour input.

6) Utilization of low NO_x burner configurations.

7) Gas contains no hydrogen sulfide (see gas and crude oil analyses in Exhibit I).

Mitigating Measures:

1) Utilization of waste heat will recover approximately 37.75 million cubic feet of natural gas per year for consumer use.

2) Utilization of low NO_x burner configurations will reduce NO_x production by an estimated 70%.

3) Joint use of onshore facility will minimize onshore space requirements for treatment of gas and oil produced from Platforms Gina and Gilda.

4) Landscaping of onshore facility will conform with state and local specifications.

4.4 Physical Oceanography

A detailed discussion of design waves, design stormwater level, wave force profiles, normal waves, currents, water temperature and salinity, is

contained in the report, "Design and Seasonal Waves, Currents, and Weather Conditions for OCS P-0216, Santa Barbara Channel, California", prepared for Union by Intersea Research Corporation, dated June 11, 1979 (Ref. 30). A copy of this report is available for inspection at Union's Ventura office.

4.4.1 Effect of Sea Conditions

The effect of sea temperatures, currents, sea state, water depth, and tides in the Santa Barbara Channel will directly affect design criteria for the proposed action.

4.4.2 Effect on Water Quality

Quantities of platform discharges by phases are tabulated in Figure 4-8 on a daily and project cumulative basis. In the event of nonconforming discharge, Union will take immediate corrective action to prevent adverse environmental impacts or cease operation until corrective action is implemented.

Mitigating Measures:

Careful attention to maintenance of equipment and systems:

1) Mud monitoring system.
2) Produced water and sewage waste system.
3) Spill containment and onshore disposal of any environmentally toxic materials.

4.5 Impacts on the Area

4.5.1 Impacts on Commercial Fishing

The site of the proposed platform is in an area heavily exploited by the commercial fishing industry. Consequently, construction of the proposed platform and subsea pipeline can have some negative impacts. During the initial six- to eight-week construction period, fishing boats will be impacted by the concentration of activity within the immediate area of the site. This area may vary, depending upon the phase of construction, but would probably not exceed 150 acres at any one time. After construction, the occupied area will diminish to approximately two acres.

FIGURE 4-8

ESTIMATED WASTE DISCHARGES TO OCEAN WATERS

PLATFORM GILDA

Phase	Daily	Duration	Cummulative
Construction			
Treated Sewage	25 bbls.	2 mos.	1,500 bbls.
Treated Waste Water	300 bbls.	2 mos.	
Drilling			
Treated Sewage	18 bbls.	48 mos.	26,000 bbls
Treated Waste Water	40 bbls.	48 mos.	58,000 bbls.
Drilling Muds	107 bbls.	48 mos.	156,500 bbls
Drill Cuttings	30 bbls	48 mos.	44,000 bbls
Operation			
Treated Sewage	3 bbls.	-----	-------
Treated Waste Water	4 bbls.	-----	-------

Not include:

Minimum Chlorine Residual
Minimum Oil Residual

Source: Dundas Associates, 1979

Short-term impacts due to construction activities would be moderate, since the area of construction will occupy only a fraction of the area used during trawling and other fishing activities. After construction, the area to be occupied by the platform will be substantially reduced. Fishermen and marine scientists alike recognize that marine life flourishes near artificial structures in ocean waters. Studies by the Institute of Marine Resources, University of California, have concluded from a study of Platforms Hilda and Hazel in the Santa Barbara Channel that platforms support a highly diverse marine community that contributes substantially to an increase in fisheries near the platform locations. It can be concluded, therefore, that long-range benefits can outweigh any disruptance due to the construction of the proposed platform and subsea pipeline (Simpson, 1977, Ref. 25).

Mitigating measures to be taken to alleviate possible navigational hazards include the installation of marker lights on the platform and an audible alarm during periods of restricted visibility.

4.5.2 Impacts on Shipping

The proposed platform site does not coincide with any established shipping lanes; therefore, no impacts to the shipping industry are anticipated. As stated in Section 4.5.1, Impacts on Commercial Fishing, navigational lights and fog horns will be installed on the proposed platform. These lights and other aids will have sufficient visibility and audibility to virtually preclude any likelihood of a collision.

4.5.3 Impacts on Military Uses

Impacts on military uses of the area around the proposed platform are largely indeterminable. At present, future military uses of this area are unannounced. Therefore, impacts cannot be accurately predicted with any degree of certainty.

Mitigating measures include informing all military commanders in the area of the proposed offshore project.

4.5.4 Impacts on Small Craft Use

The proposed Platform Gilda lies within an area used extensively by privately owned small craft. The highest incidence of recreational boating is on the weekends and extended holiday weekends. By virtue of the relatively small area of the channel to be occupied during construction and upon completion of the platform, adverse impacts upon the recreational boating community will be minimal. Even with the increased activity of supply and crew boat traffic in the area, the platform will have minimal adverse impacts upon recreational boating.

As a mitigant for the small craft operator, the platform will serve as a reference point during hours of darkness or during inclement weather. Since most small craft operators use the Santa Barbara Channel during daylight hours, the navigational hazard potential of the platform is minimal.

4.5.5 Impacts on Transitory Fauna

The specific sites of the proposed platform, the pipeline route or onshore facility, are not located near any known rookeries, haulout areas, or breeding areas. The closest environmentally sensitive area is McGrath State Park, a nature preserve located approximately one mile north of the Mandalay Beach onshore facility. Impacts resulting from the proposed construction and operational activities to transitory fauna are expected to be negligible.

As a mitigation, construction activities will be of short duration, and replacement of disturbed vegetation at the proposed onshore facility will favor return of any transitory fauna that may have been displaced.

4.5.6 Mariculture/Mitigation

Mariculture at the present time is primarily limited to kelp harvesting, although several pilot programs have been initiated for the culturing of abalone-seed and other species having high commercial value. Some of these pilot programs have been successfully conducted beneath existing platforms, which have created controlled environments for the protective culturing of sea life.

OCS activities, except for possible oil spills, will have little or no adverse impacts upon mariculture operations. The platform, subsea pipelines, and onshore facility are not located within any area containing kelp beds or natural biological resources.

Kelp is an extremely hardy plant; impacts from uncontrolled oil spills that would kill other plant species actually have little or no effect upon the kelp. This resiliency is clearly illustrated in the continued proliferation of the kelp despite the frequent natural oil seeps that occur throughout the Santa Barbara Channel. Thus, natural mitigation is provided through the hardiness of the kelp plant itself, and the fact that no kelp beds exist near the platform site.

4.5.7 Impacts on Environmentally Sensitive Areas

A supplemental report to the E/R for the Hueneme Offshore Platform (Gina) is available upon request from Union. This supplement describes in detail the impacts and mitigating measures on the environmentally sensitive areas of the Santa Barbara Channel (Dundas Associates, 1979, Ref. 29).

4.5.8 Impacts on Cultural Resources

The coastal areas of the Santa Barbara Channel, once inhabited by the Chumash Indians, have yielded little in the way of artifacts of this once thriving culture. The ravages of time, erosion, and various exploitive activities have probably destroyed the majority of these resources. Underwater surveys (Fairchild, 1977) using sophisticated electronic search devices, have found little or no artifacts of significance in offshore areas. Onshore artifacts have been found, but in no significant concentration. This paucity of cultural resource evidence does not, however, preclude the existence or non-existence of potential artifact discoveries. A site-specific cultural resource survey is currently being conducted by Dames and Moore. Information from this survey will be provided following its completion.

Mitigations are:

1) The offshore site does not lie within the general area designated by BLM as having probability for aboriginal marine sites.

2) Near-shore and onshore sites lie within the probability range of aboriginal sites. Therefore, reasonable care will be exercised in making near-shore and onshore excavations.

4.6 Impacts on Fauna

4.6.1 Impacts on Marine Mammals

The Santa Barbara Channel is a significant area in terms of possible impacts on marine mammals. All of the northern Channel Islands (with the exception of Anacapa) have pinneped breeding areas; all have haulout areas. Dominant coastal haulout areas are at Mugu Marsh, Carpinteria, El Estero Marsh, and Goleta Slough. The Santa Barbara Channel also serves as a major migration corridor for cetaceans.

It has been reliably established by Scripps Institute, the Human-Dolphin Foundation, and the U.S. Navy that members of the cetacean family (whales and porpoises) communicate by a series of audible sounds and navigate by emitting high frequency sounds which are reflected from distant objects. Simpson (University of California) reports: "Of the four species of marine mammals seen, California sea lions were the most frequent visitors to the platforms. In April, the investigators witnessed part of the annual migration of the California gray whale - several of these large animals were seen swimming north between the platforms and shore." (Ref. 25). Despite postulations that OCS activities may disturb the navigational and communication abilities of this mammalian group, there is no substantiation for these premises.

The possible result from an oil spill remains the largest single threat to marine mammals that might occur as a result of OCS activities.

A summary of probable and/or possible impacts upon marine mammals is included in the Dundas Associates Report, 1979, (Ref. 29).

4.6.2 Impacts on Marine-Associated Birds

"Oil spills would cause the most significant impacts on marine-associated birds. Impacts upon the shorebird and coastalbird populations and their habitats could occur from the effects of both acute and chronic oil spills, the impacts of increased human disturbance and habitat loss, and the potential for increased contamination of the ecosystem and the bird's food supplies." (BLM E/A, 1979, Ref. 3).

The proposed action is not within proximity to any essential feeding, nesting, and breeding areas for resident or migrant sea birds. Many species of pelagic birds, including the California brown pelican and Brandt's cormorants, are frequent visitors at platforms where the abundance of marine life affords a source for food.

4.6.3 Accidents

Accidents include: a) spills, b) personnel injuries, and c) loss of equipment.

a) Spills can vary considerably. They can include spills of fuel oil, crude oil, or other compounds considered harmful to the environment. Mitigating measures which are employed to contain spills are described in detail in Union's Contingency Plan.

b) Personnel injuries are mitigated by providing safe working conditions and qualified equipment operators. When major injuries do occur, prompt evacuation of injured personnel is made by the most expedient mode of transportation. Union's Contingency Plan lists available doctors and hospitals available for immediate response.

c) All crew boats, service boats and supply boats are certified by USCG and are subject to routine inspection. Aircraft are FAA

certified, and are also subject to regular inspections and maintenance programs.

4.7 Additional Onshore Impacts

4.7.1 Socio-Economic Impacts

a) Employment. Impacts resulting from additional labor requirements will result in approximately five families being added to the Oxnard-Ventura area. Other labor sources will be obtainable from existing labor pools.

b) Effect on local population and industry. Little or no social or economic impacts would be felt by local population centers. Minor impacts upon local industry would be reflected in additional goods and services.

1) Availability of community services: No additional community services will be required.

2) Public opinion: No sampling of public opinion relating to this project has been made.

3) Competition for coastal resources: A short-term increase in competition for dock facilities may impact Port Hueneme Harbor during the construction and drilling phases of this project.

4.7.2 Environmental Impacts

a) Aesthetics. The presence of a man-made structure and construction activities in an otherwise aesthetically pleasing environment will adversely impact some segments of the population. Mitigating measures will be to minimize overall structure height of the platform and to landscape the surrounding Mandalay Park Development Plan.

b) Terrestrial Flora. Vegetation near the onshore facility consists principally of coastal chaparrel and scrub sage. A biological survey of the proposed site has been made. A detailed report of this survey will be provided when it becomes available. Mitigating measures will include:

1) Re-contouring the construction easement area to conform with its original contour.

2) Replacement of disturbed vegetation.

c) Coastal Zone Management Act and California Coastal Commission Acts. The lessee and his contractors will be fully cognizant of the goals and policies of CZMA and CCC in protecting the environment.

4.7.3 Status of Air Quality Permit Filing

An application for Authority-To-Construct has been filed with the Ventura County APCD and is currently under evaluation. Onshore emissions will be allocated to the project according to provisions of the Air Quality Management Plan and Ventura County APCD new source review rules. Following review by CARB and EPA, the permit will be issued.

Air Quality impacts from the proposed platform will be temporary in nature, since the major source of power at the platform will be electricity. Primary impacts will occur during construction from support vessels and other construction equipment at the platform and onshore sites. Due to the short time period required for construction the associated impacts are negligible.

FIGURE 4-1

AIR EMISSIONS

OFFSHORE PLATFORM GINA

Equipment/Emissions		P.M.	SO_x	NO_x	HC	CO
Cementing Unit	(LB/HR) max.	1.102	1.026	15.432	1.235	3.340
(1-500 HP)	(TONS/YEAR)	0.238	0.222	3.333	0.267	0.721
Fire Pump Engine	(LB/HR) max.	0.265	0.246	3.704	0.296	0.802
(1-120 HP)	(TONS/YEAR)	0.002	0.001	0.022	0.002	0.005
Crane Engine	(LB/HR) max.	0.309	0.287	4.321	0.346	0.935
(1-140 HP)	(TONS/YEAR)	0.148	0.138	2.074	0.166	0.449
Emergency Gen. Engine	(LB/HR) max.	0.033	0.031	0.463	0.037	0.100
(1-15 HP)	(TONS/YEAR)	0.000	0.000	0.003	0.000	0.001
TOTAL	(LB/HR) max.	1.709	1.590	23.920	1.914	5.177
	(TONS/YEAR)	0.388	0.361	5.432	0.435	1.176

AIR POLLUTANT EMISSIONS AFTER THE 1ST YEAR

		P.M.	SO_x	NO_x	HC	CO
TOTAL	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YEAR)	0.021	0.018	0.544	0.023	0.062

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-2

AIR EMISSIONS

OFFSHORE PLATFORM GILDA

Equipment/Emissions		P.M.	SO_X	NO_X	HC	CO
Cementing Unit (LB/HR) max.		2.204	2.052	30.864	2.470	6.680
(1-500 HP)	(TONS/YEAR)	0.476	0.444	6.666	.534	1.441
Fire Pump Engine (LB/HR) max.		0.265	0.246	3.704	0.296	0.802
(1-120 HP)	(TONS/YEAR)	0.002	0.001	0.022	0.002	0.005
Crane Engine (LB/HR) max.		0.618	0.574	8.642	0.692	1.870
(2-140 HP)	(TONS/YEAR)	0.296	0.276	4.148	0.332	0.898
Emergency Gen. Engine (LB/HR) max.		0.033	0.031	0.463	0.037	0.100
(1-15 HP)	(TONS/YEAR)	0.000	0.000	0.003	0.000	0.001
TOTALS: (YEAR 1)	(LB/HR) max.	3.120	2.872	43.673	3.495	9.452
	(TONS/YR)	0.774	0.721	10.839	0.868	2.344
TOTALS: (YEAR 2,3&4)	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YEAR)	0.518	0.514	7.728	0.619	1.670
TOTALS: AFTER YEAR 4	(LB/HR) max.	0.716	0.390	6.328	0.506	1.730
	(TONS/YR)	0.042	0.070	1.062	0.085	0.230

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-3a

EXPECTED AIR EMISSIONS

YEARLY TOTALS FOR PLATFORMS GINA AND GILDA

PLATFORM YEAR		PM	SO_X	NO_X	HC	CO
YEAR 1						
GINA	(LB/HR) max.	1.709	1.590	23.920	1.914	5.177
	(TONS/YR)	0.388	0.361	5.432	0.435	1.176
GILDA	(LB/HR) max.	3.120	2.872	43.673	3.495	9.452
	(TONS/YR)	0.774	0.721	10.839	0.868	2.344
TOTALS	(LB/HR) max.	4.829	4.462	67.593	5.409	14.629
YEAR 1	(TONS/YR)	1.162	1.082	16.271	1.303	3.520
YEAR 2						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YR)	0.518	0.514	7.728	0.619	1.670
TOTALS	(LB/HR) max.	3.567	3.006	45.680	3.655	10.247
YEAR 2	(TONS/YR)	0.539	0.532	8.272	0.642	1.732

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-3b

EXPECTED AIR EMISSIONS

YEARLY TOTALS FOR PLATFORMS GINA AND GILDA

(continued)

PLATFORM / YEAR		PM	SO_X	NO_X	HC	CO
YEAR 3&4						
GINA	(LB/HR) max.	0.046	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	2.921	2.442	37.192	2.976	8.410
	(TONS/YR)	0.518	0.514	7.728	0.619	1.670
TOTALS						
YEAR 3&4	(LB/HR)max.	3.567	3.006	45.680	3.655	10.247
	(TONS/YR)	0.539	0.532	8.272	0.642	1.732
AFTER YEAR 4						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	0.717	0.390	6.328	0.506	1.730
	(TONS/YR)	0.042	0.070	1.062	0.085	0.230
TOTALS AFTER YEAR 4						
	(LB/HR) max.	1.363	0.954	14.816	1.185	3.567
	(TONS/YR)	0.063	0.088	1.606	.108	0.292

Source: Dundas Associates, 1979

FIGURE 4-4

OFFSHORE TRANSPORTATION RELATED AIR EMISSIONS

PLATFORM GINA

(Operational Phase)

Equipment/Emission		AIR EMISSIONS FIRST YEAR				
		P.M.	SO_X	NO_X	HC	CO
Crew Boat	(LB HR) max.	N/A*	N/A	6.984	0.482	1.552
600HP.	(TONS YR)	N/A	N/A	1.920	0.234	0.650
Supply Boat	(LB HR) max.	N/A	N/A	9.000	0.428	2.023
1000 HP.	(TONS YR)	N/A	N/A	2.386	0.937	1.210
Helicopter	(LB HR) max.	0.750	0.540	1.710	1.560	17.100
	(TONS YR)	0.004	0.003	0.009	0.008	0.086
TOTALS	(LB HR) max.	0.750	0.540	17.694	2.470	20.675
	(TONS YR)	0.004	0.003	4.315	1.179	1.946
		AIR EMISSIONS AFTER YEAR ONE				
		P.M.	SO_X	NO_X	HC	CO
TOTALS	(LB HR) max.	N/A	N/A	15.984	0.910	3.575
	(TONS YR)	N/A	N/A	2.079	0.296	0.731

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-5

OFFSHORE TRANSPORTATION RELATED AIR EMISSIONS

PLATFORM GILDA

(Operational phase)

EQUIPMENT/EMISSION		AIR EMISSIONS YEAR 1, 2, 3 & 4				
		P.M.	SOX	NOX	HC	CO
Crew Boat	(LB/HR) max.	N/A*	N/A	6.984	0.482	1.552
600 HP.	(TONS/YR)	N/A	N/A	6.400	0.780	2.167
Supply Boat	(LB/HR) max.	N/A	N/A	9.000	0.428	2.023
1000 HP.	(TONS/YR)	N/A	N/A	3.181	1.249	1.613
Helicopter	(LB/HR) max.	0.750	0.540	1.710	1.560	17.100
	(TONS/YR)	0.004	0.003	0.009	0.008	0.086
TOTALS	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	0.630	0.580	18.361	2.735	4.756
		AIR EMISSIONS AFTER YEAR 4				
		P.M.	SOX	NOX	HC	CO
TOTALS	(LB/HR) max.	1.476	1.375	31.262	2.308	10.411
	(TONS/YR)	0.518	0.478	14.888	1.852	4.369

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-6a

OFFSHORE TRANSPORTATION RELATED AIR EMISSION

YEARLY TOTALS FOR PLATFORMS GINA & GILDA

(Operational phase)

PLATFORM / YEAR		P.M.	SO_X	NO_X	HC	CO
Year 1						
Gina	(LB/HR) max.	0.750	0.540	17.694	2.470	20.675
	(TONS/YR)	0.004	0.003	4.315	1.179	1.946
Gilda	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	0.630	0.580	18.361	2.735	4.756
TOTALS	(LB/HR) max.	3.208	2.670	59.307	6.854	46.527
Year 1	(TONS/YR)	0.634	0.583	22.676	3.914	6.702
Years 2,3&4						
Gina	(LB/HR) max.	N/A	N/A	15.984	0.910	3.575
	(TONS/YR)	N/A	N/A	2.079	0.296	0.731
Gilda	(LB/HR) max.	2.458	2.130	41.613	4.384	25.852
	(TONS/YR)	.630	.580	18.361	2.735	4.756
TOTALS						
Years 2, 3&4	(LB/HR) max.	2.458	2.130	57.597	5.294	29.427
	(TONS/YR)	0.630	0.580	20.440	3.031	5.487

*Factors Not Available

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979

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FIGURE 4-6b
(Continued)
OFFSHORE TRANSPORTATION RELATED EMISSIONS
YEARLY TOTALS FOR PLATFORM GINA AND GILDA
(Operational Phase)

PLATFORM / YEAR		P.M.	SO_X	NO_X	HC	CO
AFTER YEAR 4						
GINA	(LB/HR) max.	0.646	0.564	8.488	0.679	1.837
	(TONS/YR)	0.021	0.018	0.544	0.023	0.062
GILDA	(LB/HR) max.	0.374	0.349	15.830	1.073	3.497
	(TONS/YR)	0.338	0.0-4	8.216	1.324	2.929
TOTALS AFTER YEAR 4						
	(LB/HR) max.	1.020	0.913	24.318	1.752	5.334
	(TONS/YR)	0.359	0.952	8.760	1.347	2.991

Calculated from EPA-AP 42 Appendix "C"

Source: Dundas Associates, 1979
562-79

RDA

FIGURE 4-7

ONSHORE FACILITY AIR EMISSIONS
COMBINED PRODUCTION FROM GINA AND GILDA

EQUIPMENT	PM	SO_X	NO_X	HC	CO
3- $12x10^6$ BTU Treaters					
emission factors (LB/10 cu. ft.)					
lbs./hr.	0.392	0.024	5.406	0.118	0.666
tons/yr.	1.716	0.103	23.680	0.515	2.917
1-$1x10^6$ BTU Treaters					
lbs./hr.	0.011	0.001	0.78	0.003	0.019
tons/yr.	0.048	0.003	0.344	0.014	0.081
TOTALS					
lbs./hr.	0.403	0.025	5.484	0.121	0.685
tons/yr.	1.764	0.106	24.024	0.529	2.998

CALCULATED FROM EPA AP 42 1.4 AND GAS SAMPLE

Source: Dundas Associates, 1979

FIGURE 4-8

ESTIMATED WASTE DISCHARGES TO OCEAN WATERS

PLATFORM GILDA

Phase	Daily	Duration	Cummulative
Construction			
Treated Sewage	25 bbls.	2 mos.	1,500 bbls.
Treated Waste Water	300 bbls.	2 mos.	
Drilling			
Treated Sewage	18 bbls.	48 mos.	26,000 bbls
Treated Waste Water	40 bbls.	48 mos.	58,000 bbls.
Drilling Muds	107 bbls.	48 mos.	156,500 bbls
Drill Cuttings	30 bbls	48 mos.	44,000 bbls
Operation			
Treated Sewage	3 bbls.	-----	-------
Treated Waste Water	4 bbls.	-----	-------
Not include:			
Minimum Chlorine Residual			
Minimum Oil Residual			

RDA

Source: Dundas Associates, 1979

SECTION 5

ALTERNATIVES TO THE PROPOSED ACTION

5.1 Alternatives to the Offshore Platform

The alternatives to the proposed offshore drilling and producing platform are:

- Directional drilling from shore sites
- Subsea and subterranean drilling chambers
- Individual subsea completions
- Underwater platforms
- Floating or semi-submersible drilling/production on vessels

Not all of these alternatives are appropriate for the proposed project. However, each alternative will be discussed.

5.1.1 Directional Drilling from Shore Sites

The proposed project site lies approximately 9.9 miles offshore, a horizontal distance of 52,000 feet. Assuming a drilling depth of 12,000 feet, the drilling angle would be less than 30 degrees from horizontal, and the well bore would exceed 54,000 feet. Drilling under these conditions is beyond present known techniques.

5.1.2 Subsea or Subterranean Drilling Chambers

The construction of subsea or subterranean drilling chambers is an alternative to platform drilling. This alternative consists of an underground drilling chamber connected to shore by an underground tunnel. A preliminary study be Esso Production Research Company was conducted in 1968 to determine the feasibility of such an alternative. The final Environmental Statement for the proposed development of the Santa Ynez Unit,

Santa Barbara Channel, prepared by U.S. Geological Survey, concluded that: "These methods (subsea or subterranean drilling chambers) might become alternatives at some unknown future time, but at the present time, technological feasibility rules them out as viable alternatives to the use of platforms to develop oil and gas fields." (USGS, 1976, Ref. 19)

5.1.3 Individual Subsea Completions

This method of drilling utilizes a mobile-floating or jack-up type of drill ship, with the wellhead equipment located beneath the surface of the water, generally on the sea floor. Individual wells are connected to a nearby platform or other surface production facility. This alternative might be viable, where the project would require multiple drill platforms, by reducing the number of platforms to one. This system, because of its high cost for well maintenance, would necessitate early well cut-off and early abandonment of the well(s). This would cause waste of a valuable resource and would not be in the public interest. This would be considered an adverse impact.

5.1.4 Clustered Multi-well Subsea Completions

This alternative entails drilling multiple wells using a template placed upon the sea floor. A floating or semi-submersible drill ship is placed above the template and wells are directionally drilled into reservoirs. Conductors from these wells are minifolded into a common pipeline for transport of the produced hydrocarbon to a nearby platform for processing. It has been concluded in the USGS report, Final Environmental Statement for the Santa Ynez Unit (Ref. 20), that: "Present submerged production systems require a nearby surface facility (within three miles) to process production."

5.1.5 Underwater Platforms

Underwater platforms would require some form of above-sea access. This type of facility could create hazardous conditions, primarily due to

the ocean depth at the proposed project site. The underwater platform has the disadvantage of markedly increasing costs without compensating environmental or economic advantages.

5.1.6 Floating or Semi-Submersible Drilling Production Vessel

The floating-vessel concept does not offer any environmental advantages over the conventional platform at the ocean depth of the proposed action. In fact, it introduces additional safety risks during adverse weather conditions and tends to increase spill hazard potential.

5.2 Alternatives to Onshore Treatment Facilities

The alternative to onshore treatment facilities is offshore treatment of the produced hydrocarbons and separation of produced water. Offshore treatment facilities have two distinctive adverse environmental impacts:

1) A substantially larger platform or separate treatment platform would be required to contain the processing equipment.

2) Increased energy consumption without compensating environmental or economic benefits.

A more detailed discussion of offshore treatment facilities is addressed in the Hueneme Offshore Platform and Onshore Facility E/R, Dundas Associates, 1978 (Ref. 13).

5.3 Pipeline Route and Onshore Treating Facility

Oil, gas, and produced water from Platforms Gina and Gilda will be transported onshore through separate pipelines. Differing well pressure and oil viscosities, which dynamically affect fluid pumping characteristics, preclude commingling of the production from each platform prior to onshore processing. For this reason, oil, gas, and produced water from Platform Gina will be transported onshore through a 10.75 inch diameter pipeline. Again, for reason of optimizing pumping characteristics, oil produced on Platform Gilda will be separated from the solution gas and transported

onshore through a 12.75 inch diameter pipeline. The separated gas would be transported onshore in a 10.75 inch diameter pipeline in parallel with the oil/water pipeline. A separate 6.625 inch diameter pipeline will return the treated water to each platform for well reinjection. The return water pipeline will parallel the route of the production pipelines.

Any pipeline route or treatment facility which causes least disruption to the environment will offer the most viable alternative. For the same reason, it will offer the least overall evaluated cost for installation and operation. A proposed pipeline route and three alternative routes have been considered.

a) Proposed Mandalay Beach Site

b) Alternate No. 1 - East Mandalay

c) Alternate No. 2 - Union Terminal

d) Alternate No. 3 - Ormond Beach

Of the above four options, the Union terminal at Ventura is the only existing site. See Section 5.3.5 for consistency alternatives review.

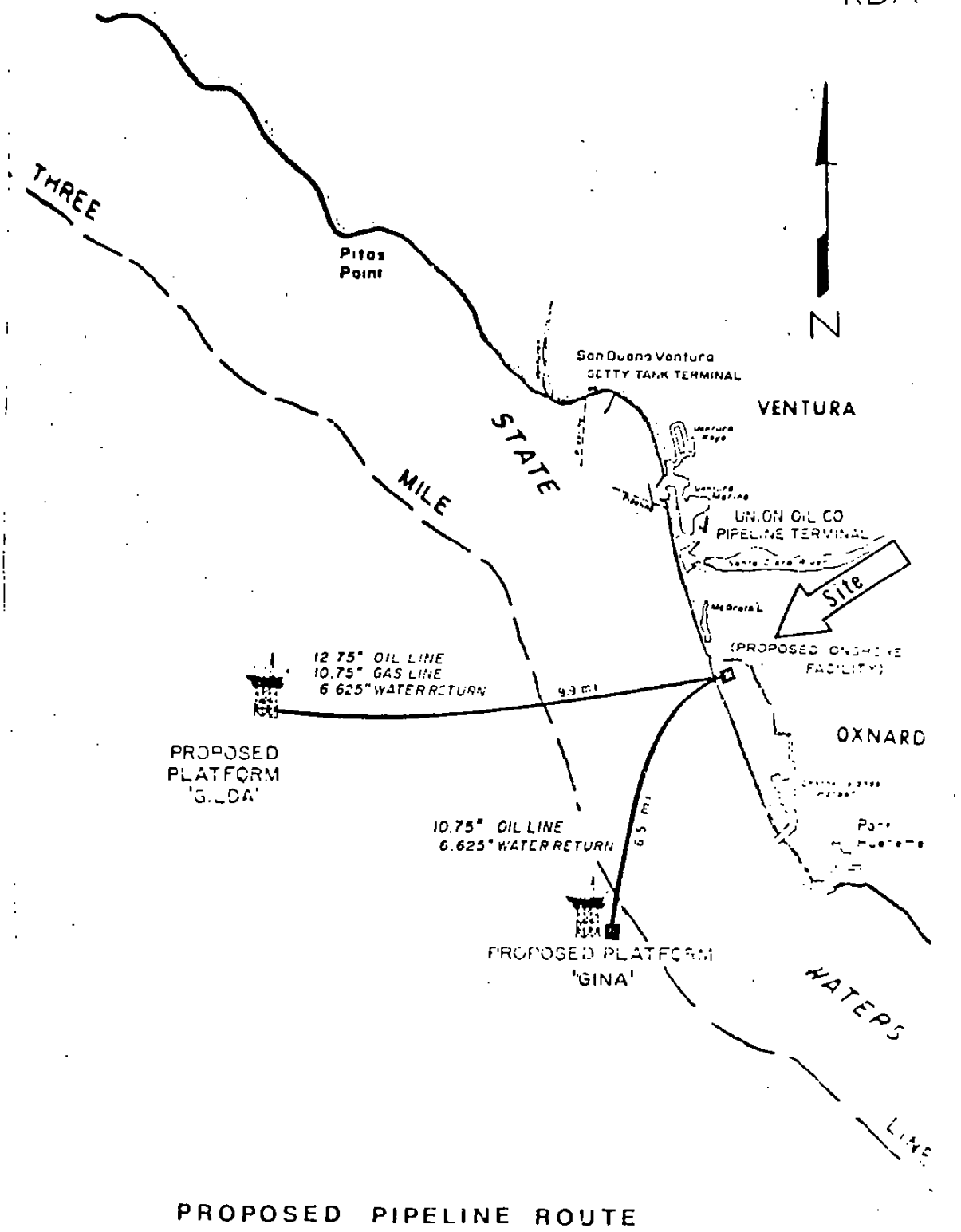
5.3.1 Proposed Pipeline Route and Onshore Treating Facility

The proposed (preferred) pipeline route and onshore facility is shown in Figure 5-1. The pipelines would come onshore at Mandalay Beach. The proposed treatment facility would be located on a 1.8 acre site immediately south and adjacent to the Mandalay Steam Station. This site, which is described in previous sections of this report, offers the following advantages:

1) Lowest energy consumption of all sites studied.

2) Easy access to existing oil and gas transmission lines.

3) Least disruptive site to the environment.



PROPOSED PIPELINE ROUTE

Figure 5-1

Source: Dundas Associates

4) The site is inconspicuous.

5.3.2 Alternate No. 1 - East Mandalay Site

Alternate No. 1 pipeline route and onshore facility is shown in Figure 5-2. The pipelines would come onshore in the same general location as the preferred route. Onshore, the pipelines would parallel the south property line of the Mandalay Steam Station, pass beneath Harbor Boulevard and terminate at the Alternate No. 1 site .75 miles onshore and adjacent to the west bank of the Edison Canal and the future extension of Teal Club Road.

This alternate site has the following comparative disadvantages:

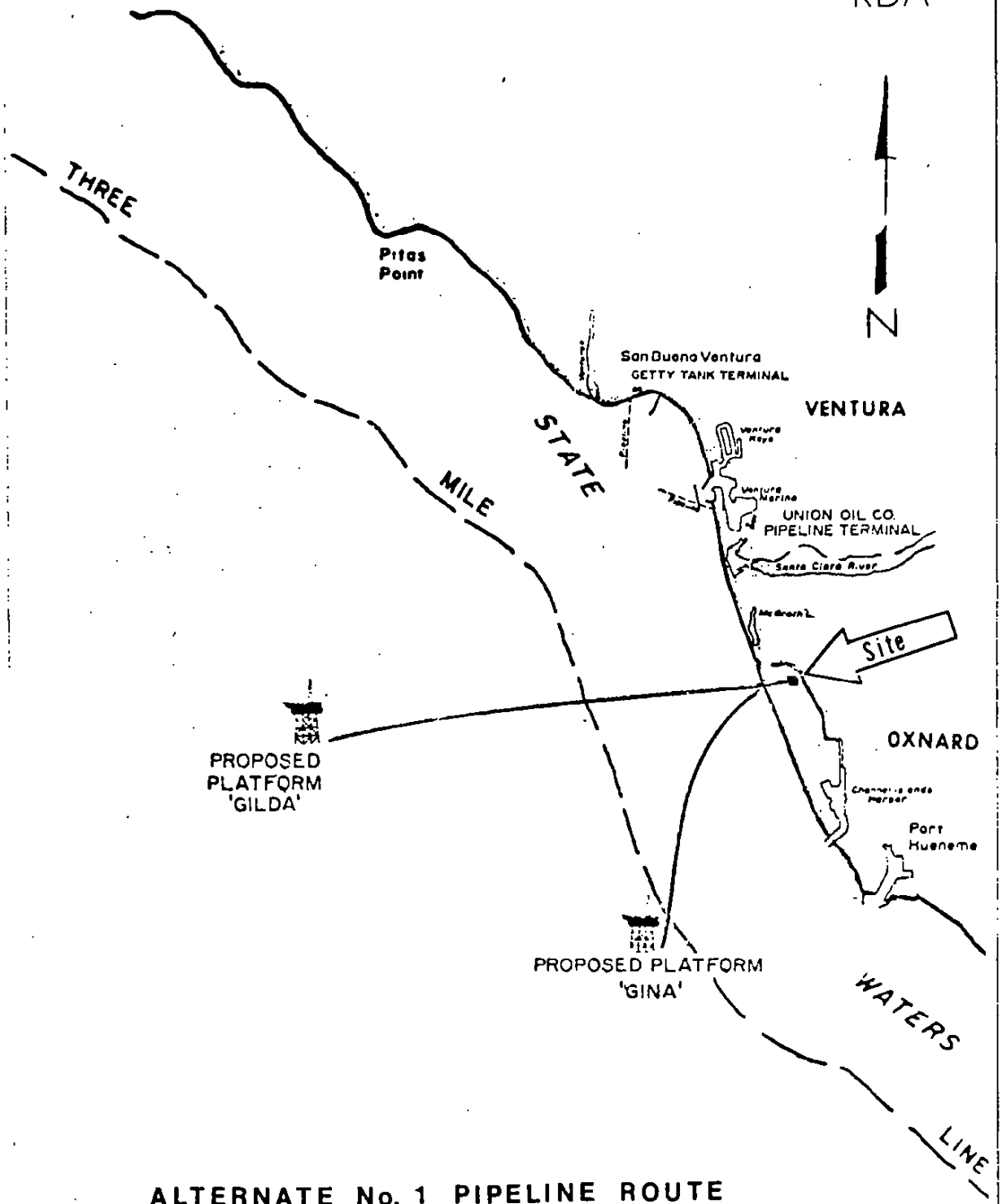
1) Deep tunneling would be required under Harbor Boulevard to prevent interference with existing utilities (sewer and water lines).

2) Increased energy requirements; attributed to increased pipeline lengths. The estimated pumping resistance is equivalent to adding approximately five additional miles of pipeline.

3) The site may have future adverse aesthetic impacts as the area becomes more developed.

5.3.3 Alternate No. 2 - Union Terminal

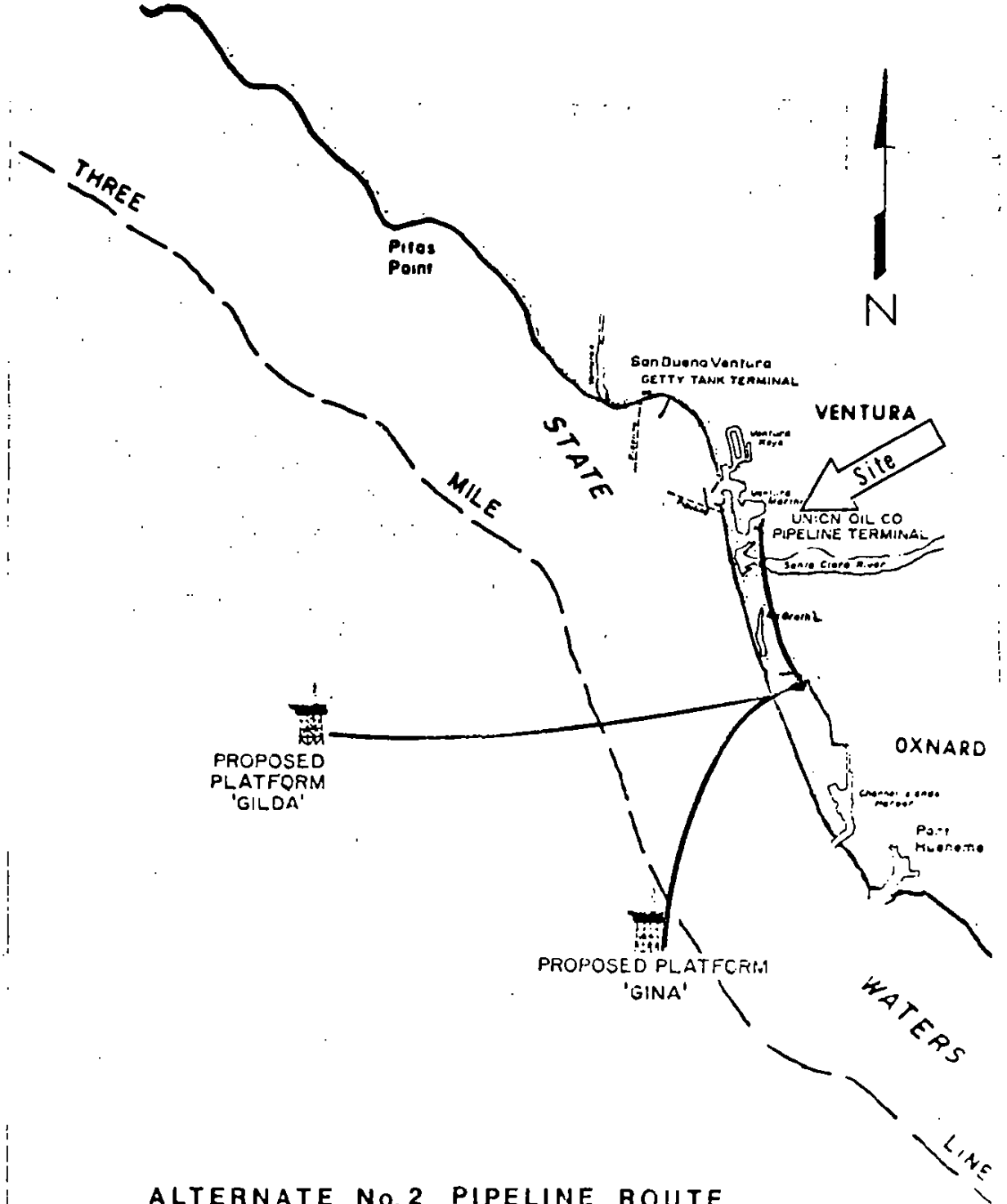
The existing Union Oil Company Marine Loading Terminal is located immediately west of Harbor Boulevard and is bordered on the north by Spinnaker Drive (Ventura Harbor) and to the south by the City of San Buenaventura sewage disposal plant (see Figure 5-3). The pipeline route would come onshore north of Mandalay Steam Station and proceed northeasterly to Harbor Boulevard. Paralleling Harbor Boulevard and McGrath State Park, the pipelines would continue northward, across the bridge over the upper Santa Clara River Estuary, and then to the Union Marine Loading Terminal. The onshore distance for this pipeline route is approximately 2.3 miles.



ALTERNATE No. 1 PIPELINE ROUTE
EAST MANDALAY BEACH SITE

Figure 5-2

Source: Dundas Associates



ALTERNATE No. 2 PIPELINE ROUTE
UNION TERMINAL

Figure 5-3

Source: Dundas Associates

Alternate No. 2 has the following comparative disadvantages:

1) The pipeline route would border a state preserve and pass over (or through) the upper Santa Clara River Estuary, a critically sensitive habitat for rare and endangered bird species.

2) Increased pumping energy requirements attributed to increased pipeline lengths. The estimated additional pumping resistance is equivalent to 16 additional miles of pipeline.

3) This alternate route would involve extensive construction activity along Harbor Boulevard for approximately six weeks.

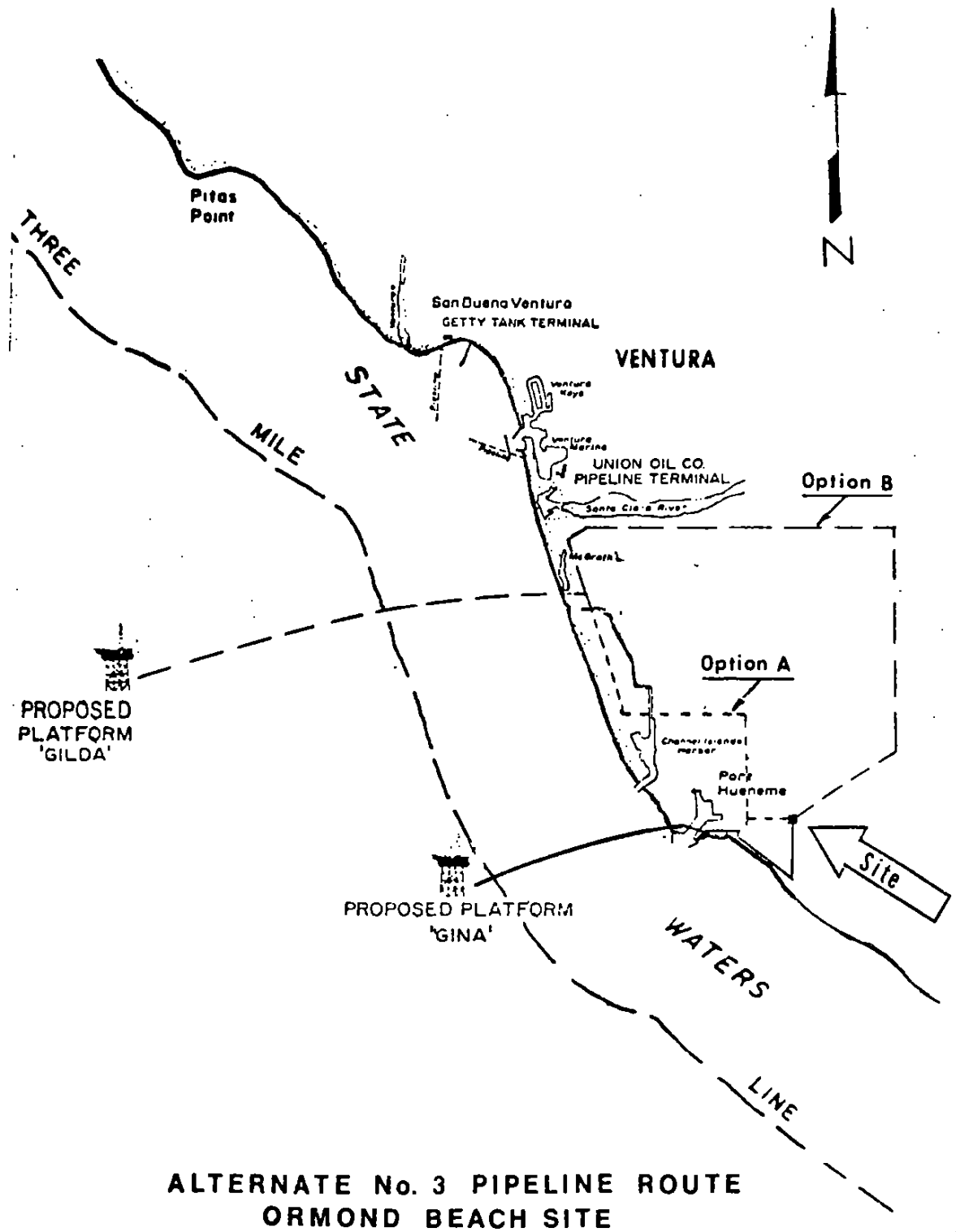
4) Disruption of a sensitive habitat and traffic on Harbor Boulevard due to construction activities, and increased operating costs are disproportionate to any corresponding benefits.

5.3.4 Alternate No. 3 - Ormond Beach

The Ormond Beach site is located within Oxnard, near the junction of Perkins Road and McWane Boulevard, adjacent to the Western Kraft Paper Company properties. Two pipeline routes have been considered:

Option A: Option A is an urban route, which alternately passes through the municipalities of Oxnard, Port Hueneme, and Oxnard. Production from Gilda comes onshore at the proposed Mandalay Beach site (see Figure 5-4). Moving southward along Harbor Boulevard, the pipeline turns east at Channel Islands Boulevard to Ventura Road, where it again proceeds southward along Hueneme Road to the site location. The distance covered by the Gilda pipeline route of this option is approximately eight miles.

Production from Platform Gina would come onshore at LaGanelle Park and would proceed in an easterly direction, crossing under the channel entry to Port Hueneme Harbor, after which it would parallel Hueneme Road to Ventura Road. At Ventura Road, the pipeline route would proceed southward,



ALTERNATE No. 3 PIPELINE ROUTE
ORMOND BEACH SITE

Figure 5-4

Source: Dundas Associates

crossing under the Ventura County Railroad right-of-way, where it would parallel Surfside Drive to Perkins Road. The pipeline route would then turn northward to the Ormond Beach site. The Gina onshore pipeline route would be approximately 12.5 miles in length.

Alternate No. 3, Option A, has the following disadvantages when compared with the proposed route:

1) Substantially increased pumping energy requirements. The estimated increased pumping energy will be equivalent to at least 30 additional miles of pipeline.

2) In moving the oil from Gilda over this route, the probability of requiring supplementary heat to pump this heavy crude becomes a strong likelihood. Heating emulsified oil is not without technical difficulties. The principal concern is dissociation (separation) of the entrained gas/oil/water mixture.

3) The route as described requires easement corridors through two municipal communities and a military reservation.

4) Construction activities would adversely impact residential and industrial communities during a four- to five-month period.

5) This alternative is without corresponding environmental or economic benefits.

Option B: This option has been considered as a non-urban route having less of an impact upon population and industrial concentrations. In this option, the Gina pipeline route would remain as described in Option A. The Gilda pipeline route, however, would come onshore as in Option A, but would proceed northward along Harbor Boulevard to Gonzales Road. Turning eastward, it would proceed 6.5 miles along Gonzales Road to Rice Avenue, then southward along Rice Avenue for approximately 3.5 miles to Pleasant Valley Road, where the pipeline moves in a southwesterly direction to the

Ormond Beach treatment site. This circuitous route covers approximately 46 miles.

The disadvantages of Option B are similar to those of Option A, except that onshore heating of this heavy crude oil in transporting it the required distance becomes a matter of reality.

5.3.5 Consistency Review of Two Existing Alternatives

Two additional pipeline routings have briefly been reviewed to satisfy consistency criteria of the California Coastal Management Program (CCMP), in consolidating offshore pipelines and onshore processing facilities as it would apply to Union's proposed offshore platforms, Gina and Gilda. The evaluations of these additional pipeline routings have substantially relied upon the conservation of energy (as a diminishing resource) and their unique practicability within engineering design concepts. The two alternatives reviewed are:

Alternative A

A new pipeline system totalizing the production from Union Platforms Gina and Gilda for delivery through an existing Chevron pipeline system via Chevron's marine loading terminal at Carpinteria to Mobil's Rincon processing facility.

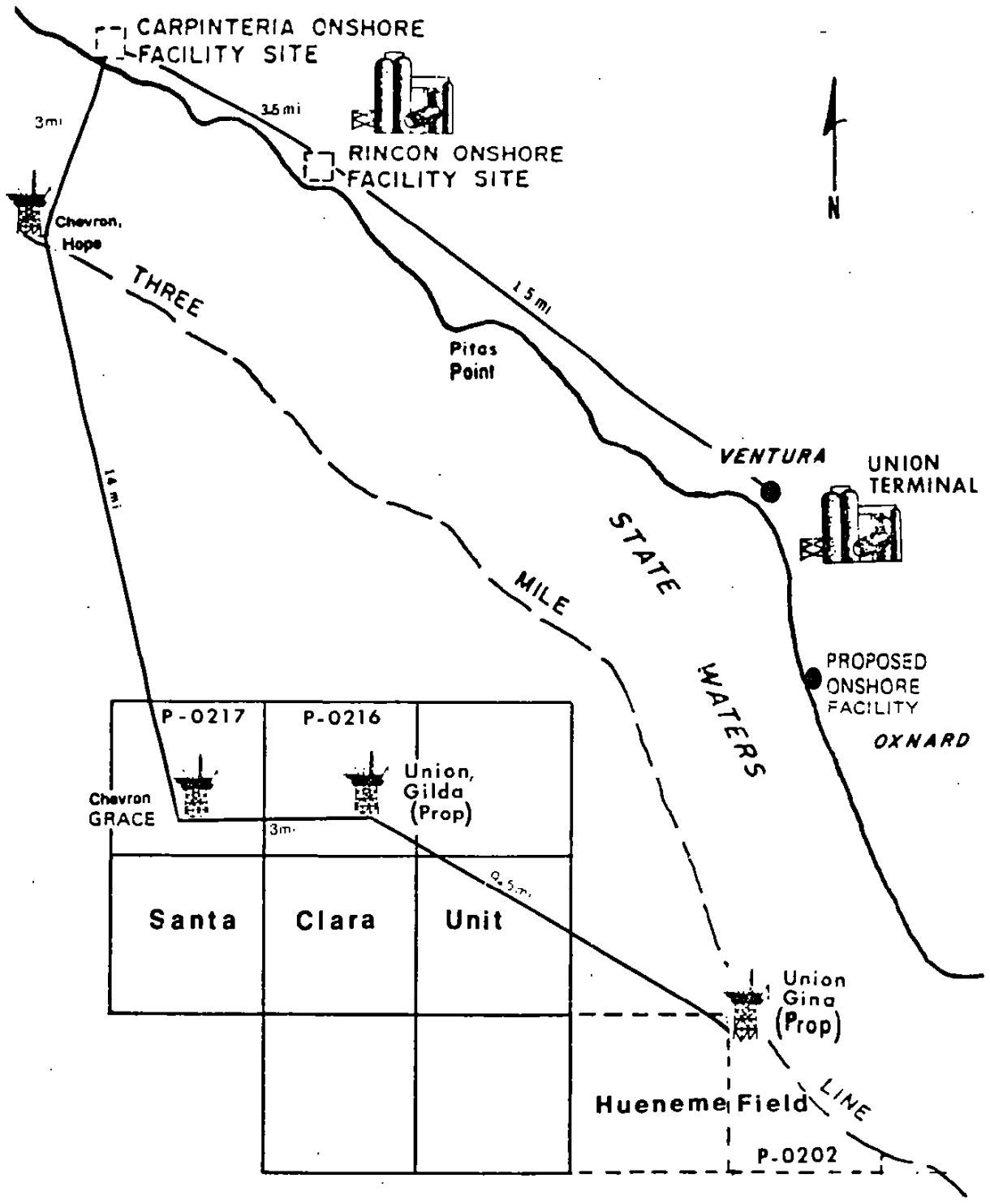
Alternative B

A new pipeline system totalizing the production from Union Platforms Gina and Gilda for delivery directly to Mobil's Rincon processing facility.

Description of the Alternative Routes Considered

Alternative A

Alternative A (Figure 5) is predicated on transporting produced fluids from Union Platforms Gina and Gilda to Chevron Platform Grace on P-0217 of the Santa Clara Unit. At Platform Grace, the combined Union production would be commingled with fluids from Grace for subsea transport to Platform Hope, through an existing pipline system.



CMP CONSISTENCY REVIEW

Figure 5-5

Map not to scale

Source: Dundas Associates

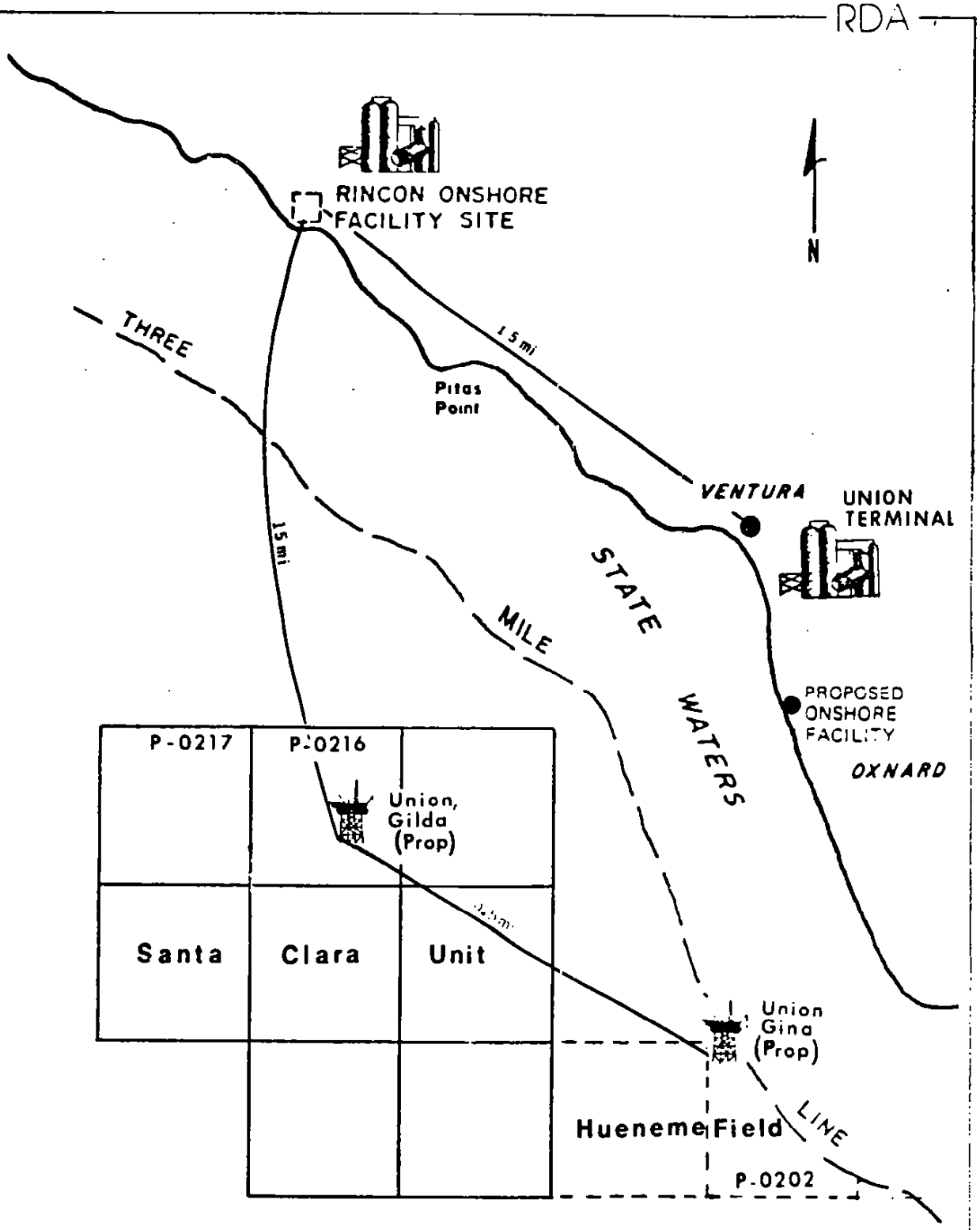
On Platform Hope, the combined fluids from Grace will be further combined with other platform fluids for transport onshore to Chevron's marine terminal at Carointeria. From Chevron's terminal a new onshore pipeline would be required for transporting fluids to Mobil's Rincon processing facility and then on to the Union Ventura Pipeline Terminal. In this alternative the route would involve approximately 48 miles of pipeline.

Alternative B

As shown in Figure 5-6, would provide a new direct subsea pipeline route from Platform Gilda to the existing Mobil Rincon treatment facility. After processing, the crude would be pumped through an existing 22 inch pipeline to Union's pipeline terminal at Ventura. Alternative B, like Alternative A, would require the placement of a subsea pipeline from Gina to Gilda and commingling of Gina's fluids with those of Gilda for transport to the Rincon facility. This route would require approximately 39 miles of pipeline of which only 15 miles presently exist.

Analysis

The oil which would be produced from Platforms Gina and Gilda is typical of the heavy viscous crudes found in California. In transferring fluids from Gina to Gilda (or any location) the pressure maintained on the fluid must be kept at a pressure at least as high as that of the reservoir to prevent dissociation of the natural gas held in solution. Retaining the natural gas in solution will permit the produced fluids to be pumped at a pipeline pressure substantially below that which would be required in its-gas-free state. Conditions on Platform Gilda, however, are more typical of California oil reservoirs where, with time, produced fluid pumping pressure will increase as water within the reservoir displaces the oil recovered. A laboratory analysis of the reservoir fluids has indicated that commingling of the production from these reservoirs will further increase pipeline resistance with a resulting increase in pumping pressure.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PROPOSED ONSHORE FACILITY
OXNARD
P-0217
P-0216
Union, Gilda (Prop)
Santa
Clara
Unit
Union Gina (Prop)
Hueneme Field
LINE
P-0202
CMP CONSISTENCY REVIEW
Figure 5-6
Map not to scale
Source: Dundas Associates

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Because of the differing specific gravities of oil produced on Gina and Gilda, and the vast difference in their reservoir pressures, it would be necessary to treat (at least in part) the fluids from Gina and Gilda for water and gas removal. This would necessitate an offshore treatment facility which would require a substantially larger platform than Gilda to accomodate heater treaters and other processing components. From a practical viewpoint, it would require installation of a third platform as an offshore treatment facility.

In the treatment process, temperature of the treated crude is elevated, thereby facilitating pumping characteristics. However, the advantages of pumping heated oil through 14 to 15 miles of subsea pipeline rapidly diminish from heat dissipated to ocean waters. Losing its heat, the crude becomes very viscous with a corresponding increase in pumping pressure that could exceed the safe operating limits of the pipeline from Grace to Hope. Therefore, it could be necessary to install an intermediate pumping platform to maintain pipeline pressure within the design limitations of the pipeline. The oil would again have to be boosted at Platform Hope and at the Chevron terminal to facilitate further transport. Similar logic would apply in transporting the crude by subsea pipeline from Platform Gilda to the Rincon Facility, although it would be possible to design the pipeline for the more severe pumping pressure required.

The high resistivity to transporting the Gina and Gilda fluids is reflected in a markedly higher energy resource consumption than the proposed pipeline route and onshore facility. A conservative estimate of electrical energy required for Alternative A (a worst case scenario), would be equivalent to the electrical requirements of more than 2,500 homes.

CONCLUSIONS

From the foregoing analysis it is conclusively established that CCMP consistancy utilization of either the existing pipelines or onshore facilities of these alternatives, due to the unique condition of this project, is not within the public interest.

5.4 Deny, Modify or Postpone the Proposal

The Secretary of the Interior will be asked to approve the proposed plan for development and production. Besides approval, four basic responses could be made:

1) Deny the project as submitted.

2) Deny in part and approve in part the project as submitted.

3) Postpone at this time the project as submitted.

4) Approve the project on the condition that it be modified by any of the operational alternatives found preferable.

5.4.1 Deny the Project as Submitted

Denial of the project would be based on technological features and/or its potential impacts on the environment or natural resources. The consequence of a denial would be the preservation, at least temporarily, of the subject natural resources and the existing environment surrounding the project. The denial would correspondingly result in the unavailability of much needed supplies of oil and natural gas for consumer needs. As discussed in the preface, present energy demand exceeds known readily available reserves in the United States. Consequently, this loss of reserve capacity would require increased production from other sources, increased importation of foreign oil, or a reduction in demand for energy.

5.4.2 Deny in Part and Approve in Part the Project as Submitted

The proposal is an integral plan for development/production of the subject lease, with each component depending in part upon the approval and implementation of the other components. However, this does not preclude partial approval of the proposed project. The section on Environmental Impacts addressed the impacts associated with each element of the project as proposed. It should be recognized that the need to replace an unapproved component would result in impacts associated with the revision. To the extent that deficiencies resulting in excessive adverse impacts would be correct, the revision could result in decreased environmental impacts.

5.4.3 Postpone at This Time the Project as Submitted

The proposed project is within presently known technology for the development and production of crude oil and associated natural gas developed on offshore platforms. The decision to postpone approval of the projects at this time would eliminate any site-specific short-term adverse environmental impacts for the duration of the postponement period. Postponement of the project at this time would create a further dependence upon foreign imports of oil. This would not be in the public interests for the following significant reasons:

1) Increased dependency upon foreign importation of petroleum resources, with its unstable escalating price structure.

2) Proposed alternative energy resources - solar, geothermal, fuel synthesis, and wind energy - are not currently either technologically or economically feasible.

3) Coal as an alternative energy resource is undeveloped in the Western United States. (It would take approximately three to four years to develop this resource.)

4) The future of nuclear energy resources, which presently use fissionable materials, is under serious question.

5) The substantially higher costs associated with foreign oil and alternative energy resources would contribute to the present inflationary spiral.

5.4.4 Approve the Project on Condition That it be Modified by Any of the Operational Alternatives

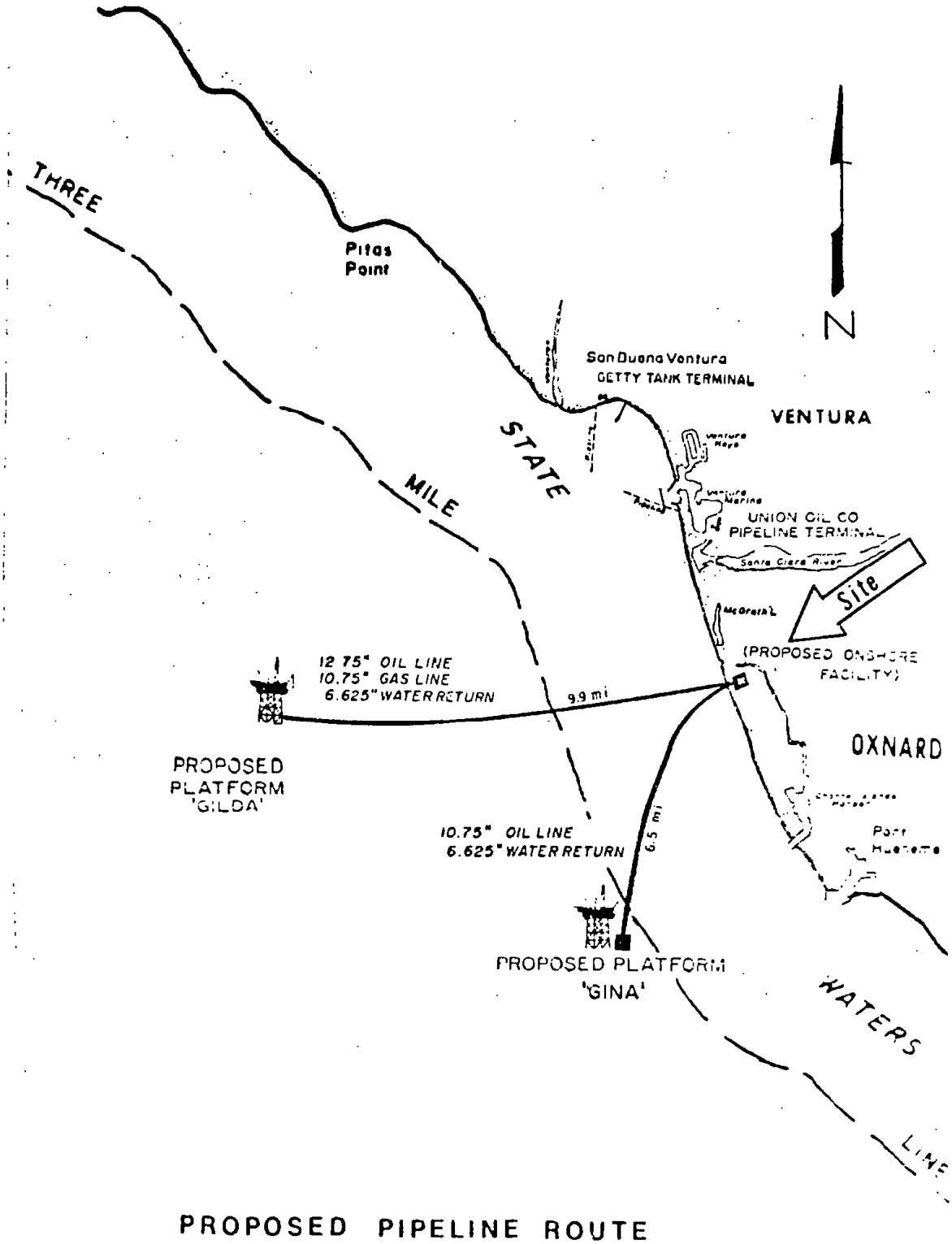
The environmental impacts of each component have been previously described. The cumulative impacts of each component or alternative to that component would be the combination of the individual impacts. However, selection of an alternative which was unacceptable to the unit operator could result in the project not going forward.

5.4.5 Energy Alternatives

In light of the extensive discussion necessary to adequately describe and evaluate energy alternatives, such discussion is beyond the scope of this report. Detailed discussion of this issue is contained in numerous Environmental Assessments of similar or larger projects in the Santa Barbara Channel. Relative evaluations, however, have been made to determine the order of magnitude of energy savings by utilizing the latest technology for heat recovery at the onshore facility, and additional energy requirements for each alternative onshore treatment site in terms of additional energy needed for pumping the produced crude oil.

5.5 No Project

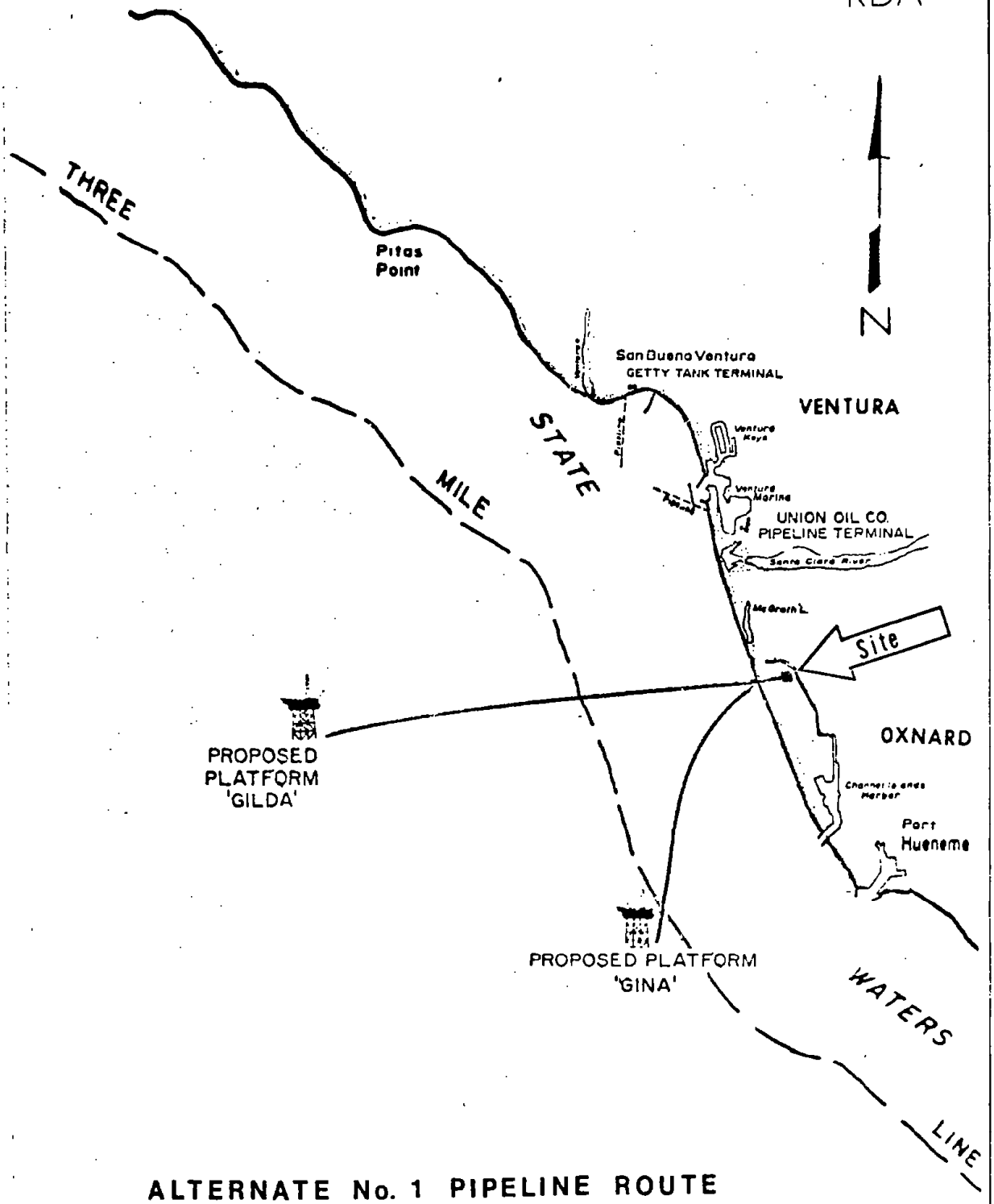
Approval of the project in its entirety could be denied. In view of the current energy shortage, it would seem inconsistent with the national goal of independence from politically sensitive and economically unstable foreign energy resources. Further, as discussed in the other alternatives within this section, the use of alternative resources in meeting national energy commitments, where these resources are not now either technically or economically feasible, could result in adverse socioeconomic and environmental impacts. These impacts would not be in the public interest. Conversely, approval of the project would not result in any significant adverse environmental impacts.



PROPOSED PIPELINE ROUTE

Figure 5-1

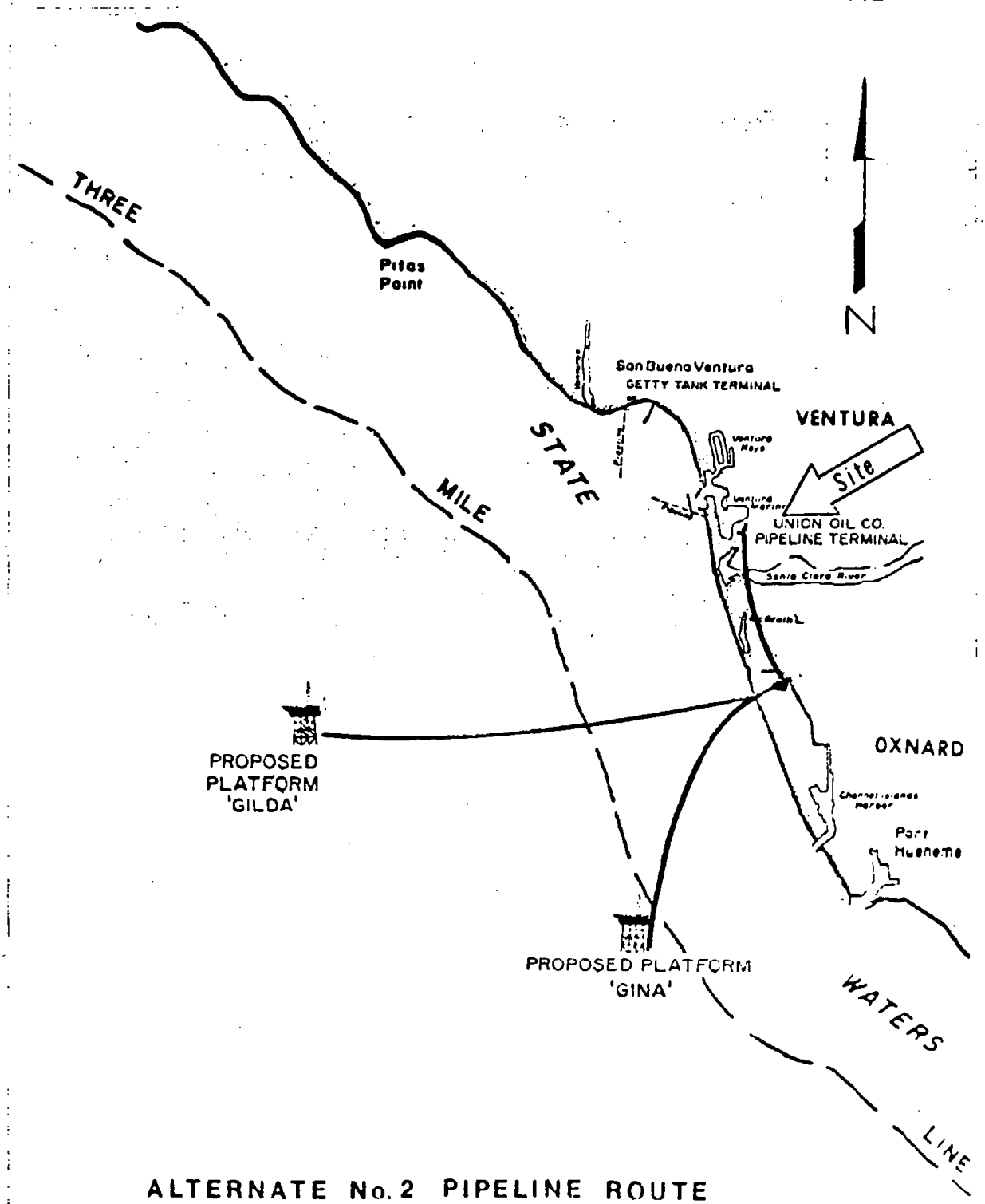
Source: Dundas Associates



ALTERNATE No. 1 PIPELINE ROUTE
EAST MANDALAY BEACH SITE

Source: Dundas Associates

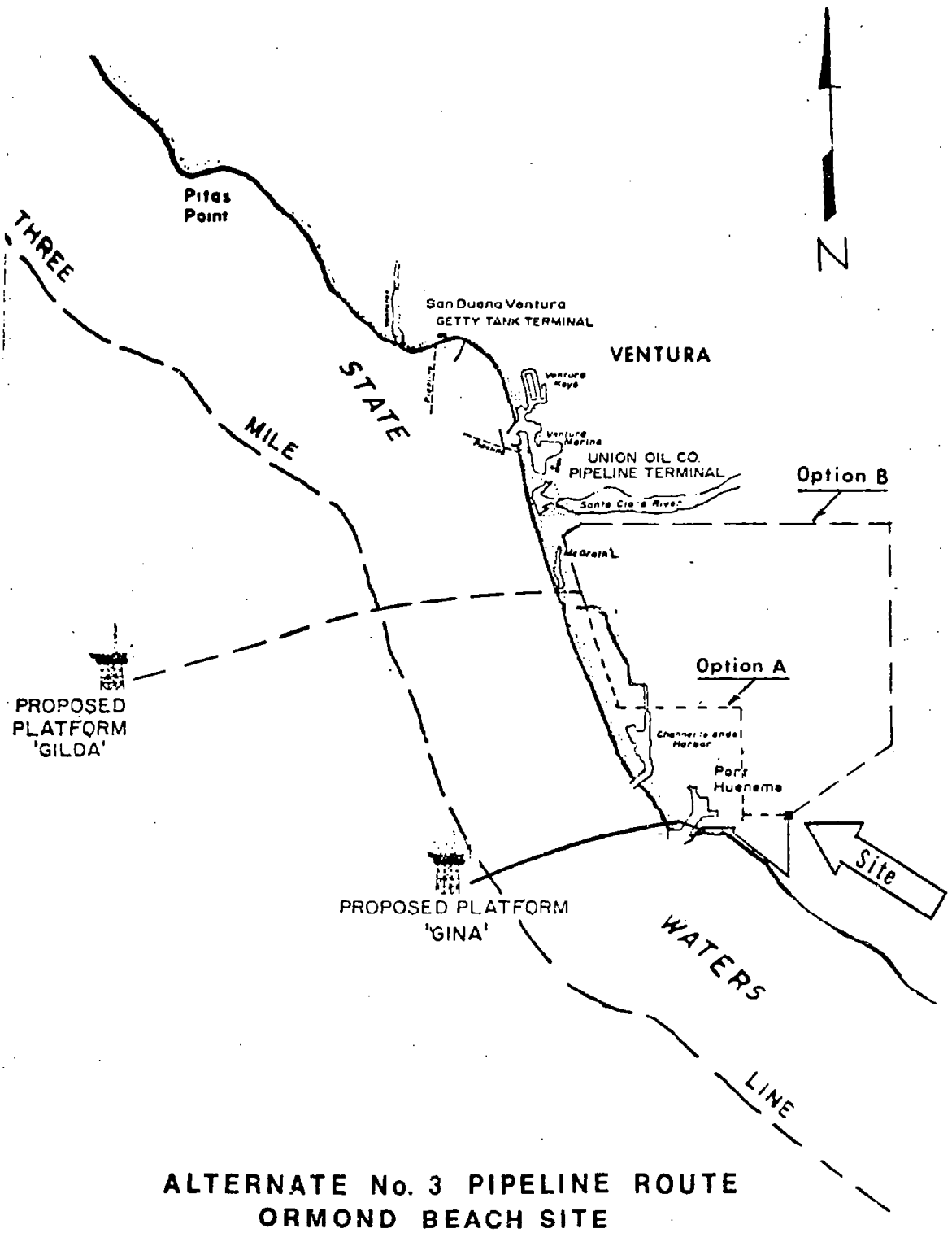
Figure 5-2



ALTERNATE No. 2 PIPELINE ROUTE
UNION TERMINAL

Figure 5-3

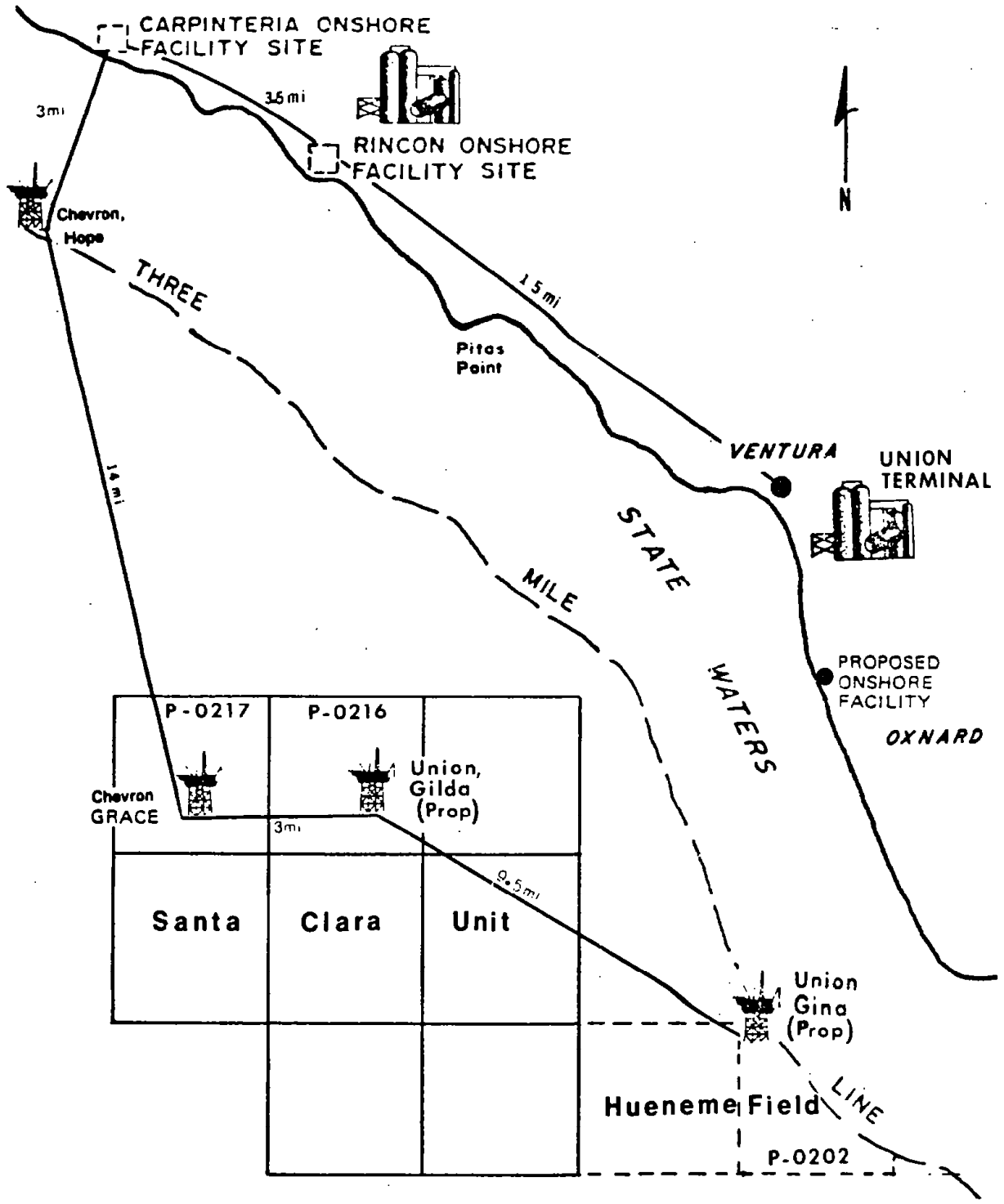
Source: Dundas Associates



ALTERNATE No. 3 PIPELINE ROUTE
ORMOND BEACH SITE

Figure 5-4

Source: Dundas Associates

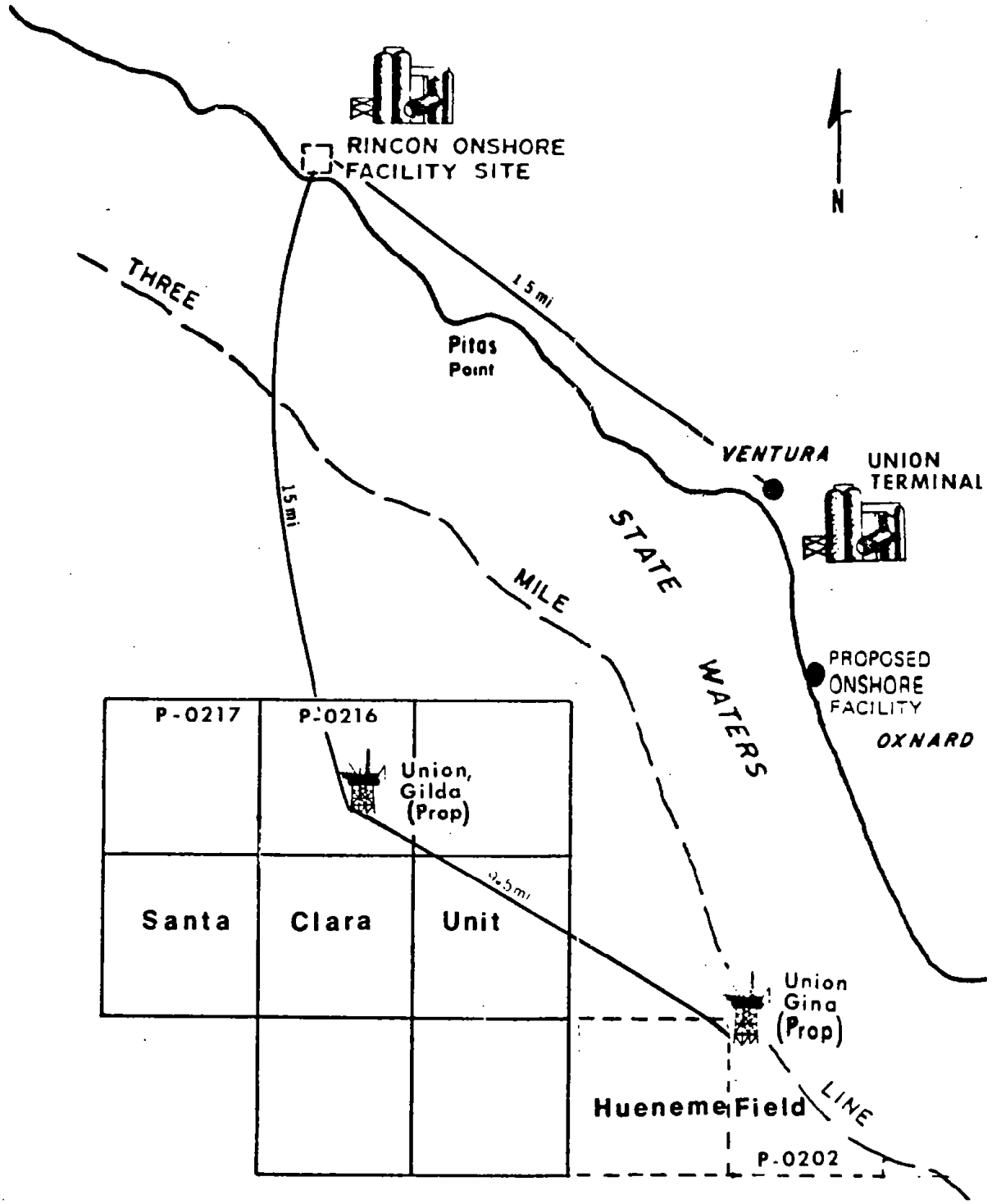


CMP CONSISTENCY REVIEW

Figure 5-5

Map not to scale

Source: Dundas Associates



CMP CONSISTENCY REVIEW

Figure 5-6

Map not to scale

Source: Dundas Associates

SECTION 6

UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

6.1 Geology and Seismology

Erection of the platform, well drilling, and reservoir changes due to the release of hydrocarbons can have an effect upon the specific site geology. This effect may or may not be of significance. Design and construction of the proposed project will be in consideration of potential earthquake activity; consequently, impacts resulting from proposed action would, at most, be minimal.

6.2 Air Quality

Any emissions that would cause non-attainment of NAAQS can be considered adverse. Emissions produced during the construction phase of the project, both offshore and onshore, and during the drilling phase are necessary and unavoidable. The duration of these impacts is relatively short-term; therefore, no significant or irreversible impacts are expected.

During the operational phase, emissions at the platform would be below source emission levels for similar onshore processing facilities. Consequently, the effect upon NAAQS would be minimal.

6.3 Water Quality

Platform and pipeline installations will result in a localized increase in water turbidity. Platform drilling and operations will result in the introduction of relatively small quantities of treated sewage, cleaned drill cuttings, and non-toxic drilling muds. Discharges of these wastes are regulated by OCS orders and are disposed of under NPDES Permit. The effect upon ocean water quality would be unavoidable and localized, but reversible.

6.4 Oceanology

Placement of the platform supports and pipelines would have some effect upon seafloor sediments within very limited areas. The platform supports and pipelines will undoubtedly result in some very localized scouring from bottom currents and near-shore tidal actions. This effect, however, would be short term, since bottom-dwelling organisms attaching themselves to these structures would tend to stabilize these highly localized areas. These actions are unavoidable, but reversible.

Discharged drill cuttings and spent muds will descend to the ocean floor, adding a new sedimentary layer in the vicinity of the platform. These materials will consist primarily of rock chips, sand, and high-density mud, which has been found to substantially increase habitat for a large number and diversity of marine organisms (Simpson, Ref. 25).

6.5 Flora and Fauna

During installation of the platform and placement of the subsea pipeline, some localized adverse effects will have an unavoidable impact on flora and fauna. Bottom-dwelling organisms are particularly susceptible; consequently, some temporary loss of feeding ground for the pelagic species will occur. Benthic organisms, however, are quick to recover following stabilization of the disruptive effects. Therefore, the effects upon local flora and fauna are unavoidable, but reversible.

6.6 Pelagic Environment

The more mobile animal species of the sea will tend to avoid disruptive activities. After a period of time, however, underwater structures are known to become a habitat for a wide diversity of sea life where none had previously existed. Consequently, this becomes an unavoidable but beneficial effect.

6.7 Other Uses of the Area

The presence of a large structure in open ocean waters poses potential for hazards, particularly to craft not assigned to sea lanes. The presence of such a structure may also cause some temporary adverse effects upon sea mammals. These adverse effects are usually short-lived, however, as small-craft operators are known to utilize such structures as navigational aids, and sea mammals also come to know these structures as feeding grounds.

6.8 Socio-Economic Effects

Among the short-term but unavoidable construction-related impacts are some possible disruption of tourism, fishing, and recreation; also, some surface-street traffic congestion, land use, and unpleasing aesthetics of construction could occur. Significantly, some impacts are irreversible, since they commit future generations to land use and diminishing resources.

SECTION 7

REFERENCES

7.1 Bibliography

Ref. No.	Reference Source
1	American Petroleum Institute. structing Fixed Offshore Platforms. API RP-2A.
2	Bybee and Richards. National Marine Fisheries Service, Potential for Commercial Industry Expa bara and Ventura County Harbors, 1979.
3	Bureau of Land Management. Final Environmental Statement, OCS Sale No. 48. Volumes 1-5, 1979.
4	California Office of Planning and Research. Offshore Oil and Gas Development: Southern California. Volumes 1 & 2, 1977.
5	California Energy Resources Conservation and Development Commission. Staff Report and Appendix A, 1978.
6	California Division of Oil and Gas. 63rd Annual Report of the State Oil and Gas Supervisor, 1977.
7	California Coastal Commission. Coastal Management Program and Final Environmental Impact Statement, 1977
8	California Division of Oil and Gas. Laws for Conservation of Petroleum and Gas. Publication No. PRC 01.
9	California State Lands Commission. Resumption of Drilling Operations in the South Elwood Offshore Oil Field from Platform Holly. Final EIR, Volumes 1-3, 1974. (Dames & Moore)
10	California Air Resources Board. New Source Review Rules, 1978.

11 Chevron Research Company. Environmental Impacts of Offshore Disposal of Drilling Fluids and Cuttings. By Palmer and McAuliffe.

12 Dundas Associates. E/R Pitas Point Platform and Subsea Pipeline. Prepared for Texaco Inc., 1979.

13 Dundas Associates. Hueneme Offshore Platform and Onshore Facility. Prepared for the Union Oil Company, 1978.

14 Environmental Protection Agency. Air Pollution Emission Factors AP-42. Third Edition, 1977.

15 Kol · cal and Oceanographic Survey of the Santa Ba 1971.

16 Dames & Moore. Coastal Water Research Project, 1976. American Petroleum Institute.

17 Santa Barbara County. Air Quality Attainment Plan, 1978.

18 U.S. Geological Survey. Federal Oil and Gas Leases in the Outer Continental Shelf. Final ES, Volumes 1-3 (FES-76-13), 1976.

19 U.S. Geological Survey. Oil a·)evelopment in the Santa Barbara Channel Outer Continental Shelf. Final ES, Volumes 1-3, (FES-76-13), 1976.

20 U.S. Geological Survey. Pro velopment, Santa Ynez Unit, Santa Barbara Cha Volumes 1-3, (FES-74-20).

21 Ventura County. Air Quality Management Plan, 1978.

22 Ventura County. Potential Capacity Available in the Ventura County Crude Oil Transportation and Distribution System for OCS Production, 1978.

23 Western Oil and Gas Association. Statement by Teknekron, Inc. Before the Department of the Interior, June, 1978.

24 Woodward-Clyde Consultants. Chevron USA Proposed Pipeline Installation in the Santa Barbara Channel. (Draft EIR)

25 Simpson, Robin A. The Biology of Two Offshore Platforms. Institute of Marine Sciences, University of California, March, 1977.

26 Jones, G. F. Surface Circulation in the Southern California Bight, 1971. (SCCWRP Study)

27 Reid, J. L., Jr. Physical Oceanography of Southern California, 1965.

28 National Oceanic and Atmospheric Administration. National Ocean Survey, 1974.

29 Dundas Associates. Supplement to: Hueneme Offshore Platform E/R, Union Oil Company, 1979.

30 Intersea Research Corporation. Design of Seasonal Waves, Currents and Weather Conditions for OCS P-0216, Santa Barbara Channel, California, June, 1979.

7.2 Sources of Personal Contact

Personal Contact: U.S. Coast Guard Department of Transportation, Santa Barbara, California: Department of Harbors, June 1979.

Personal Contact: Port of Hueneme/Oxnard Assistant Manager, June, 1979.

Personal Contact: Oxnard Marina, General Manager.

Personal Contact: Ventura County Park Development District, Austin Klien.

Personal Contact: Station KFYT Program Director, Hal O'Donnel.

Personal Contact: California State Department of Fish and Game, Earl Lauppe and Richard Nitsos.

Personal Contact: James R. Bybee, National Marine Fisheries Service, Fisheries Development Division, Terminal Island, California.

Personal Contact: John B. Richards, University of California Marine Advisory Program, Santa Barbara, California.

25 Simpson, Robin A. The Biology of Two Offshore Platforms. Institute of Marine Sciences, University of California, March, 1977.

26 Jones, G. F. Surface Circulation in the Southern California Bight, 1971. (SCCWRP Study)

27 Reid, J. L., Jr. Physical Oceanography of Southern California, 1965.

28 National Oceanic and Atmospheric Administration. National Ocean Survey, 1974.

29 Dundas Associates. Supplement to: Hueneme Offshore Platform E/R, Union Oil Company, 1979.

30 Intersea Research Corporation. Design of Seasonal Waves, Currents and Weather Conditions for OCS P-0216, Santa Barbara [illegible], California, June, 1979.

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Personal Contact: U.S. Coast Guard Department of Transportation, Santa Barbara, California: Department of Harbors, June 1979.

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Personal Contact: John B. Richards, University of California Marine Advisory Program, Santa Barbara, California.

Personal Contact: Richard Nitsch, California State Department of Fish and Game, Los Angeles, California

Personal Contact: Park Rangers John Kolb and Mike Slatder, State of California Resources Agency, Department of Parks and Recreation, Ventura Regional Office.

Personal Contact: Ronald Dow, Marine Biologist at Point Mugu Naval Base.

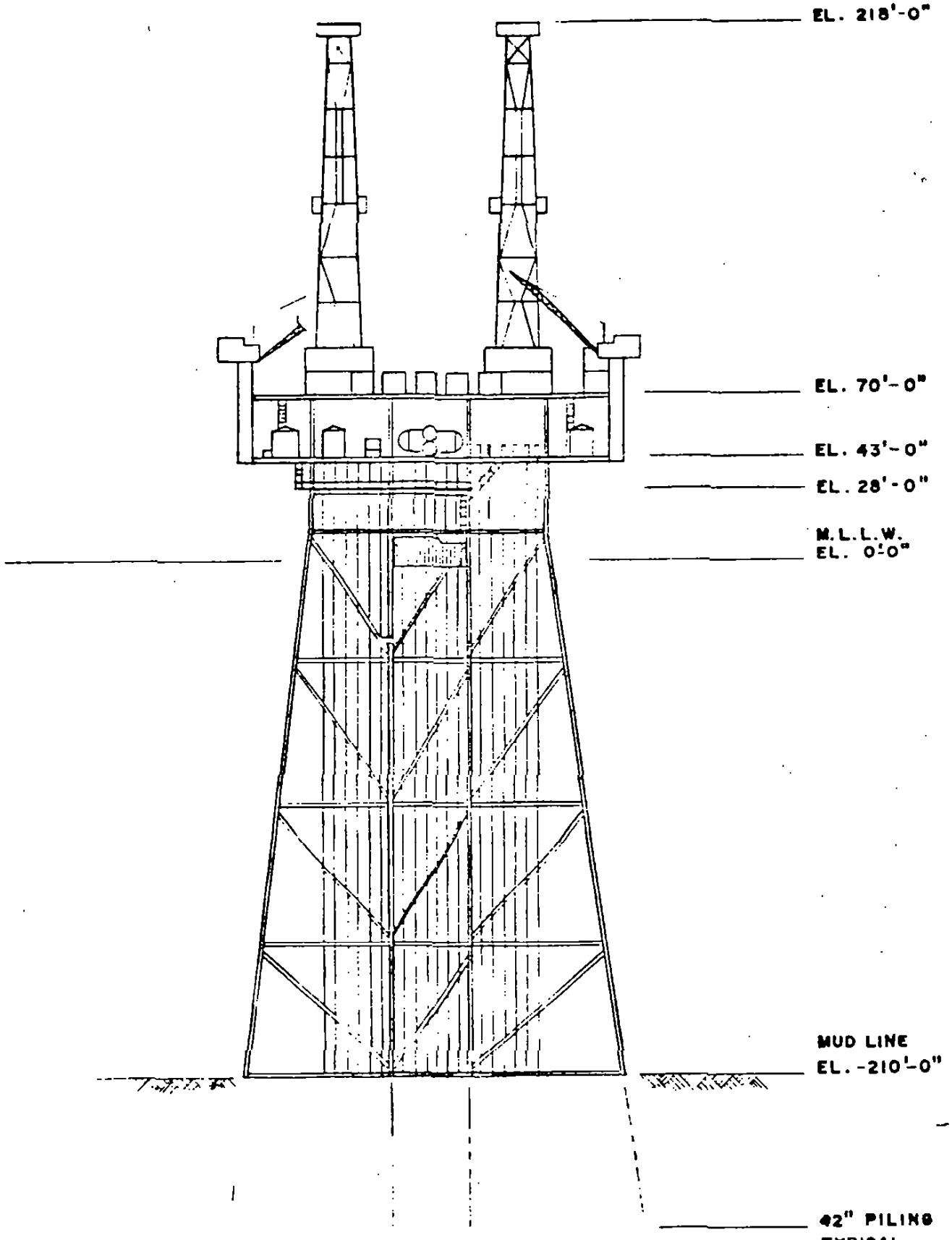
Perso DVM, Environmentalist.

Personal Contact: U.S. Naval Weather Station, Point Mugu.

SECTION 8

EXHIBITS

EXHIBIT A



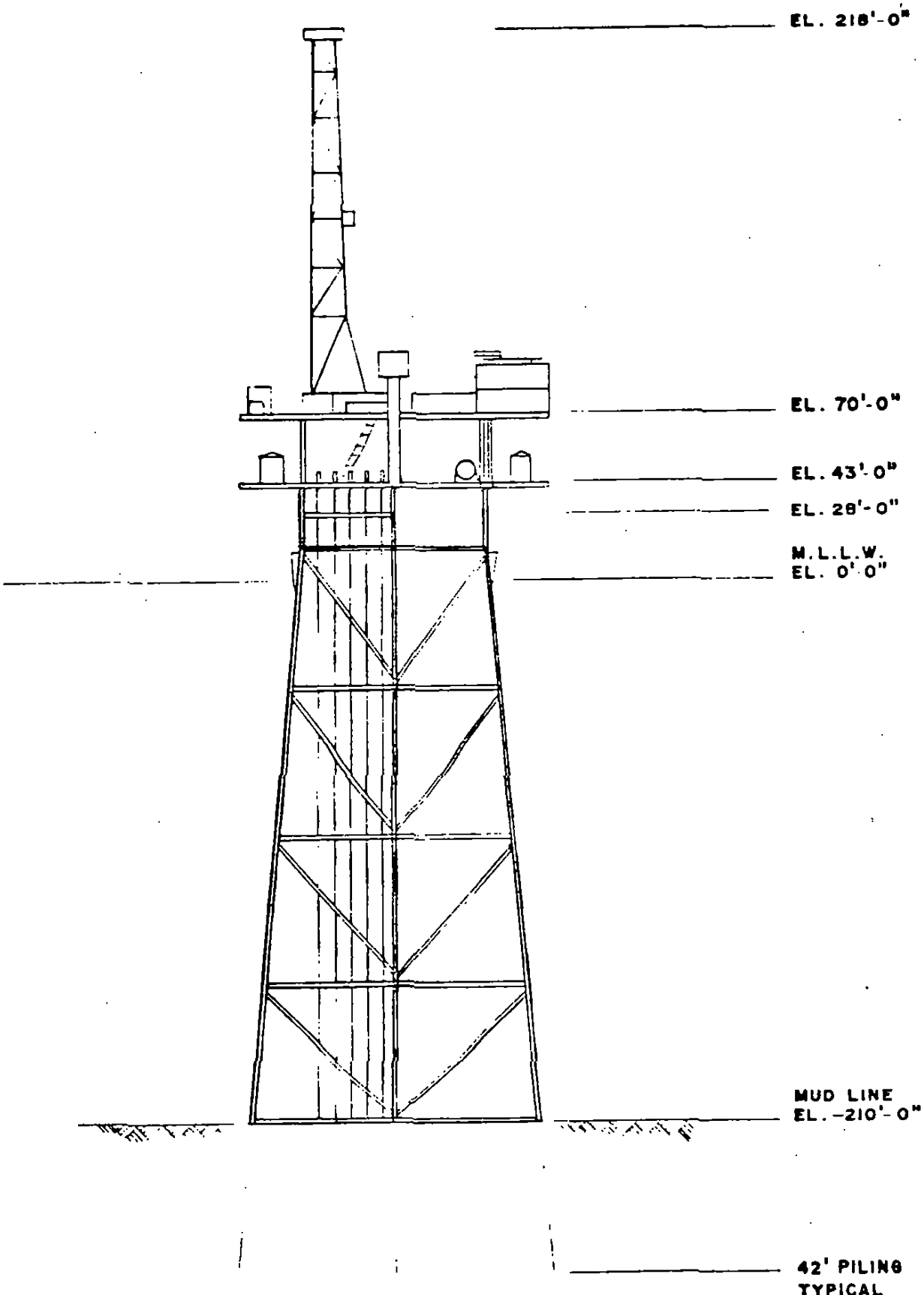
WEST ELEVATION

LOOKING EAST

MEMBER SIZES & EXACT CONFIGURATIONS ARE NOT SHOWN

UNTIL FINAL DESIGN ENGINEERING & STABILITY CHECKS ARE COMPLETE

EXHIBIT B



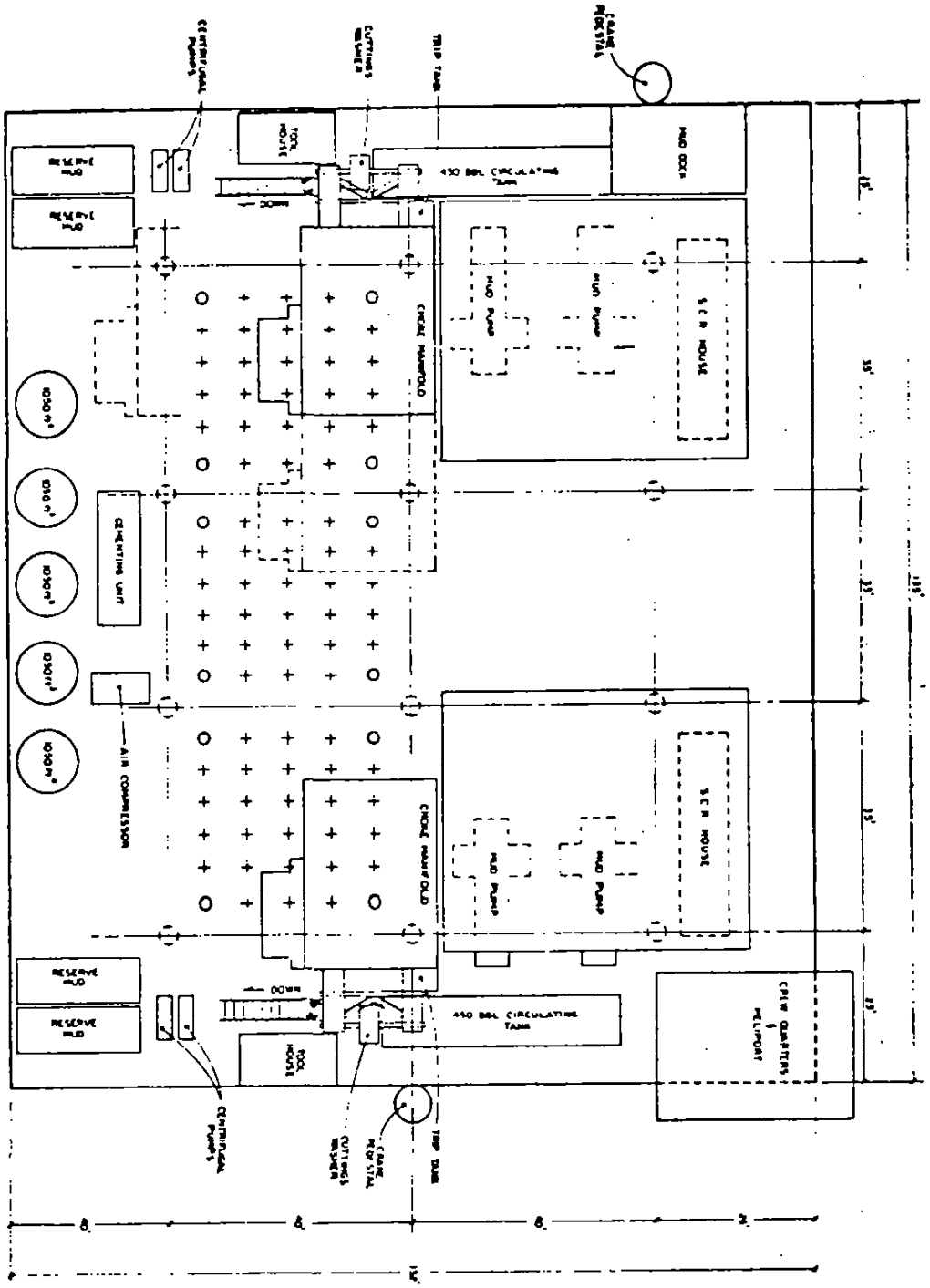
SOUTH ELEVATION

LOOKING NORTH

MEMBER SIZES & EXACT CONFIGURATIONS ARE NOT SHOWN

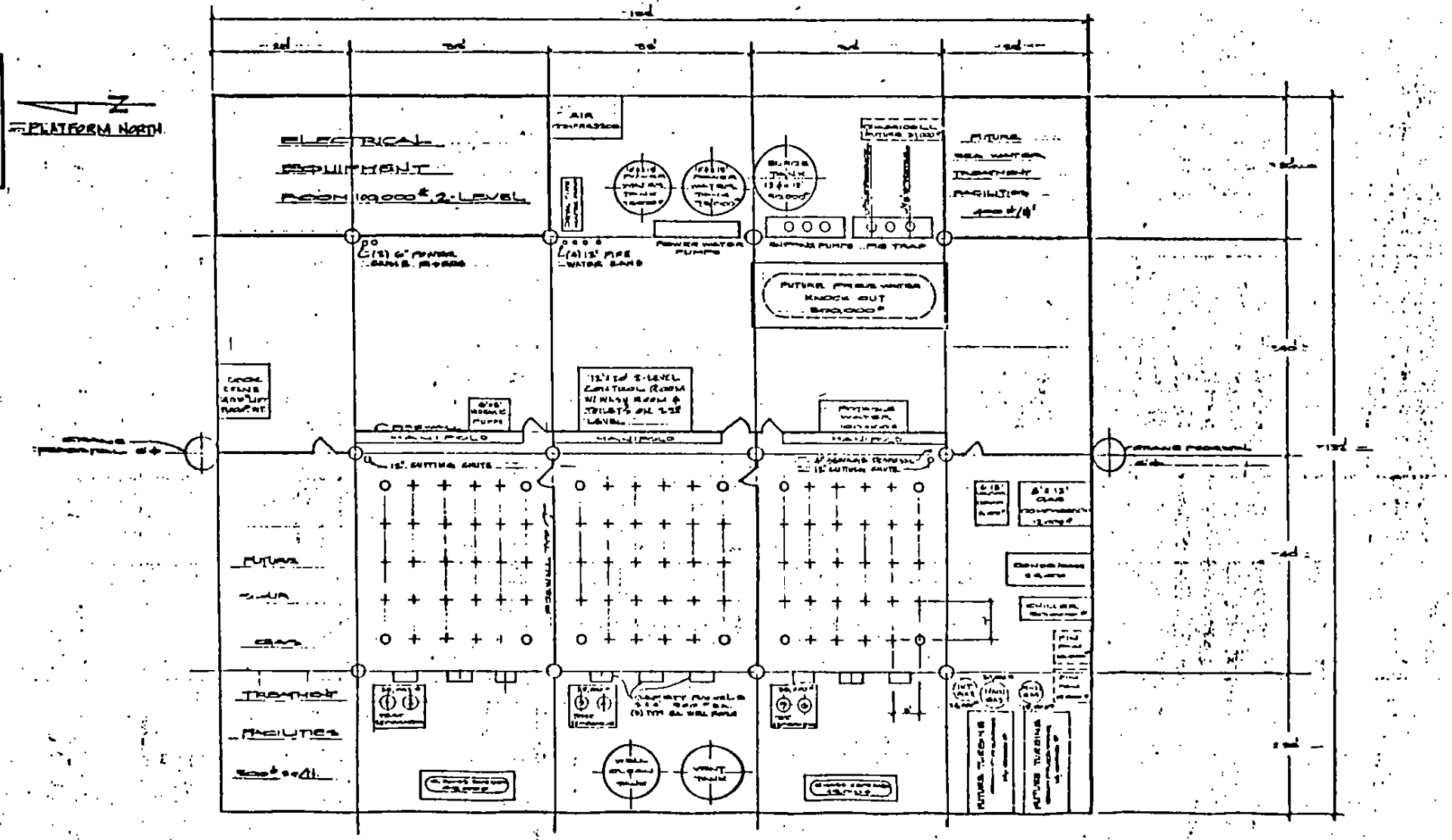
UNTIL FINAL DESIGN ENGINEERING & STABILITY CHECKS ARE COMPLETE

EXHIBIT C



P-101	972-173	PROPOSED PLATFORM DECK LAYOUT DRILLING	
		UNION OIL CO	VENTURA, CALIF

EXHIBIT D



PROPOSED PLATFORM DECK LAYOUT

8-5

PRODUCTION

UNION OIL CO

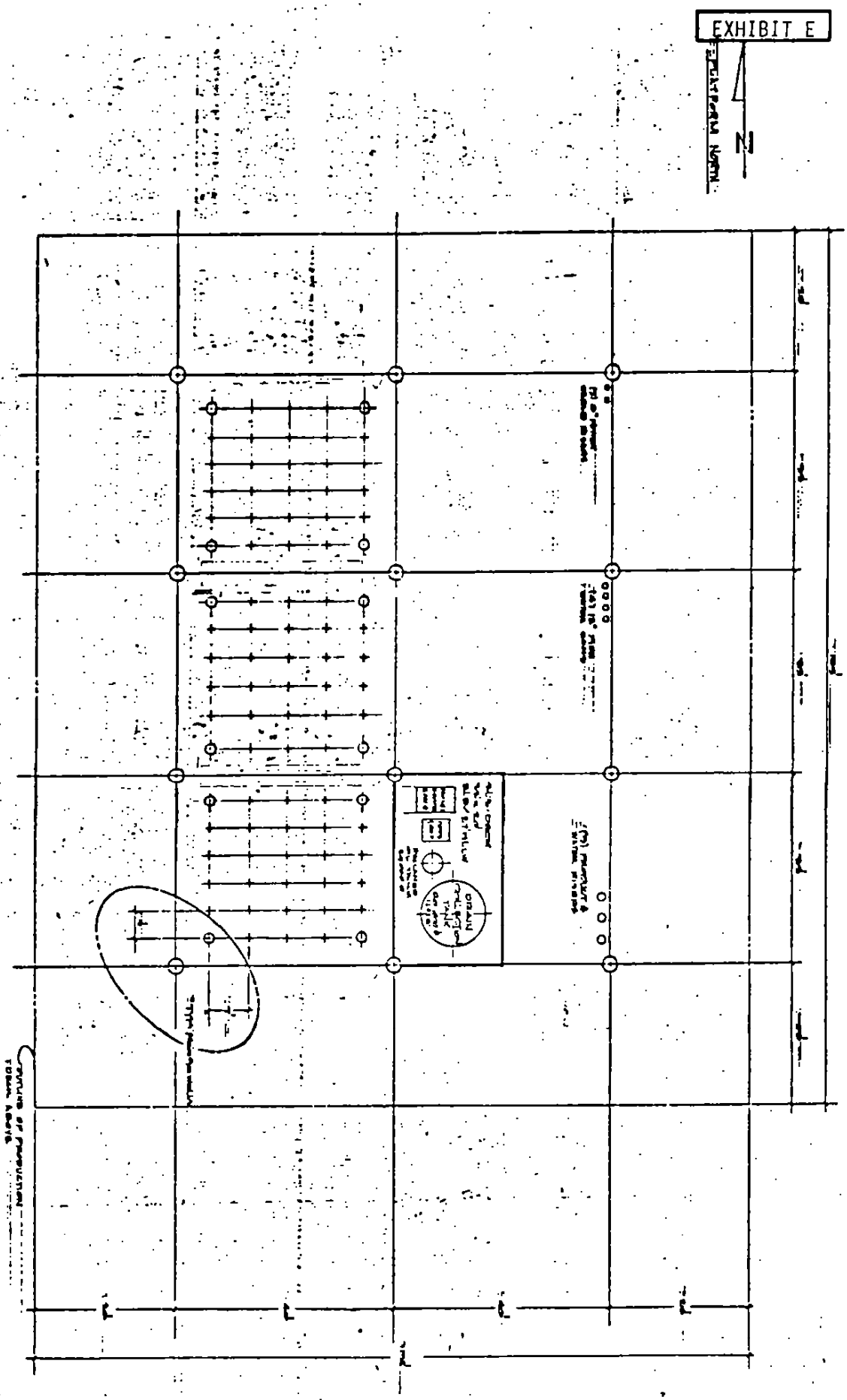
VENTURA, CA

972-193

ASSOCIATED DESIGN

P-100

EXHIBIT E



P-102

972-193

PROPOSED PLATFORM DECK LAYOUT

8-6 SUB-DECK

UNION OIL CO. VENTURA, CALIF.

Source: Clean Seas, Inc.

VAN # 1 - GREEN

CARPINTERIA YARD

800' 16" Kepner boom
600' 8" Kepner boom

SORBENTS:

.. Conwed
- Booms - 5bales/24' per
- Sweeps - 5bxs/100' per
- Rugs - 2rolls/300' per

.. 3M Company
- Booms - 15bales/40' per
- Sheets - 10bales/100 per
- Sweeps - 2bales/100' per

.. Dow Imbibers
- Bags - 1 bx/100 per
- Blankets - 20bxs/1 per

.. Oil Snare - 1bx/30 per

51T Acme Skimmer w/1200 gal.bag
25':3" hose w/2"-3" valves
25':3" skimmer discharge hose
1/30' bouy line w/bouy
½" nylon, 3/4" nylon, ¼" manila

Floats/Skimmer	- 5
Rakes	- 1
Pitchforks	- 2
Tools	- Misc.
55 Gallon Drum	- 2
Anchors 3/40#, 1/22#	- 4
Anchor Line 200':½" nylon	- 4
Crown Line w/bouy 200'	- 4
Towing Bridle - 5/8" wire	- 1
Chemical Lights	- 15
Life Preservers	- 4
Mops	- 5

VAN # 2 BLUE

GETTY OIL TERMINAL - GAVIOTA

800' 16" Kepner boom

SORBENTS:

.. Conwed
- Booms - 10bales/24' per
- Sweeps - 5bxs/100' per

.. 3M Company
- Sheets - 10bales/100 per
- Sweeps - 2bales/100' per

.. Dow Imbiber
- Bags - 1bx/100 per
- Blankets - 20bxs/1 per

.. Oil Snare - 1bx/30 per

51T Acme Skimmer w/5000 gal.bag
25':3" hose w/30' : ½" bouy line and w/bouy - 1

Skimmer hose 75':3" blue (51T)	- 2
100':½" nylon, 100':3/4"tow line	- 1ea.
1000':¼" manila line	- 1 bx
Hose floats	- 5
Life Preservers	- 4
Pitchforks	- 2
Rakes	- 1
Tools	- Misc
55 Gallon Drums	- 2
Anchors, 3/40#, 1/22#	- 4
Anchor Line 200':½" nylon	- 4
Crown Line 200':½" poly w/bouy	- 4
3" Valve	- 2
Chemical Lights	- 5

EXHIBIT F

RDA

562-79

8-8

VAN # 3 — RED

AVILA

1360':43" Expandi boom
990':30" Expandi boom (12 sections)

SORBENTS

.. Conwed
- Boom - 5bales/24' per
- Sweeps - 3boxes/100' per

.. 3M Company
- Boom - 5bale/40' per
- Sheets - 5bales/100 per
- Sweeps - 2bales/100' per

.. Dow Imbibers
- Bags - 1bx/100 per
- Blankets - 20bxs/1 per

.. Oil Snare - 1bx/100 per

51T Acme Skimmer w/1200 gal.bag

Skimmer hose	- 2
[illegible]':3" Discharge hose	- 1
[illegible] Valve	- 2
[illegible]':½" poly bouy line w/bouy	- 1
[illegible]':½" nylon,100':3/4"tow line	- 1ea.
[illegible]':¼" manila line	- 1
[illegible] Floats	- 5
[illegible]e Preservers	- 5
[illegible]chforks	- 2
[illegible]kes	- 1
[illegible]ols	- Misc.
[illegible] Gallon Drums	- 2
[illegible]chor - 22#	- 4
[illegible]chor Line 200':½" nylon	- 4
[illegible] Line 200':½"poly w/bouy	- 4
[illegible] Lights	- 5
[illegible] Skiff w/OB	- 1

VAN # 4 — YELLOW

PT.HUENEME (1200') VENTURA (1500') CHANNEL ISLANDS (1500')

4200':43" Expandi boom
743':30" Expandi boom (9 sections)

SORBENTS

.. 3M Company
- Booms - 20bales/40' per
- Sheets - 12bales/100 per
- Sweeps - 5bales/100' per
- Type 100Roll - 1roll/150'per

.. Dow Imbibers
- Blankets - 20bxs/1 per
- Bags - 1bx/100 per

.. Oil Snare - 1bx/30 per

51T Acme Skimmer w/1200 gal.bag:

Skimmer hose	- 2
25':3" hose	- 1
3" Valve	- 2
30':½" poly line w/bouy	- 1
100':½" nylon,100':3/4" tow line	- 1ea
1000':¼" manila line	- 1
Hose Floats	- 5
Life Preservers	- 4
Pitchforks	- 2
Rakes	- 1
Tools	- Misc
55 Gallon Drums	- 2
Anchors 22#	- 3
Anchor Line 200':½" nylon	- 4
Crown Line 200':½"poly w/bouy	- 4
Chemical Lights	- 10
14' Skiff w/OB	- 1

RDA

EXHIBIT F

562-79

8-9

VAN # 5 — BLACK

SANTA BARBARA

1500':43" Expandi boom
1400': 8" Kepner boom

SORBENTS

.. Conwed
- Sweeps - 1box/100' per
- Blankets - 1roll/200' per

.. 3M Company
- Booms - 10 bale/40' per
- Sheets - 5 bale/100 per
- Sweeps - 4 bale/100' per

. Dow Imbibers
- Bags - 1bx/100 per
- Blankets - 20bxs/1 per

.. Oil Snare - 1bx/30 per

79T Acme Skimmer w/1200 gal.bag - 2
Skimmer hose - 2
25':3" Discharge hose - 1
3" Valves - 2
30':½" poly line - 1
100':½" nylon,100':3/4"tow line - 1 ea.
1000':¼" manilla line - 1
Hose floats - 5
Life preservers - 4
Pitchforks - 2
Rakes - 1
Tools - Misc.
55 Gallon Drums - 2
Anchors 22# - 4
Anchor Line 200':½" nylon - 4
Crown Line 200':½"poly w/bouy - 4
[illegible] - 5
Chemical Lights - 10

VAN # 6 — WHITE

POINT DUME

2475':30" Expandi boom (30 sections)

SORBENTS

.. Conwed
- Sweeps - 6box /100' per

.. 3M Company
- Booms - 11bale/40' per
- Sheets - 10bale/100 per
- Sweeps - 2bale/100'per

.. Dow Imbibers
- Bags - 1bx/100 per
- Blankets - 20bxs/1 per

.. Oil Snare - 1bx/30 per

51T Acme Skimmer w/1200 gal.bag
Skimmer hoses - 2
25':3" Discharge hose - 1
3" Valves - 2
30':½" poly line w/bouy - 1
100':½", 100':3/4" tow line - 1 ea
1000':¼" manila line - 1
Hose floats - 5
Life preservers - 4
Pitchforks - 2
Rakes - 1
Tools - Misc
55 Gallon Drums - 2
Anchors 22# - 4
Anchor Lines 200':½"poly w/bouy - 4
Crown Lines 200':½"poly w/bouy - 1
Chemical Lights - 5

EXHIBIT F
RDA

562-79

8-10

BROWN

VAN # 7 — MORRO BAY

825': 30" Expandi Boom - 6 Sections
1050':43" Expandi Boom - 21 Sections

EQUIPMENTS

3M Company

Booms	- 5 bales/40' per
Sheets	- 15bales/100 per
Sweeps	- 5 bales/100' per

Dow Imbibers

Bags	- 1 box/100 per
Blankets	- 20bxs/1 per
Oil Snare	- 1 box/30 per

Life Preservers	- 4
Tools	- Misc.
Pitchforks	- 2
Rakes	- 2
55 Gallon Drums	- 2
Anchors 22#	- 4
Anchor Line 300' : ½" nylon	- 4
Crown Lines 200':½" poly w/bouy	- 4
Tow Line 100' : 3/4"	- 1
Main Line 1000': ¾"	- 1

ORANGE

VAN # 6 — PORT HUEN

825': 30" Expandi Boom - 10 Sections
1050' 43" Expandi Boom - 21 Sections

SORBENTS

3M Company

Booms	- 5 bales/40' per
Sheets	- 15bales/100 per
Sweeps	- 5 bales/100' per

Dow Imbibers

Bags	- 1 box/100 per
Blankets	- 20bxs/1 per
Oil Snare	- 1 box/30 per

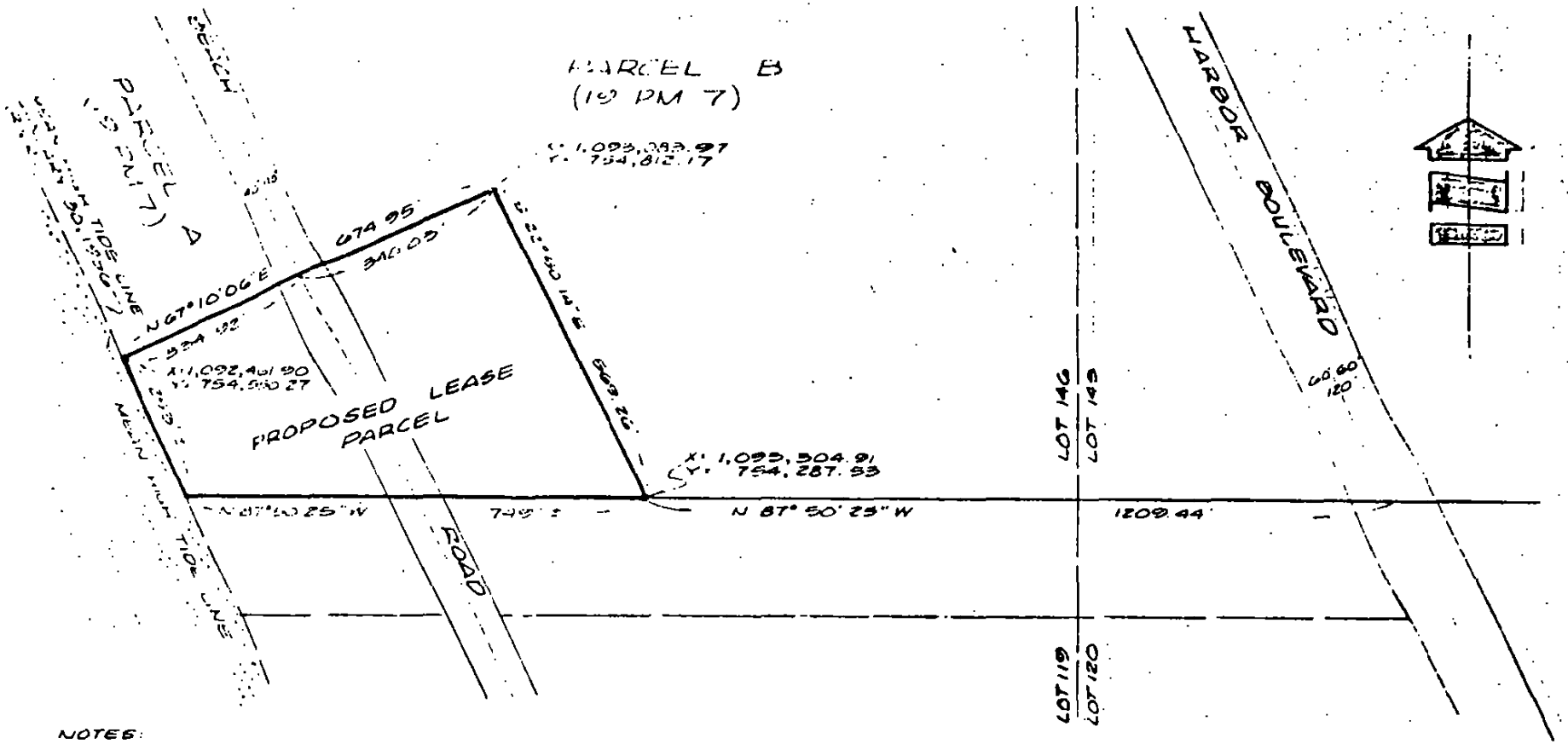
Life Preservers	- 4
Tools	- Misc.
Pitchforks	- 2
Rakes	- 2
55 Gallon Drums	- 2
Anchors 22#	- 4
Anchor Line 300' : ½" nylon	- 4
Crown Lines 200':½" poly w/bouy	- 4
Tow Line 100' : 3/4"	- 1
Main Line 1000': ¾"	- 1

EXHIBIT F

RDA

562-79

8-11



NOTES:
R = 20 RS 32
R' = 19 PM 7

BEARINGS, DISTANCES AND COORDINATES SHOWN ON THIS SKETCH CONFORM WITH THE CALIFORNIA COORDINATE SYSTEM (LAMBERT PROJECTION) ZONE VI. ZONE VI COORDINATES WERE CALCULATED FROM DATA SHOWN ON (R) RS 32 & (R') PM 7.

LEWIS & LEWIS INC

UNION OIL COMPANY OF CALIFORNIA

SKETCH SHOWING

PROPOSED LEASE PARCEL

PORTION OF LOT 146
PATTERSON RANCH SUBDIVISION
(8 MR 1)

EXHIBIT G