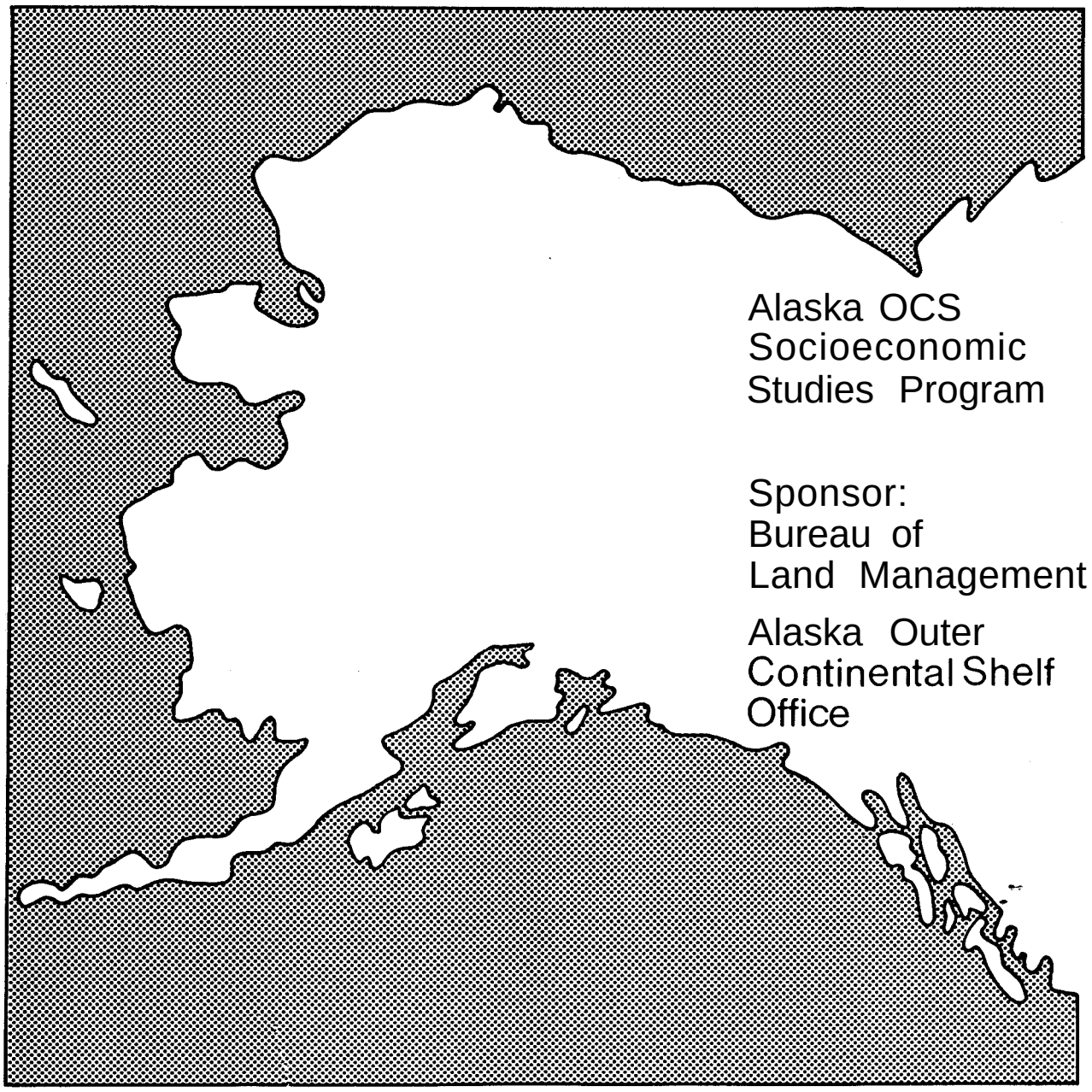
Technical Report Number 17



Alaska OCS Socioeconomic Studies Program

Sponsor:
Bureau of Land Management

Alaska Outer Continental Shelf Office

Monitoring Petroleum Activities In The Gulf of Alaska

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of off-shore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA) as well as other legislation and regulations dealing with the effects of off-shore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program.

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical , social, and economic environments within the state. The analysis addresses the differing effects among various geographic units: the State of Alaska as a whole, the several regions within which oil and gas development is likely to take place, and within these regions, the local communities.

The overall research method is multidisciplinary in nature and is based on the preparation of three research components. In the first research component, the internal nature, structure, and essential processes of these various geographic units and interactions among them are documented. In the second research component, alternative sets of assumptions regarding the location , nature, and timing of future OCS petroleum development events and related activities are prepared. In the third research component, future oil and gas development events are translated into quantities and forces acting on the various geographic units. The predicted consequences of these events are evaluated in relation to present goals, values, and expectations.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decision making. In addition to making reports available through the National Technical Information Service, the BLM is providing an information service through the Alaska OCS Office. Inquiries for information should be directed to: Program Director, Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

Technical Report #17 Contract No. AA550-CT6-61

Alaska OCS Socioeconomic Studies Program

Monitoring Petroleum Activities in the Gulf of Alaska and Lower Cook Inlet Between April 1975 and June 1978

FINAL REPORT

Prepared for

Bureau of Land Management

Prepared by

Dames & Moore

August 1978

Job No. 8699-010-20

NOTICES

1. This document is disseminated under the sponsorship of the U.S. Department of the Interior, Bureau of Land Management, in the interest of information exchange. The U.S. Government assumes no liability for its content or use thereof.

2. This draft report is designed to provide preliminary petroleum development data to the groups working on the Alaska OCS Socio-economic Studies Program. The assumptions used to generate off-shore petroleum development scenarios may be subject to revision.

3. The units presented in this report are metric with American equivalents except for units used in standard petroleum practice. These are barrels (42 gallons, oil), cubic feet (gas), pipeline diameters (inches) , well casing diameters (inches), and well spacing (acres).

ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM
Monitoring Petroleum Activities
in the Gulf of Alaska and Lower Cook Inlet
Between April 1975 and March 1978
Final Report

Prepared by

DAMES & MOORE

August 1978

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INTRODUCTION

The main objective of this study is to present a detailed historical account of drilling activity on the Outer Continental Shelf (OCS) in the Northeast Gulf of Alaska (NEGOA) and Lower Cook Inlet (LCI), that occurred between April 1975 and June 1978. The account includes information about the number, timing, location, depth, and results of wells drilled; equipment used; employment created; wages paid; transportation routes used; and communities impacted. The information developed from this survey is designed to serve immediate planning and decision making objectives of the Bureau of Land Management as well as longer-term research objectives of the Socioeconomic Studies Program. For example, the information is intended to facilitate the preparation of several NEPA requirements in the EIS process (e.g. a description of the existing environment, impact assessment, and identification of mitigating measures). It is also intended to be utilized in the preparation of petroleum development scenarios for subsequent lease sale areas in the Northern and Western Gulf of Alaska.

This research effort was initially designed to rely primarily on information available in secondary sources, such as trade journals and published reports by government and industry. As work progressed, however, it was discovered that the range and detail of data required by the original Scope of Work was not available from secondary sources. In view of the problem of lack of information from secondary sources, an effort was made to obtain information from individuals with firsthand knowledge of various aspects of operations in NEGOA and LCI. Unfortunately, however, much of the data requested by the Scope of Work was not available from either primary or secondary sources within the budgetary constraints of the project.

I. WELLS DRILLED

Introduction

Table 1 summarizes available information concerning the wells drilled in the Northeast Gulf of Alaska and Lower Cook Inlet. Information listed in Table 1 includes the vessel that drilled the well and owner company of well. In addition location, water depth, total well depth, well spud and completion dates, results and approximate cost are provided. To date eleven exploratory wells have been drilled on the OCS in the Northeast Gulf of Alaska lease sale areas. Also, Continental Offshore Stratigraphic Test Wells (C.O.S.T.) were drilled in Lower Cook Inlet, Northeast Gulf of Alaska and the proposed Kodiak (Western Gulf) Lease Sale area.

TABLE 1

WELLS DRILLED

Well	Ocs #Y-0011	OCS #Y-0007	OCS #Y-0014 #1	OCS #Y-0050	OCS #Y-0046	Ocs #Y-0059
Vessel	SEDCO 706	ODECO Ocean Ranger	SEDCO 706	Alaskan Star	ODECO Ocean Bounty	Aleutian Key
Company	Shel 1	A. R. Co.	Shell, A.R.Co.	Exxon	Texaco	Gulf Oil
Location	148 °18'8.66" W Long. 59°52' 19.943" N Lat, Blk 106, Tract 42, 34.5 km ESE of Cape Suckling, 54 km WSW of Yakataga	Blk 72, 77.5 m WEL and 1 ,952.2 m SNL; 8 mi. S. of Yakataga 23 mi. W of Icy Cape	Blk 111, Lat. 59''53' 5", Long 142°53'03", 32.5 km SW of Cape Yakataga	Blk 284, 2,524' EWL and 2,958' N SL; 36 mi . SW of Cape Yakataga	Blk 241, Tract 116, 6,500' S and 115 mi. W of Yakutat, Lat. 59 °45'58" N, Long 142°58'5" W	Blk 329, Long 148°58' 33" W; Lat 59''40'25", 118 mi. N 84° Wof Yakutat
Water Depth	541 feet	250 feet	485 feet	585 feet	600 feet ± MLLW	615 feet/623 feet
Total Well Depth	13,565 feet	17,920 feet	13,598 feet	12,995 feet	15,013 feet	12,170 feet
Total Depth Date	1/6/77 Directional survey; coring	5/25/77 Directional survey; coring	5/30/77 Directional survey; coring	6/22/77 No directional survey; coring	6/12/77 Directional survey; coring	8/8/77 Directional survey; no coring
Well Spud	9/1/76	10/21/76	2/11/77	3/8/77	4/15/77	5/13/77
Well Completion	1/28/77	June 1977	6/19/77	7/8/77	7/15/77	8/16/77
Well Name	N.A.	Salome #1	Yvonne Structure	N.A.	N.A.	N.A.
Results	Dry Hole	Dry Hole	Dry Hole	Dry Hole	Dry Hole	Dry Hole
cost**	N.A.**	Approx. $23 million	N,A.**	N.A.**	N.A.**	N.A.**

**See text page 50 for a discussion of well cost s.

TABLE 1 (Cont.)

WELLS DRILLED

Well	OCS #Y-0014 #2	OCS #Y-0080	OCS #Y-0032	OCS #Y-0072	OCS #Y-0035
Vessel	SEDCO 706	Alaskan Star	ODDCO Ocean Bounty	Alaskan Star	Alaskan Star
Company	Shell and A. R. Co.	Exxon	Texaco	Exxon	Exxon
Location	Blk 111, 59°53'5", 142°53'3"; 32.5 km SW of Yakataga	Blk 343, Middleton Island, 2,000' WEL, 6,700' SNL, 20 miles SE of Kayak Island	Blk 162, Long 142°16'55" W, Lat. 59°50'42" N, 85 miles W of Yakutat, 3,500' N and 500' E from SW corner of Blk	613 m. S of N Line and 1877 m W of E Icy Bay 44	302.7 m E of W Line 307.7 m S of N Line Icy Bay Blk 165
Water Depth	480 feet	455 feet	230 feet ± MLLW	873 feet	184 feet
Total Wel 1 Depth	15,390 feet	13,507 feet	15,638 feet	9,835 feet	11,731 feet
Total Oepth Oate	8/31/77 Coring done	N.A.	N.A.	3/5/78	6/16/78
Well Spud	6/20/77	7/9/77	7/17/77	1/9/78	3/23/78
Well Completion	9/12/77	1/4/78	2/20/78	3/17/78	7/1/78
Wel 1 Name	Salome #2	N.A.	N.A.	N.A.	N.A.
Results	Dry Hole	Dry Hole	Dry Hole	Dry Hole	Dry Hole
cost**	N.A.**	N.A.**	N.A. **	N.A.**	N.A.**

**See text page 50 for a discussion of well costs.

TABLE 1 (Cent.)

WELLS DRILLED

Well	C. O. S. T./NEGOA*	C. O. S. T./LCI OCS #77-5*	C. O. S. T./Kodiak #1	C.O. S. T./Kodiak #2	C.O.S.T./Kodiak #3
Vessel	Glomar Conception	ODECO Ocean Ranger	SEDCO 708	SEDCO 708	SEDCO 708
Company	A.R.Co. , Sun Oil, Gulf, Amoco, Mobil, Pennzoil, Union, Marathon, Getty Oil , Amerada Hess, Phillips, Texaco, Tenneco, Superior Oil, Placid, Standard Oil of California, Continental, B.P. Alaska, Skelly, Shell, Di amend Shamrock, Exxon, Al -Aqua taine, Cities Service, Texas Eastern, American Petrofina	A.R.Co. , Phillips, Amoco, Gulf, Aminoil , B.P. Alaska, Cities Service, Chevron, Champl i n, Oepco, Freeport, Exxon, Getty, Hunt, Mobil, Murphy, Shell, Texaco, Union Oil of California	Sun Oi 1	Sun Oil	Sun Oil
Location	Tract 196, Blk 1328 N, 76 E; 1,828.8 m FWL, and 2,255.5 m FNL	81k 127 SN, 105 E, Tract 4890, 237 m FNL and 973 m FWL	61 N miles E of Kodiak	121 N miles E of Kodiak	54 N miles S of Kodiak
Water Depth	567 feet	214 feet	616 feet	465 feet	N.A.
Total Well Depth	5,100 feet	12,387 feet	8,517 feet	10,460 feet	9,357 feet
Total Depth Date	N.A.	9/9/77 Directional survey; tori ng	7/11/77	8/31/77	10/20/77
Wel 1 Spud	7/?2/77	6/10/77	5/25/77	7/22/77	9/13/77
Well Completion	10/9/75	9/24/77	7/17/77	9/8/77	10/25/77
Wel 1 Name	N.A.	N.A.	N.A.	N.A.	N.A.
Results	N.A.	N.A.	N.A.	N.A.	N.A.
cost**	Approx. $12 million	N.A. **	N.A. **	N.A.**	N.A. **

*C.O.S.T. stands for Continental Offshore Stratigraphic Test.
**See text page 50 for a discussion of well costs.

Note: Location of blocks shown on Figure 1.
Source: U.S.orological Surv[illegible], Oil and Gas [illegible]vision.

II. DRILLING VESSELS

Introduction

Table 2 summarizes all available information on the drilling vessels involved with exploratory drilling in the Northeast Gulf of Alaska and Lower Cook Inlet. Information listed in Table 1 includes the name of the vessel and owner, the type of vessel and approximate cost, as well as the place and year of construction, lease operator and lease rate. Also included where available, are fresh water production, crew size and quarters capacity, typical shift hours for crews as well as their home leave rotation. The drilling vessels fuel and fresh water consumption is also provided.

In all cases lease rate was confidential, however, a general discussion can be found on page 49 of Section IX. Some data was not available for all drilling vessels, therefore, we assumed that conditions are similar for most semi-submersible drilling vessels. (This excludes the Glomar Conception which is a self-propelled drillship.)

Figure 1 depicts the initial location of each drilling vessel upon arrival in Alaska and shows their movement to different drilling sites.

TABLE 2

DRILLING VESSELS

Name	Ocean Bounty	Ocean Ranger	SEDCO 706
Owner	ODECO	ODECO	SEDCO Marine, Inc.
Type	Semisubmersible, self-propelled	Semisubmersible	Semi submersible, self-propelled
cost	N.A.	$50 million	$46 million
Place of Construction	Mitsubishi Heavy Industries Hiroshima, Japan	Mitsubishi Heavy Industries Hiroshima, Japan	Kaiser Steel Corp. (Vellejo, California)
Year	1976	1976	1976
Lease Operator	Texaco	A.R.Co.	Shell, A.R.Co. , Mobil
Lease Rate	Confidential	Confidential	Confidential
Freshwater Production	N.A.	N.A.	600 gallons/hour
Crew Size	*	*	*
Quarters Capacity	82	100	96
Typical Shift Hours	12 hours on, 12 hours off	12 midnight to noon, noon to midnight	12 hours on, 12 hours off
Home Leave Rotation	28 days on, 28 days off	28 days on, 28 days off	14 or 28 days on, 14 or 28 days off
Rig Fuel Consumption	N.A.	5,100 gallons/day	N.A.
Freshwater Consumption	N.A.	24,800 gallons/day (9,500 gallons/day-personnel)	N.A.
Drilling Mud Consumption	N.A.	N.A.	N.A.
Wells Drilled	OCS-Y-0032 OCS-Y-0046	OCS-Y-0007 C.O.S.T./LCI OCS #77-5	OCS-Y-0011 OCS-Y-0014, #1 OCS-Y-0014, #2

*Crew size and personnel makeup of typical semisubmersible, including special crews, is discussed in Section VIII 2, "Employment Patterns."

TABLE 2 (Cont.)

DRILLING VESSELS

Name	Alaskan Star	Aleutian Key	Glomar Conception
Owner	Exxon/Western Oceanic	Key International Drilling Co., Ltd.	Global Marine Drilling Co.
Type	Semi submersible, self-propelled	Semi submersible	Drillship, self -propel led
cost	$45 to 50 million	N.A.	$7.7 million
Place of Construction	Mitsubishi Heavy Industries Hiroshima, Japan	Mitsui Shipbuilding Engineering Co. Tamano, Japan	Livingston Shipbuilding Orange, Texas
Year	1976	1976	1967
Lease Operator	Exxon	Gulf	A.R.Co. , SunOil , Mobil Pennzoil, Union, Marathon, Getty, Amerada Hess, Phillips, Texaco, Tenneco, Superios, Placid, Standard Oil of California, Continental , BDAK, Skelly, Shell, Diamond Shamrock, Exxon, Al -Aquataine, Cities Service, Texas Eastern, American Petrofina
Lease Rate	Confidential	Confidential	Confidential
Freshwater Production	N.A.	N.A.	300 gallons/hour
Crew Size	*	*	*
Quarters Capacity	100	79	70
Typical Shift Hours	12 midnight to noon, noon to midnight	12 hours on, 12 hours off	12 hours on, 12 hours off
Home Leave Rotation	28 days on, 2B days off	28 days on, 28 days off	14 or 28 days on, 14 or 28 days off
Rig Fuel Consumption	Approx. 5,100 gal./day	N.A.	Underway: 120 bbl/day On location drilling: 40 bbl /day
Freshwater Consumption	15,300 gallons/day	N.A.	Human Needs: 30 bbl/day Drilling: 500 bbl/day
Drilling Mud Consumption	N.A.	N.A.	N.A.
Wells Drilled	OCS-Y-0080; OCS-Y-0050 OCS-Y-0072; OCS-Y-0035	OCS-Y-0059	NEGOA C.O.S.T. Well #1
Comments		Sewage treatment plant that recycles water and garbage. Accumulated deck H_2O drains into holding tank and is treated for use as work water. Complete warehouse aboard has an inventory of $350,000 worth of spare parts.	

Note: Lease block locations shown on Figure 1.

Source: Personal communication, March 1, 1978, Dub Black, Atlantic Richfield, Anchorage, Alaska; Personal communication, January 8, 1978, Charles McKay, Atlantic Richfield Company; Personal communication, February 9, 1978, Tom Dossett, ODECO; Various journals including Alaska Industry, Offshore, World Oil, Alaska Construction and Oil and Petroleum Information Newsletter.

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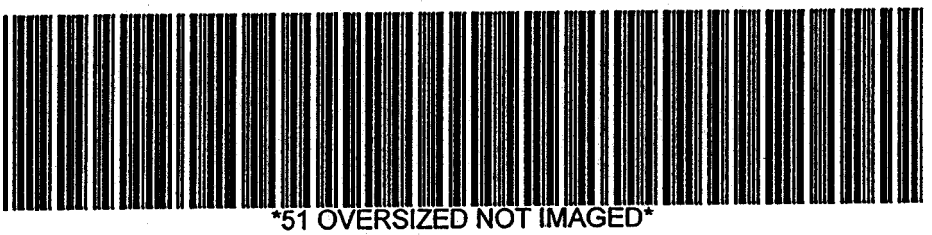

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III. SUPPLY VESSELS

Introduction

Table 3 summarizes information available on the supply vessels that serviced the drilling vessels doing exploratory drilling in the NEGOA and LCI lease sale areas. The supply vessel name, owner, dimensions, fuel consumption, and horsepower are provided. Table 3 also includes cargo capacity and personnel capacity as well as approximate cost, place of construction, year, crew size, typical shift hours and crew leave rotation. Where available shore location and drilling vessel serviced is also presented.

In most cases information was not available for all vessels, therefore, we assume information to be similar for a vessel of similar size and cost.

Vessel Name	Volunteer	Defender	Eagle	Enterprise	Northern Lights
Owner	Offshore Logistics	Offshore Logistics	Offshore Logistics	Offshore Logistics	Offshore Logistics
Dimensions	200 feet 1 ong, 1 ,200-ton weight	200 feet long	200 feet long, 1,200-ton weight	200 feet long, 1,200-ton weight	200 feet long
Fuel Consumption	4,500 to 7,000 gallons per day	4,500 to 7,000 gallons per day	4,500 to 7,000 gallons per day	4,500 to 7,000 gallons per day	*
Horsepower	6,160 hp	6,160 hp	6,500 to 7,040 hp	7,040 hp	6,200 hp
Cargo Capacity	Total of 1,000 tons--combination of: 500 tons H_2O, 400 tons fuel oil , 4,400 to 4,500 cu. ft. of dry mud (or Sachs) , 400 to 500 tons deck cargo	*	*	*	2,500 barrels fuel (42 gallons each) 400 barrels of potable H_2O, 4,000 barrels of rig H_2O, 4,800 cu. ft. of drilling mud and 600 tons deck cargo
Quarters	24	24	24	24	24
cost	$5 million	$5 million	$5 million	$5 million	$5 million
Place of Construction	Southern Shipbuilding co., Slidell, LA	Southern Shipbuilding co., Slidell, LA	McDermott Shipyards, LA	McOermott Shipyards, LA	McDermott Shipyards, LA
Year	Unknown	Unknown	Unknown	Unknown	Unknown
Crew Size	(by occupation) (12) have capacity for (24) 1 captain, 2 mates, 4 deck hands (2 able-bodied, 2 regular seamen), 1 cook, 1 chief engineer, 1 1st engineer, 1 2nd engineer, 1 alternate	*	*	*	*
Typical Shift Hours	Variable	Variable	Variable	Variable	Variable
Leave Rotation	40 days on/20 days off, if at all	40 days on/20 days off, if at all	40 days on/20 days off, if at all	40 days on/20 days off, if at all	40 days on/20 days off, if at all
Shore Locations (purpose)	Seward-Water and mud Yakutat-	Seward-Water and mud Yakutat-Other supplies	Seward-Water and mud Yakutat-Other supplies	Seward-Water and mud Yakutat-	Seward-Water and mud Homer-Serving LCI C.O.S.T. Well-Yakutat
Drilling Vessels Served	Ocean Ranger/ LCI C. O. S.T. Well Others unknown	N.A.	N.A.	N.A.	Ocean Ranger/LCI C.O.S.T. Well Others unknown

*Assumed

TABLE 3 (Cont.)

SUPPLY VESSELS

Vessel Name	Ranger	Regeant	Resolute	Ocean Marlin	Seahorse	Biehl Traveler
Owner	Offshore Logistics	Offshore Logistics	Offshore Logistics	Ocean Marine, Ltd.	Arthur Levy	Biehl Offshore, Inc.
Dimensions	200 feet long, 1,200-ton weight	200 feet long	200 feet long, 1 ,200-ton weight	**	**	210 feet, broad beam 144 feet
Fuel Consumption	4,500 to 7,000 gallons per day	4,500 to 7,000 gallons per day	4,500 to 7,000 gallons per day	**	**	N.A.
Horsepower	7,040 hp	6,500 to 7,040 hp	6,500 to 7,040 hp	**	**	N.A.
Cargo Capacity	*	*	*	**	**	180,000 gal of fuel
Personnel Capacity	24	24	24	**	**	N.A.
cost	$5 million	$5 million	$5 million	**	**	$8 million
Place of Construction	McDermott Shipyards, LA	McDermott Shipyards, LA	McDermott Shipyards, LA	**	**	Campbell Shipyards, San Diego, CA
Year	Unknown	Unknown	Unknown	**	**	1976
Crew Size	*	*	*	*	*	*
Typical Shift Hours	Variable	Variable	Variable	**	**	Variable
Leave Rotation	40 days on/20 days off, if at all	40 days on/20 days off, if at all	40 days on/20 days off, if at all	**	**	N.A.
Shore Locations (purpose)	Seward-Water and mud Yakutat-Other supplies	Seward-Water and mud Yakutat-Other supplies	Seward-Water and mud Yakutat-Other supplies	**	**	N.A.
Drilling Vessels Served	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

*Assumed to be similar to Volunteer
**Not available, but assumed to be similar to Offshore Logistics

Note: Frequency of trips to shore by specific vessels, period of activity and number of vessels per well drilled is unavailable. However, boats operating from Seward were expected to call 1 day out of 6; boats operating from Yakutat were expected to call 1 day out of 2. See Notice of SuPPort Activity for Exploration Program submitted by NEGOA operators.
Source: Personal communication, 9 February 1978, Birger Froiland, Offshore Logistics, Anchorage, Alaska; Petroleum Information Newsletter; Offshore magazine.

IV. HELICOPTERS

Introduction

Table 4 lists available information on helicopter support of the offshore drilling operations in NEGOA and LCI. Included in the table are type of helicopter and owner, cost, capacity on crew required to operate. Also, crew shifts, lease rate, rigs serviced, and shore bases utilized are addressed.

TABLE 4

HELICOPTERS

Type	Sikorski S61N	Bell 212
Owner	ERA, Evergreen	ERA, Evergreen
cost	Approx. $3 million	Approx. $1.2 million
Capacity	19 passengers or 4,000 lbs. cargo	9 passengers or 3,200 lbs. cargo
Crew	2 pilots 3 mechanics (nonflight service)	1 pilot
Crew Shift	14-hour duty day with maximum of 8 hours flying time 14 days on; 14 days off	Same
Lease Rate	Approx. $2,000/hour and standby	$985/hour
Rigs Serviced	All NEGOA rigs and LCI	N.A.
Shore Base Utilized	Yakutat, Yakutaga, Homer	Same

Source: Personal communication, March 6, 1978, Chuck Thompson, ERA Helicopters, Anchorage, Alaska; March 10, 1978, Jim Porter, Evergreen Helicopters, Anchorage, Alaska; 1 August, 1978, Walt Benard, Evergreen Helicopters, Anchorage, Alaska.

V. SHORE BASES

Introduction

Shore base information is summarized in Table 5. This information includes a description of facilities used, public services and charges, operations using each base and frequency of use. Also, the owner/operator of the facilities used and operation crew are discussed. The shore bases included in the discussion are Yakutat, Seward, Cape Yakataga, Homer and Nikiski.

TABLE 5

SHORE BASES

:ion	Description of Facilities	Public Services and Charges	Operations Using Base	Frequency of Use[1]	Owner/ Operator	Operatior Crew
:at :i Bay)	77-acre industrial park partially developed; 120-foot-dock with dolphins for barges and 200-foot supply boats; 75-ton crane; 8,300-square foot covered storage; housing for 48 men in transit; commercial hotel/ restaurant; diesel gen- eration on site; physical-chemical sewage treatment plant on site; bilge treatment plant; 250-lb/hr waste incinerator; fresh water supply; 7,800-foot runway, paved, IFR equipped; helicopter hangers	The shore base complex is a private develop- ment; airport is public, landing fees not available	Atlantic Richfield and Shell use dock complex; all use airport	Daily by supply boats and as needed by heli - copters for reasons of weather	Joint Venture between Kwaan and ARCO/Shell; airport is state-owned	Approx. 2 includes many 10Ca residents
'd/ irec- Bay	Alaska Railroad dock/ warehouse complex; dock space for up to 6 200-foot work boats; dockside crane; freshwater line and fuel line on dock; conduit for bulk loading mud and cement; bulk mud and cement storage (owned by Imco, Baroid, Magcobar, Halliburton); covered warehouse on dock	Water approx. $1 .25/1 ,000 gallons; dock fee approx. $125/ 24 hours (based on tonnage of vessel)	Exxon, Texaco, Gulf	Daily by work boats	U.S. Department of Transportation (Alaska Railroad)	Stevedore as needed
aga	Gravel airstrip (IFR); aviation fuel storage	None	Al 1	Daily by helicopters for crew changes and light freight	FAA	None
	Gravel airstrip; helicopter hangers; deepwater dock; freshwater/fuel line on dock	Water-$1 .50/ 1,000 gallons; dock fee approx. $125/24 hours	A. R. Co.	Daily by helicopters; approx. 7 days/month by supply boat	Municipality	N.A.
ki	Rig tenders dock; earth fill berth to handle barges and 200-foot class work boats; helicopter pad	Private	A. R. Co.	As needed; approx. 4 days/month	Crowley Maritime	N.A.

[1] ly boats operated from Seward and Yakutat for NEGOA operations. Typically two boats served each rig. One of those would call at least every other day at Yakutat if that was its base; or every 6th day at Seward if that was its At the peak of activity with six rigs and about 12 boats working, the two ports were used daily by supply boats. otice of Support Activity for Exploration Program.

e: Articles in Alaska Construction and Oil; Alaska Industries; World Oil; Offshore; Ocean Industry; and nal communications from Larry Farnam, City Manager at Homer, and Johnny Johnson, City Manager at Seward.

VI. SURVEYS AND SURVEY DATA

Introduction

Available information concerning geophysical surveys in the NEGOA and LCI lease sale areas is summarized in Table 6. The data presented includes year and location of survey, sponsor of survey, contractor, start and end dates and vessel as well as any available information on the survey. It should be noted that quite a little information was unavailable especially in early years.

TABLE 6

SURVEYS AND SURVEY DATA

Year	Location	Sponsor	Contractor	Start Date	End Date	Vessel	Available Information
1975	NEGOA	Group of 11	Seiscom Delta	7/25/75	N.A.	M/N American Delta 111	Kodiak shelf area, 2,000 mi.
1975	NEGOA	Group of 30	Digicon	5/20/75	N.A.	Doris Candies	Kodiak Shelf, 6,600 line mi.
1975	NEGOA	Amoco	Petty Ray	6/6/75 9/1/75	9/30/75 N.A.	Dabney Petty	2,500 miles of NEGOA and S. side of Alaska Peninsula
1975	NEGOA	Unknown	Aquatronics	6/30/75	7/15/75	Acquisition	Digital sparker
1975	NEGOA	Unknown	BB & N Geomarine			White Plume	Kodiak Shelf
1975	NEGOA	Unknown	BB & N Geomari ne	4/1 5/75 6[20/75	6/16/75 N.A.	Sea Bird	Kodiak Shelf, 5,000 miles
1975	NEGOA	Exxon	None	5/15/75	N.A.	Anna Bravo	Western rim of gulf
1975	NEGOA	A.R.Co.	Digicon	6/20/75	8/31/75	Westwind	
1975	NEGOA	U.S. Geological Survey	GS I	6/25/75	8/28/75	Cecil Green	Proposed area, 3,000-4,000 mi . 4B channel seismic program
1975	NEGOA	Shel 1	None	8/6/75	N.A.	Niobe	
1975	NEGOA	Unknown	GCA	7/10/75	N.A.	Bering Explorer	3,000 mi., 24 & 30 fold seismic program
1975	NEGOA	Texaco	None	8/20/75	N.A.	Trinity	
1975	NEGOA	Shell	General Oceanographic cs	8/15/75	N.A.	Sea Mark	
1975	NEGOA	Conoco	Western Geophysical	N.A.	8/25/75	Sitkin	
1975	NEGOA	Group of 12	Energy Analysis, Inc.	N.A.	N.A.	N.A.	12 companies, air gun, tie-in survey with Riou Bay #1
1975	NEGOA	Standard Oi 1 of California	Western Geophysical	8/13/75	8/22/75	Krystal	Tie-in with Riou Bay #1
1975	NEGOA	Gulf	None	5/25/75	N.A.	Hollis Hedberg	
1975	NEGOA	Unknown	GCA	6/1/75	6/24/75	Bering Explorer	1,000 miles
1975	NEGOA	Unknown	BB & N Geomarine	6/23/75	N.A.	Mediterranean Seal	Coring
1975	Lower Cook Inlet	Exxon	None	N.A.	N.A.	N.A.	
1975	Lower Cook Inlet	Shel 1	None	N.A.	N.A.	M/V Niobe	
1975	Lower Cook Inlet	Unknown	GCA	N.A.	N.A.	M/V Bering Explorer	

TABLE 6 (Cont.)

SURVEYS AND SURVEY DATA

Year	Location	Sponsor	Contractor	Start Date	End Date	Vessel	Available Information
1975	Lower Cook Inlet	Occidental Petroleum	Western Geophysical	N.A.	N.A.	M/V Sitkin	
1975	Lower Cook Inlet	Standard Oil of Cal ifornia	Western Geophysical	N.A.	N.A.	M/V Sitkin	With 11 other companies
1975	Lower Cook Inlet	Texaco	N.A.	N.A.	N.A.	M/V Trinity	
1976	NEGOA	Unknown	Petty Ray	8/21/76	10/3/76	Dabney E. Petty	Air gun
1976	NEGOA	Unknown	GS I	9/10/76	N.A.	Cecil Green	
1976	NEGOA	Unknown	BB & N Geomarine	6/8/76	10/3/76	Alaska Trader	
1976	NEGOA	Shel 1		6/16/76	7/2/76	Niobe	Air gun
1976	NEGOA	Unknown	BB & N Geomari ne	6/29/76 7/21/76	7/ 19/76 9/13/76	Mediterranean Seal	Soil boring
1976	NEGOA	Unknown	Petty Ray	7/20/76	N.A.	Robray I	
1976	NEGOA	U.S. Geological Survey	Petty Ray	8/18/76	N.A.	Sitkin	Sparker
1976	NEGOA	Decca Survey Systems		7/76	9/3/76	Sea Transporter	High resolution in Icy Bay & Kayak Is., 4,000 miles
1976	NEGOA	Unknown	General Oceanographic cs	6/8/76	N.A.	Alaska Trader	
1976	Lower Cook Inlet	Shel 1	None	4/25/76 9/1/76	10/7/76 N.A.	Niobe	Air gun
1976	Lower Cook Inlet	Unknown	Petty Ray	9/25/76	10/1/76	Robray I	
1976	Lower Cook Inlet	U.S. Geological Survey	Petty Ray	9/28/76	10/15/76	Sitkin	Sparker
1976	Lower Cook Inlet	U.S. Geological Survey	Petty Ray	9/10/76	10/6/76	Greve	Sparker
1976	Lower Cook Inlet	A. R. Co.	GS I	8/24/76 10/17/76	9/5/76 10/30/76	Cecil Green	Air gun
1976	Lower Cook Inlet	Unknown	GCA	4/3/76 6/6/76 9/1/76	4/26/76 7/17/76 9/7/76	Bering Explorer	Sparker, 2,300 miles, 650 mile fill-in survey
1976	Lower Cook Inlet	Unknown	GSI	9/10/76	10/15/76	Cecil Green	

TABLE 6 (Cont.)

SURVEYS AND SURVEY DATA

Year	Location	Sponsor	Contractor	Start Date	End Date	Vessel	Available Information
1977	Lower Cook Inlet	A.R.Co.	GS I	5/9/77	5/15/77	Cecil H. Green	Air gun
1977	Lower Cook Inlet	Marathon LL & E	GCA	5/6/77	5/11/77	Bering Explorer	Air gun
1977	Lower Cook Inlet	Shel 1	GCA	3/13/77	4/7/77	Bering Explorer	Air gun
1977	Lower Cook Inlet	Unknown	GSI	6/10/77	7/20/77	Cecil H. Green	Air gun
1977	Lower Cook Inlet	Gulf	None	5/22/77	8/1/77	Hollis Hedbery	Air gun
1977	Lower Cook Inlet	Unknown	GCA	6/20/77	6/30/77	Bering Explorer	Sparker
1977	Lower Cook Inlet	Shel 1	None	5/16/77	5/30/77	Niobe	Air gun
1977	NEGOA	Shel 1	None	5/12/77	6/12/77	Niobe	Air gun, E. of St. Elias
1977	NEGOA	A. R. Co.	GS I	4/22/77	5/1/77	Cecil H. Green	Cover 125 miles, E. of St. Elias

Source: Marine Seismic Report, Offshore magazine.

VII. PERMITS

Introduction

All permits issued by U.S. Geological Survey are summarized in Table 7. These include application for permit to drill, notice of change of plans, notice to plugback and sidetrack, notice to pull or alter casing, permit to abandon and notice of plug and abandon.

In addition to the required U.S. Geological Survey exploratory drilling permits, all companies doing exploratory drilling in the Northeast Gulf of Alaska (sale #39) area and Lower Cook Inlet area are required to obtain a letter of authorization from the Corps of Engineers. At the start of activity in the NEGOA region and after extensive research and review, a general activities drilling permit was issued. This represents a policy statement for the Corp. of Engineers and includes special stipulations for drilling in the Gulf of Alaska. When a company desires to do exploratory drilling in the NEGOA area it requests a letter of authorization and included in this letter is the general activities permit. A company must apply for a letter of authorization for each well drilled, just as they must apply for a permit from U.S. Geological Survey for each well drilled. Copies of Corp. of Engineers permits were unavailable.

Lease Designation	Company(s)	Location	Permit and Notices	Oate Applied	Date Issued
OCS-77-5	A.R.Co. & Others	Lower Cook Inlet C. O.S. T. Well, Tract 489	Application to Drill Abandon Notice of Plug and Abandon	6/2/76 9/15/77 10/5/77	6/3/77 9/19/77
OCS-Y-0014	Shel 1 Oi 1 Company	Block 111, Icy Bay	Application to Drill Abandon Notice of Plug and Abandon	10/15/76 6/20/77 7/22/77	1/27/77
OCS-Y-0007	A.R.Co.	Block 72, Icy Bay	Application to Drill Drill to 17,000 feet Plugback and Sidetrack Drill to 18,000 feet Drill to 20,000 feet Abandon Notice of Plug and Abandon	 3/8/77 4/13/77 4/28/77 5/20/77 5/24/77	9/8/76 3/31/77 4/14/77 4/29/77 5/23/77 5/26/77
OCS-Y-0059	Gulf Oil	Block 329, Icy Bay	Application to Drill Notice of Plug and Abandon	1/14/77 1/9/78	4/26/77
OCS-Y-0050	Exxon Corp.	Block 284, Icy Bay	Application to Drill Exact Well Location Notice File Temporary Log Notice Abandon Notice of Plug and Abandon	12/14/76 3/30/77 4/7/77 7/11/77 12/8/77	3/2/77 3/31/77 4/8/77 7/15/77
OCS-Y-0014	Shel 1 Oi 1 Company	Block 111, Icy Bay	Application to Drill Notice to Change Well Plan Notice of Extend Interval of Directional Surveys Notice to Plug and Abandon	6/20/77 7/12/77 8/1/77 10/12/77	6/24/77 7/15/77 8/2/77
OCS-Y-0032	Texaco, Inc.	Block 162, Icy Bay	Application to Drill Notice of Change of Plans Notice of Plugback and Sidetrack Notice of Change of Plans - Deepen Notice of Change of Plans	12/2/76 9/12/77 10/7/77 12/15/77 1/13/78	5/23/77 9/13/77 10/12/77 12/15/77 1/16/78
OSC-Y-0011	Shel 1 Oi 1 Company	Block 42, Icy Bay	Application to Drill Notice to Move Location Notice of Change of Plans Notice to Pull or Alter Casing Request for Departure on Blind Ram Test Notice to Pull or Alter Casing Abandon Notice to Plug and Abandon	7/27/76 8/1 7/76 9/23/76 10/4/76 10/15/76 12/17/76 1/18/77 3/14/77	8/27/ 76 8/27/76 9/28/76 10/7/76 10/20/76 12/21/76 1/19/77
OCS-Y-0080	Exxon Corp.	Block 343, Middleton Is.	Application to Drill	2/17/77	6/10/77
OCS-Y-0046	Texaco, Inc.	Block 241, Icy Bay	Application to Drill Notice of Change of Plans Notice to Plug and Abandon	12/2/76 3/30/77 10/5/77	3/18/77 4/12/77
OCS-Y-0035	Exxon Corp.	Blk. 165, Icy Bay	Application to Drill	12/28/77	N/A.

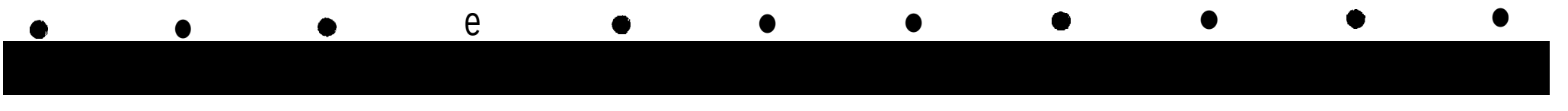
TABLE 7 (Cont.)

PERMITS
U.S. GEOLOGICAL SURVEY PERMITS TO DRILL NOT YET UTILIZED

Lease Designation	Company	Location	Date Applied	Date Issued
OCS-Y-0007	A.R.Co.	*Blk. 72 Tract 39.39	6/18/76	9/8/76
OCS-Y-0007	A.R.Co.	*Blk. 72 Tract 39.30	11/19/76	N.A.
OCS-Y-0007	A.R.Co.	*Blk. 72 Tract 39.30	12/22/76	N.A.
OCS-Y-0008	A.R.Co.	Blk. 73 Tract 39-31	12/23/76	N.A.
OCS-Y-0033	A.R.Co.	Blk. 163 Tract 39-79	7/15/76	1/21/77
OCS-Y-0097	A.R.Co.	Blk. 401, Icy Bay	11/21/77	N.A.
OCS-Y-0057	Exxon Corp.	Blk. 327, Icy Bay	3/29/77	N.A.
OCS-Y-0066	Exxon Corp.	Blk. 370, Icy Bay	8/11/77	N.A.
OCS-Y-0043	Exxon Corp.	Blk. 199, Icy Bay	5/19/77	N.A.
OCS-Y-0086	Marathon Oil	Blk. 318, Seldovia	2/21/78	N.A.
OCS-Y-0028	Shell Oil	Tract 66	8/4/76	N.A.

*Different locations within the same block.

Source: U.S. Geological Survey, Oil and Gas Division. Lease Block locations shown on Figure 1.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VIII. EMPLOYMENT

Introduction

Obtaining an actual head count of the people directly employed in petroleum-related OCS activity in the Gulf of Alaska and Lower Cook Inlet Lease Sale areas over the past three years is a virtually impossible task. This is because of the large number of contractors that were involved in the many tasks associated with the exploration program in a frontier area. It has been possible only to estimate total direct (1) employment within the scope of this study. These estimates have been derived from industry interviews and published reports about actual employment by representative firms providing oil field services in the Gulf of Alaska or Lower Cook Inlet between April 1975 and June 1978.

Before describing employment patterns in each major oil field service industry, it is necessary to define terms and clarify some manpower concepts.

"Employment" is used in this report to mean the number of employees -- that is, individuals -- who work at OCS-related jobs. The term "job" refers to a position such as driller, roustabout, or diver, rather than to the individual who holds the position. Employment in oil field service industries is usually much larger than the number of jobs or positions. This is so because there is typically more than one shift, and because some employees are usually off duty on home leave rotation. Employment can be determined by the following simple formula:

$$\text{employment} = \text{number of jobs} \times \text{number of shifts/day} \times \text{rotation factor}$$

where the rotation factor $= \left(1 + \frac{\text{days off dut}\text{,}}{\text{days on duty}}\right)$

(1) No attempt has been made to identify or quantify indirect employment generated by OCS exploration activity. Indirect employment means employment that is induced by and supports the contracting firms that interface directly with drilling activity. Indirect employment is typically estimated by means of a regional employment multiplier.

Assume, for example, that a new task creates 10 positions; the task requires two crews[2] that each work a 12-hour shift per day; and the men will work two weeks and take one off. In this case, total employment equals 30.

$$\text{employment} = 10 \text{ jobs} \times 2 \text{ shifts} \times \left(1 + \frac{7}{14}\right)$$

$$= 10 \times 2 \times 1.5$$

$$= 30$$

It is important to note that this employment of 30 people may not represent new employment, even though the jobs themselves were new. That is, the men may have been employed at other tasks and were simply reassigned to a new task. Thus, a new task may or may not give rise to an increase in net employment at the local or regional level. Furthermore, net employment at the local or regional level may not represent net employment at the national or international level. It is apparent, for example, that OCS petroleum exploration activity in Alaska created little net employment at the state level and probably little at higher levels as well.

Consider the case of administrative personnel of the oil companies that drilled wildcat wells in the Gulf of Alaska between 1975 and 1978 (these companies are referred to as the "operators"). The companies created task forces or otherwise assigned staff to the drilling programs. It is doubtful that existing professional staffs were augmented by new hires. If so, the new hiring probably reflected planning for an expanded corporate exploration program worldwide. This pattern of employment is also followed by the major oil field service contractors. These firms operate internationally with more or less permanent crews that travel wherever there is oil drilling activity. Thus, overall net employment created by a regional exploration program is a function of the growth of international petroleum exploration.

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(2) "Crew" refers to a set of jobs or positions, as for example a drilling crew.

Employment is expressed most meaningfully as man-months or man-years (a "man-month" is the employment of one man for one month; a "man-year" is the employment of one man for one year). These units of measure are necessary to compare jobs that vary in duration. Suppose a project had three components: component A employed 100 men for two months; component B employed 50 men for three months; and component C employed 80 men for 12 months. To say that the project resulted in employment of 230 is to say little about it because there is no indication of how long the employment lasted. For example, although component C employed only 80 men, it was responsible for over four times as much employment as component A, which employed 100 men but for a much shorter period. Thus, the total project is best described as having created 1,310 man-months, or 109 man-years, of employment.

In our example, peak employment may or may not have been 230 men. A peak of 230 would have existed only if all three components were underway simultaneous with maximum manpower loading. Construction projects usually begin with a small work force which gradually increases to a maximum and then declines as the project is completed. If component C of our hypothetical project was a construction project, for example, few of the 80 men would have worked the full 12 months, so the component would have generated significantly less employment than 960 man-months, and peak employment would have been less than the theoretical maximum of 230.

Employment Patterns

This section contains a summary of the available information about employment generated in the major oil field service industries. The operator typically performs only a limited supervisory and administrative function; it contracts with oil field service firms to perform virtually all of the major drilling and logistic functions. Some services may be provided on a subcontract basis through one of the larger service companies, but most firms have prime contracts with the operator. Most of the information that follows was obtained from a major firm in each service industry.

OIL COMPANY ADMINISTRATION

The only published information about the oil company administrative personnel assigned to Gulf of Alaska operations is the Notice of Support Activity for Exploration Program (Notice) which is required of each company prior to drilling by U.S.G.S. lease stipulation No. 5. The following are excerpts of employment from the Notice filed by each oil company that operated in the Gulf of Alaska:

Exxon:

Exxon Anchorage	
Manager	1
Operations Superintendent	1
Engineers	4
Material Man	1
Geologists	1
Secretaries	3*
Accountant	1*
Radio Operators	2*
	14

*Local hires

Shell: "People directly involved with the offshore drilling unit are estimated as follows . . . Shell Personnel - 10."

Texaco: "It is estimated that there will be four Texaco employees engaged in onshore support activities and transportation. One will be located in Seward and three will be located in Anchorage. Texaco will have one or two drilling foremen assigned to the drilling operation and based on the drilling vessel and residing in California on days off."

Atlantic Richfield:

"Eight members of the present Anchorage/Kenai staff of Atlantic Richfield Company will follow this program giving offshore technical and logistic support. There will be a full-time Logistics Supervisor position in Homer, filled by two people on a rotational basis . . .

In addition to the support and transportation personnel, the exploration program will require an onsite staff at the well site as follows:

Atlantic Richfield Company personnel -
Supervisors and Technical 8"

Gulf: "The approximate number of personnel or persons who will be engaged in onshore support activities and transportation is as follows:

Gulf Oil Company 4"

(Gulf also identified seven supervisory and five clerical and miscellaneous positions. However, it is not clear if these would be employed by the operator or a contractor).

It should be noted that this employment cannot be accounted for on a "per rig" basis. It lasts as long as the oil company has an exploration program underway.

DRILLING CONTRACTORS

It is important to note that only a portion of the total population of a drilling vessel, either semi-submersible or drillship, is employed by the drilling contractor. The balance of people on board the rig are employed by oil service contractors and by the operator, who will have one or more geologists and supervisory personnel on board. Food and room service is typically included in a lease agreement between the

drilling contractor and operator, although this function is subcontracted to a catering company. Of the 60 or more people who may be on board an operating drilling vessel at one time, 45 or fewer will be in the direct employ of the drilling contractor. These employees compose the drilling crew and ship operating crew. There are an equal number of employees on home leave rotation. In addition to shipboard employment, drilling contractors maintain a small administrative and support staff on shore.

Table 8 was provided by Global Marine Drilling Company, which owns the Glomar Conception that drilled the Gulf of Alaska C.O.S.T. well.

Offshore rigs drill 24 hours per day. The basic drilling crew on this drill ship is composed of 12 positions: one each supervisor, drilling foreman, driller, derrickman, assistant derrickman, crane operator, and three each roughnecks and roustabouts. These drilling crews typically work 12-hour shifts from midnight to noon or noon to midnight. Rig mechanics, electricians, welders, and storekeepers work a 12-hour shift from 6:00 a.m. to 6:00 p.m.

ODECO (Ocean Drilling and Exploration Company) provided the information in Table 9. This table and Table 1 illustrate the basic similarity of drilling vessel manpower requirements, even though nomenclature varies somewhat.

Offshore crews employed by drilling contractors typically work for the same number of days that they have off. ODECO reported a 28-day rotation schedule with half of the shipboard employees changing every seven days. SEDCO used a 21-day rotation schedule. Thus, the rotation factor for drilling crews is two, so total employment is roughly between 70 and 80 for each drilling contractor*.

* Employment 78 is derived from data in Table 1 as follows (catering and onshore personnel omitted):
(12 jobs x2 shifts + 4 jobs x 1 shift + 11 jobs x shift) x 2 rotation factor = 78
Employment of 68 is derived from Table 2 as follows
(12 jobs x 2 shifts + 5 jobs x 1 shift + 5 jobs x 1 shift) x 2 rotation factor = 68

TABLE 8

EMPLOYMENT ON DRILLSHIP GLOMAR CONCEPTION

Classification	Number	Personnel On Board Vessel
A. Onshore Personnel		
Manager	1	
Materialsman	1	
Accountant	1	
Secretary	1	
Subtotal	4	
B. Drilling Personnel		
Superintendent	1	0.5
Assistant Superintendent	1	0.5
Subsea Engineer	1	As Required
Drilling Foremen	4	2.0
Driller	4	2.0
Derrickmen	4	2.0
Assistant Derrickmen	4	2.0
Roughneck	12	6.0
Roustabout	12	6.0
Crane Operator	4	2.0
Rig Mechanic	2	1.0
Electrician	2	1.0
Welder	2	1.0
Storekeeper	2	1.0
Subtotal	55	27.0
C. Marine Personnel		
Captain	1	0.5
Alternate Captain	1	0.5
Chief Engineer	1	0.5
Alternate Chief Engineer	1	0.5
Assistant Engineer	4	2.0
Radiomen	2	1.0
Seamen	8	4.0
Oiler	4	2.0
Subtotal	22	11.0
D. Catering Personnel		
Day Cook	2	1.0
Night Cook	2	1.0
Utility Men	10	5.0
Subtotal	14	7.0
TOTAL	95	45.0

Source: Global Marine Drilling Company

TABLE 9

TYPICAL DRILLING COMPANY EMPLOYMENT ON OCEAN RANGER AND OCEAN BOUNTY

ODECO

Drilling Crew		Ship Crew	
2 tool pushers		1 barge master	
2 drillers		2 control room operators	1 shift
2 derickmen	2 shifts of 12 positions	2 motormen	
8 floormen		5	
2 crane operators			
8 roustabouts			
2 rig mechanics			
2 electricians	1 shift		
1 assistant tool pusher			
29			

Source: ODECO, Inc.

These numbers can vary somewhat with drilling conditions and drilling problems.

Point of hire for drilling contractors was the personnel office(s) of the contractor, usually in towns of the Gulf of Mexico coast or Pacific coast United States. Virtually no Alaska residents were employed on these vessels. Two residents of Yakutat were reported to be employed on the drilling vessel Ocean Ranger which was on contract to A.R.Co. (3) An important factor in the point of hire for offshore drilling crews may be unionization. Alaska oilfield workers are organized by the Alaska Roughnecks and Drillers Association, an affiliate of the Teamsters Local No. 959. Pay scale and perquisites are substantially larger onshore in Alaska (both union jobs and non-union jobs) than were paid to offshore workers. Apparently an aggressive attempt was made by the union to organize the offshore workers and an equally agressive effort was made by contractors to thwart the union. (4) As a practical matter, the hiring of Alaska resident drillers could only have been done at union pay scale.

Onshore administrative staffs of the drilling contractors appear to have been limited to about a half dozen employees. ODECO, which had two rigs working in Alaskan waters, reported an operations manager, two rig supervisors, an administrative manager, and two secretaries (six employees total), all of whom, except perhaps the secretaries, were temporarily transferred to Alaska. Exxon Company, U.S.A. reported in its Notice of Support Activity the following onshore personnel of Western Oceanic, Inc. (Owner of Alaskan Star vessel):

Manager	1
Administrative Supervisor	1
Superintendent	1
Material Supervisor	1
Steno-receptionist	1*
Accounting Clerk	1*
Expediter	1*

* Local hires

(3) Personal communication, January 8, 1978, Charles McKay, Atlantic Richfield Company.

(4) Personal communication February 28, 1978, Bill Hackl in, business agent, Alaska Roughnecks and Drillers Association.

Other operators reported similar administrative staff sizes for Anchorage-based personnel of their drilling contractors.

SUPPLY BOATS

Several contractors operated supply vessels in support of drilling operations in the northeast Gulf of Alaska, including Walter Levey, Biehl (Smith & Lloyd), and Offshore Logistics. The boats are of a generally similar design and employment patterns are standard. Offshore Logistics provided the following information about manpower requirements on a typical 200-foot class work boat(5):

Captain	1
Mates	2
Deck Hands	4
Cook	1
Chief Engineer	1
1st Engineer	1
2nd Engineer	1
Mechanic	1
Radioman	1 (provided by oil company)
	13

Each boat has a 13-man crew which is available for duty 24-hours per day (1 shift). Crews are on duty 40 days and off duty 20 days. Total employment per boat is approximately 20 (13 x 1 x 1.5 = 19.5). Typically 2 boats serve each rig with one standing by at all times to evacuate the rig in case of fire or other accident.

Supply boat contractors hired their crews from Gulf of Mexico coast and Pacific west coast port cities.

CATERING SERVICES

Caterers provide food and room service for drilling vessel crews, oil company personnel, and oil field service contractors ("third party"

75) Personal communication, February 9, 1978, Birger Froiland, Offshore Logistics, Anchorage, Alaska.

personnel) who live onboard the rig. The two major caterers serving the oilfield are A.R.A. Services and Universal Services, Inc. A typical catering crew consists of seven positions(6):

Chef/Manager	1
Night Cook & Baker	1
Galley Hands	5
	7

Four men work a day shift, two men work a night shift, and one man with miscellaneous tasks including laundry works either day or night shift, depending on need.

A.R.A. Services, which had several contracts on rigs operating in the Gulf of Alaska, reported that their employees worked 28 days on and took 14 days off (rotation factor of 1.5). Thus, catering employment per rig is approximately 11 (7 x 1 x 1.5 = 10.5).

A.R.A. Services also reported that catering company employees working in offshore waters were not covered by union contracts. The oil companies did not recognize agreements between the Culinary Workers Union and operators covering Upper Cook Inlet oil production platforms.

Point of hire for A.R.A. Services was Gulf of Mexico coast and Pacific coast cities, and it is assumed that the other catering contractors also had non-Alaskan points of hire for offshore crews. Like other oilfield contractors, A.R.A. Services attempts to keep regular employees who are used around the world as needed. Catering contractors require an onshore expediter/supervisor in addition to some contract freight and handling labor.

WEATHER FORECASTING

Most of the drilling vessels that operated in the Gulf of Alaska purchased weather forecasting services. Two firms with weather forecasting contracts

(6) Personal communication, February 17, 1978, Dave Ribachi, A.R.A. Services, Anchorage, Alaska.

were Dames & Moore and Oceanroutes, Inc. According to Darnes & Moore[7], each vessel had two weather observers aboard (1 position x 2 shifts). In addition, an Anchorage forecasting office was required that employed five people at the peak of activity. The forecasting office could service several vessels. A total employment of 4 per rig can be assumed.

Alaska residents were hired by Dames & Moore for both forecasting and observing.

HELICOPTER SUPPORT

Crew changes and light cargo service were provided to the rigs by helicopter. Two firms with permanent Anchorage bases, ERA Helicopters and Evergreen Helicopters, supplied contract helicopter service to offshore rigs. One helicopter was assigned to each rig, although a back-up craft was always available. According to ERA Helicopters, two pilots are required in flight and three mechanics are required per machine. Crews worked 14 days on and 14 days off (rotation factor of 2).[8] Thus, each offshore rig would account for a total employment of 10 (2 x 1 + 3 x 1) x 2 = 10.

Both ERA and Evergreen reported that only Alaska residents were employed for offshore support operations.

MUD ENGINEERING

Mud engineering and mud logging may or may not be provided by the same firm. The mud engineering firms supply the drilling mud. Bairod and Magcobar were the two major mud engineering firms active in the Gulf of Alaska. One engineering position is required during drilling. According

(7) Personal communication, February 20, 1978, Charles Fahl, Dames & Moore, Anchorage.

(8) Personal communication, March 6, 1978, Chuck Thompson, ERA Helicopters, Anchorage, Alaska, and March 10, 1978, Jim Porter, Evergreen Helicopters, Anchorage, Alaska.

to information obtained from Magcobar, one man fills the position. (9) He is on call 24 hour/day. His work schedule is 7 days on duty and 7 days off duty (rotation factor of 2). Thus, each rig accounts for employment of two mud engineers (1 position x 1 shift x 2 = 2).

Mud engineering firms employ full-time permanent employees. If manpower is not available from the local office, men will be transferred from other offices. Magcobar, with contracts in upper Cook Inlet and the North Slope, reported a staff of 22 full-time engineers in Alaska.

WELL LOGGING

Well logging services include mud logging and electric logging. The former is provided by a firm such as Baroid (which might also supply mud and mud engineering); the latter by a firm such as Schlumberger. Mud logging typically requires two men on board the drilling rig, each working a 12-hour shift.(10) Electric logging does not require a permanent crew aboard the vessel. Schlumberger reported that its contracts with operators required three men assigned to each rig who would provide services as required. A typical trip to the rig for the three men would require about 5 days. Two or more trips might be made to the rig per month by the three-man crew. Special problems could require more frequent service.

Total employment per rig accounted for by the well logging function is seven (mud = 1 position x 2 shifts x 2 rotation factor = 4; electric = 3 positions x 1 shift x O rotation factor = 3).

Well logging service contractors employ permanent full-time employees and most of those working in the Gulf of Alaska were Alaska residents.

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(9) Personal communication, February 27, 1978, Ken Kendrick, Magcobar, Anchorage, Alaska.

(10) Personal communication, March 3, 1978, representative Schlumberger, Anchorage, Alaska.

COMPLETION SERVICE

Among the completion services, only cementing gives rise to significant offshore employment during exploration drilling. Dowell and Halliburton are the major cementing service competitors in Alaska. According to information obtained from Halliburton, one engineer is assigned to a rig on a full-time basis.(11) He is on call 24 hours per day. A typical schedule is 21 days on and 21 days off; thus cementing services account for employment of two men per rig (1 position x 1 shift x 2 rotation factor = 2).

Completion service contractors employ permanent full-time employees and most of those working in the Gulf of Alaska were Alaska residents.

DIVING

Diving services involve about seven men per rig who must be on call at all times. However, only two men live on the drilling vessel full time; they maintain and ready equipment between dives. According to the firm Oceaneering, only two or three dives will be made per month.(12) Diving accounts for employment of seven men per rig (7 positions x 1 shift x 0 rotation factor).

Oceaneering is based in California and used divers who were from out of state. An Alaska-based f rm would presumably have Alaska residents in its employ.

PREDRILLING ENVIRONMENTAL STUDIES

U.S.G.S. lease stipulations require two types of environmental surveys prior to spudding a well. One is a marine biological survey involving

(11) Personal communication, February 24, 1978, Max Fritzel, Halliburton, Anchorage, Alaska.

(12) Personal communication, February 22, 1978, Jack Strickland, Oceaneering Anchorage, Alaska.

sampling and identification of organisms, and a shallow geological seismic survey to identify drilling hazards. These surveys are often done cooperatively by all of the oil companies that contemplate offshore drilling. Thus, a large number of blocks may be cleared for drilling through one program of surveys. C.O.S.T. wells may involve more extensive surveys. Dames & Moore conducted the biological surveys for the Lower Cook Inlet C.O.S.T. well. Over 5,000 man-hours, or approximately 30 man-months, were expended in the effort. Biological and geophysical surveys are currently being conducted by Dames & Moore in lower Cook Inlet. These surveys are being carried out on five leased blocks that will presumably be drilled. Thus, the manpower requirements presented below may be considered roughly as the manpower requirements per well.

Biological Survey

Position	Employees	Length of Employment	Man-months
Project Manager/Scientist	1	2.5 months	2.5
Technician/Scientists	3	0.25 months	0.75
Boat Crew	3	0.25 months	0.75
Navigator	1	0.25 months	0.25
			4.25

Shallow Geological Hazard Survey

Project Manager/Scientist	1	2.5 months	2.5
Geophysical Technicians	8	0.5 months	4.0
Boat Crew	4	0.5 months	2.0
Navigator	1	0.5 months	0.5
			9.0

(13) Personal communication, April 10, 1978, Jon Houghton, Dames & Moore, Seattle, Washington.

The length of time required for oceanographic fieldwork of this type is very much dependent upon weather conditions. The jobs involve a single shift with no significant rotation factor.

Geophysical Surveys

Considerable geophysical survey work preceeded leasing and drilling in the Gulf of Alaska and Lower Cook Inlet. A boat can shoot an average of about 20 miles of seismic lines per day. Typical employment on geophysical boats is as follows, according to a representative of Geophysical Corporation of America (GCA)[14]:

Captain	1
Cook	1
Boat Crew	5
Geophysical Technicians and Navigators	18
	25

These jobs involve one shift and rotation of 20 days on duty and 20 days off duty. Thus employment is 50 (25 x 1 x 2) for a boat working full time. However, Table 6 indicates that the boats were active only sporatically for short periods in the Gulf of Alaska and Lower Cook Inlet, so to avoid inflating employment from this source we shall use the figure of 25 crewmen per boat instead of 50 to calculate total man months in this area.

Geophysical firms also requ re at least one onshore expediter/ radioman and several maintained smal Anchorage offices with a project supervisor and clerical staff.

GCA reported that its boat crew was from outside Alaska but that its geophysical crew was "generally" Alaska residents.

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(14) Personal communication, March 6, 1978, representative of Geophysical Corporation of America, Boulder, Colorado.

MISCELLANEOUS ADDITIONAL EMPLOYMENT

OCS exploration activity generated significant employment in addition to that discussed above. However, virtually no published information is available about the magnitude of this employment. Miscellaneous employment was created in the areas of transportation (truck, rail, and ocean barge), communications, contract and force account construction, and longshoring. Heavy cargo, such as casing, drill pipe, wellhead equipment, mud, and cement were shipped by ocean-going barge directly to Yakutat and Seward. Some supplies and material also reached Seward by rail from Anchorage, Also, cargo was sent to Homer and Seward by truck from Anchorage and from Nikiski where oil field service vendors maintain supply yards.

Radio communication for offshore rigs, work boats, and helicopters required the installation and maintenance of equipment onshore and offshore. Some operators (Atlantic Richfield, for example) with offices in Alaska were able to provide communication service with fewer outside contractors than the oil companies without permanent local offices (Texaco and Gulf, for example). ([15])

Considerable construction was required to prepare the shore bases at Yakutaga, where airport improvements were necessary, and Yakutat, where a new dock, helicopter hangers, and other facilities were built. Communication sites also required contract construction labor. The main contractors at the Yakutat site for Shell and Atlantic Richfield were Green Construction and V.E. Construction. Thirty-six workers were reported on the job during site preparation in Yakutat. Twenty-three employees operated the base.

Longshoring employment was created at Seward and to a lesser extent at Homer and Nikiski.

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(15) Personal communication, March 1, 1978, Dub Black, Atlantic Richfield, Anchorage, Alaska.

SUMMARY

An attempt to summarize the total direct employment created by OCS exploration activity in Alaska between April 1975 and June 1978 may be made by estimating total employment per well. Most of the foregoing manpower requirements (with the exception of geophysical operations and administrative staff of the oil companies) was presented on a "per rig" basis. If it is assumed that the drilling of each well averaged 4 months, including the time required to position and anchor the rig, then each well would account for some 548 man-months of employment by service industry contractors (that is, total employment excluding operator's administrative staff, geophysical surveys, and miscellaneous employment) (see Table 10). A total of 13 wells were drilled between April 1975 and June 1978, including C.O.S.T. wells in the NEGOA and LCI. Note that the C.O.S.T.Wells on the Kodiak OCS are not included in this analysis. Therefore, some 8,645 man-months of employment were created for oil field contractors. If we assume that the operator's administrative staff averaged 10 people per company (five companies) and that this employment lasted 30 months, then an additional 1,500 man-months of employment were created, for a subtotal of 10,145.

Available information about geophysical employment permits only a rough estimate of the total man-months of work generated by geophysical exploration between the study dates. Although the information in Table 6 is incomplete, it indicates that at least 50 surveys were conducted of an average length of about 1.4 months, which translates into 1,960 man-months of employment on the basis of 28 workers per survey (25 onboard, 1 expediter, 2 administrative).

There is only impressionistic and anecdotal evidence upon which to base an estimate of miscellaneous employment in the construction, communication, and transportation industries. It seems safe to assume that this employment was in the neighborhood of 2,000 man-months, *or* roughly 20 percent of related employment in the petroleum and service industries.

On the basis of these estimates, we conclude that total direct employment associated with OCS petroleum exploration in Alaska between April 1975 and June 1978 is approximately 14,105 man-months, or approximately 1,175 man-years (8,645 + 1,500 + 1,960 + 2,000 = 14,105; 14,105 ÷ 12 = 1,175).

TABLE 10

EMPLOYMENT SUMMARY FOR OIL FIELD CONTRACT SERVICES
PER AVERAGE WELL

Oil Field Service[a]	People Employed	Length of Employment	Man-Months
Drilling Vessel	80[b]		300
Supply Boat	40		160
Catering	11		44
Weather Forecasting	4		16
Helicopter	10	4 months	40
Mud Engineer	2		8
Well Logging	7		28
Completion (Cement)	2		8
Diving	7		28
Environmental Studies	22	.6 months	13
Total	185		665

(a) Excludes geophysical, operator's staff, and miscellaneous employment.
(b) Assumes 75 average per rig and 5 shore support.

Source: Dames & Moore

Residential Patterns of Employees

It is clear that the bulk of OCS exploration employment went to nonresidents of the state. Virtually no resident employment was reported for drilling, supply boat, and catering contractors. These three services account for 72 percent of the oil field contractor services (see Table 11). If two-thirds of the remaining oil field service employment was accounted for by Alaska residents, then 81 percent of the total oil field contract related employment was nonresident.

We have estimated that oil company employment amounted to 1,500 man-months. These firms all have Anchorage offices, although their size varies with the amount of their Alaskan production and exploration activity. It seems safe to assume that some 90 percent of oil company employment involved Alaska residents.

Let us assume that half of the 1,960 man-months of geophysical employment invoved Alaska residents. Let us further asssume that all of the estimated 2,000 man-months of miscellaneous employment involved Alaska residents (the construction, transportation, and communication industries in Alaska are unionized, and presumably these jobs were held by residents). On the base of the foregoing assumptions, a total of approximately 4,410 man-months of employment were created for Alaskans, or 38 percent of the 11,488 total man-months of employment generated over the 3-year period.

TABLE 11

PETROLEUM EXPLORATION GENERATED EMPLOYMENT

Employment	Total Man-Months	Estimated Percent Resident Participation	Estimated Man-Month of Resident Participant
Petroleum and Related Service	7,528	19	1,430
Geophysical	1,960	50	980
Miscellaneous	2,000	100	2,000
Total	11,488	(38)	4,410

Wages and Unionization

There is virtually no public information available about wages paid for OCS petroleum related employment. Bill Hacklin, business agent for the Alaska Roughnecks and Drillers Association estimated that wages paid to offshore drilling rig workers were generally between $8 and $10/per hour less than pay in comparable work onshore. An offshore worker who was employed on the SEDCO 706 estimated the following wages:

driller	$8.75/hour
derrick hand	$7.50/hour
floor hand	$6.90/hour

Employees work 12 hours per day, 7 days a week, or 84 hours per week. Time and one half is paid for work beyond 8 hours per day, so 44 hours of overtime are accumulated per week. Rotations are 21 days on and 21 days off, or 28 days on and 28 days off. Workers are not paid during the time they are off duty, which is approximately half the year.

Global Marine Drilling Company provided the data in Table 12. However, no interpretation of the figures was provided. It appears that these are typical average monthly incomes calculated on a 12 month basis. That is, actual income in one month would be twice these figures, and incomes the next month would be zero, etc. Estimated hour wage rates above correspond to these figures very closely on an annual basis.

In August 1977 union wages negotiated by the union and Brinkerhoff/ Nabors Joint Venture 36 for these positions were $17.55/hour, $16.15/hour, and $14.00/hour respectively. (16)

It was reported that drilling, supply boat, and other crews that returned to the lower 48 on home leave rotation were given a roundtrip plane ticket and $50 in cash. The cash was apparently not recorded as a wage payment.

Construction, truck transportation, and longshoring employment, all of which occurred onshore, was presumably covered by union contracts. Apparently none of the offshore work was unionized. Cement engineers, mud engineers, and well loggers are professional, salaried, nonunion positions.

(16) Contract By and Between Brinkerhoff/Nabors Joint Venture 36 and Alaska Roughnecks and Drillers Association 1977-1979, January 1977.

TABLE 12

TYPICAL MONTHLY WAGES FOR OPERATING AND DRILLING CREW(1)

Drilling Foreman	$2,300
Driller	$1,950
Derrickman	$1,700
Rotary Helper	$1,575
Roustabout	$1,375
Rig Mechanic	$1,675
Electrician	$1,700
Welder	$1,625
Crane Operator	$2,000
Master	$2,200
Seaman	$1,525
Steward	$1,550
Utility	$1,175
Chief Engineer	$2,200
Ass't. Engineer	$2,000

Source: Global Marine Drilling Company

(1) These figures were provided without interpretation. They are assumed to represent an average monthly income over a 12-month period.

Ix$_m$ COST INFORMATION AND LOCAL EXPENDITURES

Information about the cost of various services and supplies is so scarce, so fragmentary, and so lacking in detail that it does not provide the basis for a detailed income analysis of OCS activities in Alaska. Furthermore, much of what is available is hearsay information provided by contractors about the estimated costs of other oil field services. Contractor fee schedules depend so much on the scope of services provided and the equipment and material supplied that companies are reluctant to quote average prices. Most consider their fees and lease rates to be highly confidential. Also, conditions of supply and demand can significantly influence equipment lease rates.

Daily charter rates of the large semisubmersible drilling vessels are confidential. We could find no published source of information about rig lease rates. A general rule of thumb that used to prevail in the industry was that the rig could expect to command as a daily rate about one percent of its cost of construction. However, the supply of rigs has increased recently and it is rumored that they surpass demand. Therefore, the rule is no longer valid.'[17] While rigs are "stacked" -- that is, standing by without work -- they cost their owners upwards of $10,000 per day. This figure presumably represents outlays for wages, fuel, maintenance, and transportation services and does not include fixed costs such as depreciation and loan amortization which are the main elements of a lease or charter rate.

Daily charter rates of supply boats is reported to be in the neighborhood of $4,500. This fee includes the boat, its maintenance, and crew but does not include cost of fuel, water, and shore-based longshoring, which are provided by the operator.

Geophysical surveys reportedly cost in the neighborhood of $10,000 per day. A significant expense associated with geophysical surveys is that

(17) See, for example, "53 Rigs Idle in Worldwide Drilling Fleet". Ocean Industry, June 1977. The article states: "North Sea day rates have taken the worst beating. A semi-submersible contracted today could have a day rate from $16,000 - $19,000, which is quite difference from the $40,000 - $50,000/day commanded a few years ago".

of navigation, which may be subcontracted to an independent surveying firm. This service averaged $800 or more per day and is included in the daily rate quoted by the geophysical firm.

A breakdown of transportation costs for the Lower Cook Inlet C.O.S.T. well was provided by Atlantic Richfield (Table 13). The C.O.S.T. well involved 112 days on location. These figures indicate helicopter expenses at $1,340/hour and supply boat expense at $4,300/day.

TABLE 13

TRANSPORTATION EXPENSES, LOWER COOK INLET C.O.S.T. WELL

Fixed Wing Aircraft:		
Personnel - Averaged 33 commercial return flights per week		$ 26,000
Air Charter		8,000
Freight - Commercial and Charter		45,000
Helicopter (l): Averaged 2 flights/day @ 1 hour/flight		800,000
Trucking:		40,000
Boats (2)		966,000
Terminal	Avg. Port Calls/Me.	
Homer	12	
Nikiski	6	
Yakutat	1	
TOTAL Transportation COST (LESS FUEL)		$1,885,000

Source: Atlantic Richfield

Total cost of drilling an offshore well in the Gulf of Alaska has been reported to be about $100,000 per day.(18) On the basis of this estimate, a well that involved 120 days of operations would cost in the neighborhood of $12 roil" ion. A paper prepared by U.S. Geological Survey staff in April 1978 states that "the deepest well . ..cost roughly $23 million, and average we" 1 costs were in the vicinity of $15 million".(19)

(18) Sea Flip Todd, "Half Dozen Rigs to be in Deep Waters by Spring," Alaska Industry, March 1977.

(19) Plafker, et.al., "Petroleum Potential, Geologic Hazards, and Technology for Exploration in the Outer Continental Shelf of Alaska Tertiary Province". U.S.G.S. Reston Virginia, 1978.

Expenditures for goods and services in Alaska are probably about a quarter or less of the approximate $100,000 per day per well expenses. In its Notice, Exxon stated: "Local Purchases for services, materials and equipment will be an estimated $750,000 per month. This includes diesel fuel for drilling rig and supply vessels, helicopter service, oil field materials, rental tools and services, and miscellaneous materials and victuals." In its Notice, Shell, however, projected its in-state expenses at $500,000 per month: "The amount of services and equipment to be procured within the state is estimated to be about $500,000/month. This includes fuel and lubricants for the boats, rig, and helicopters, helicopter services, chartered aircraft, and oil field rental tools and service." Texaco also estimated monthly expenditures of approximately $500,000 in Alaska (assuming an average of 4 months per well):

> "Texaco plans to transport casing, tubing, and wellheads to the Gulf of Alaska from the lower 48. The drilling contractor will provide all drill pipe. All other equipment, food, drilling tools, mud, cement, water, fuel, and rental equipment will be obtained in Alaska or from the nearest available source. The major supplies procured within the State will approximate $4 million for the two proposed wells. Most supplies will be obtained from Anchorage with the major portion of fuel, mud, chemicals, and water being obtained in Seward as available." (Notice)

Gulf Energy and Minerals Company stated that the company purchased approximately $3,000,000 worth of materials in Alaska from Alaska service companies for its one wildcat well drilled by the Aleutian Key (20)

(20) Personal communication from H. A. Rud, Drilling Superintendent, Gulf Energy and Minerals Company.

x. MAJOR SUPPLY ROUTES UTILIZED TO SUPPORT OFFSHORE DRILLING ACTIVITY

Figure 2 depicts the major supply routes used to support drilling activity in the Gulf of Alaska. Tubular goods (casing and drill pipe), wellhead equipment, bulk mud and concrete, and similar goods were shipped to Yakutat and Seward by barge and then transshipped to the drilling rig by work boat (an 18-hour trip from Seward; an 8-hour trip from Yakutat). Supplies also arrived at Seward from Anchorage and Nikiski (where mud, concrete, and service vendors maintain yards) via the Alaska Railroad and highway. Freight arrived at Anchorage and Nikiski by ocean-going barges, container ships, and roll-on-roll-off truck and rail ships. Water was obtained at Seward and Yakutat.

Crews were ferried to and from the rigs in the Gulf of Alaska from Yakutaga by helicopter. Supply boats were not used for crew changes. Occasionally a crew change was made directly to Yakutat by helicopter, but the trip was about an hour compared to 10 minutes to Yakutaga. Crews flew by charter fixed-wing aircraft to Anchorage or Yakutat to connect with scheduled jet service for Seattle. Bulk aircraft fuel was airlifted to Yakutaga from Anchorage.

Figure 3 depicts the major supply routes used to support the C.O.S.T. well in Lower Cook Inlet. Personnel, light freight, food stuffs, and fresh water were transported by helicopter and work boat from Homer. Mud, cement, and other heavy materials were transported from the rig Tender's dock at Nikiski. Fuel for the rig and work boats was trucked from the Tesoro refinery to Nikiski where it was loaded on work boats. Helicopter fuel was trucked from the Tesoro refinery to the Homer airport. Tubular goods and wellhead equipment was shipped from the Arco-Shell storage yard at Yakutat (see Table 13).

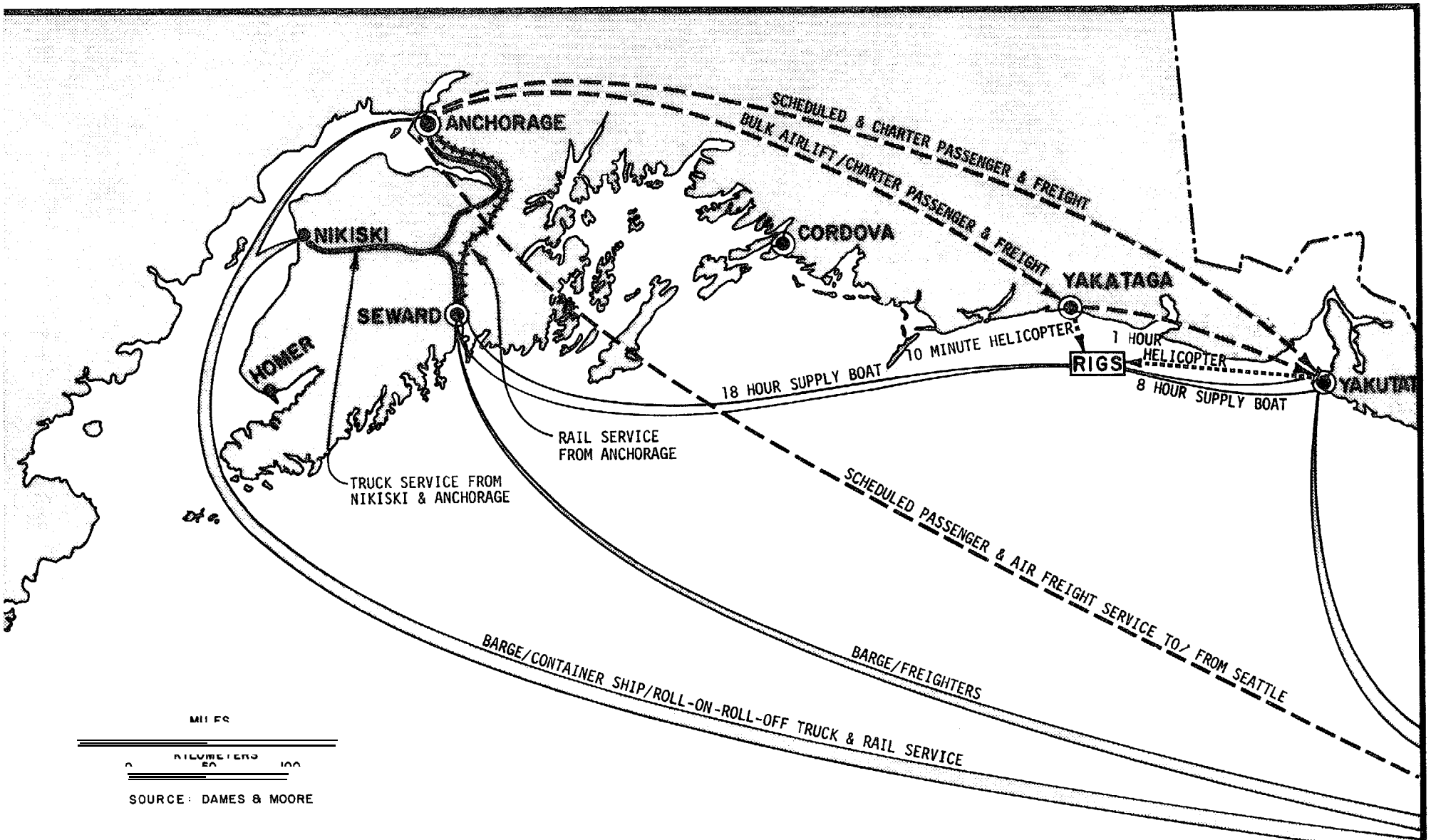

FIGURE 2

SUPPLY ROUTES FOR DRILLING VESSELS IN NORTH EAST GULF OF ALASKA

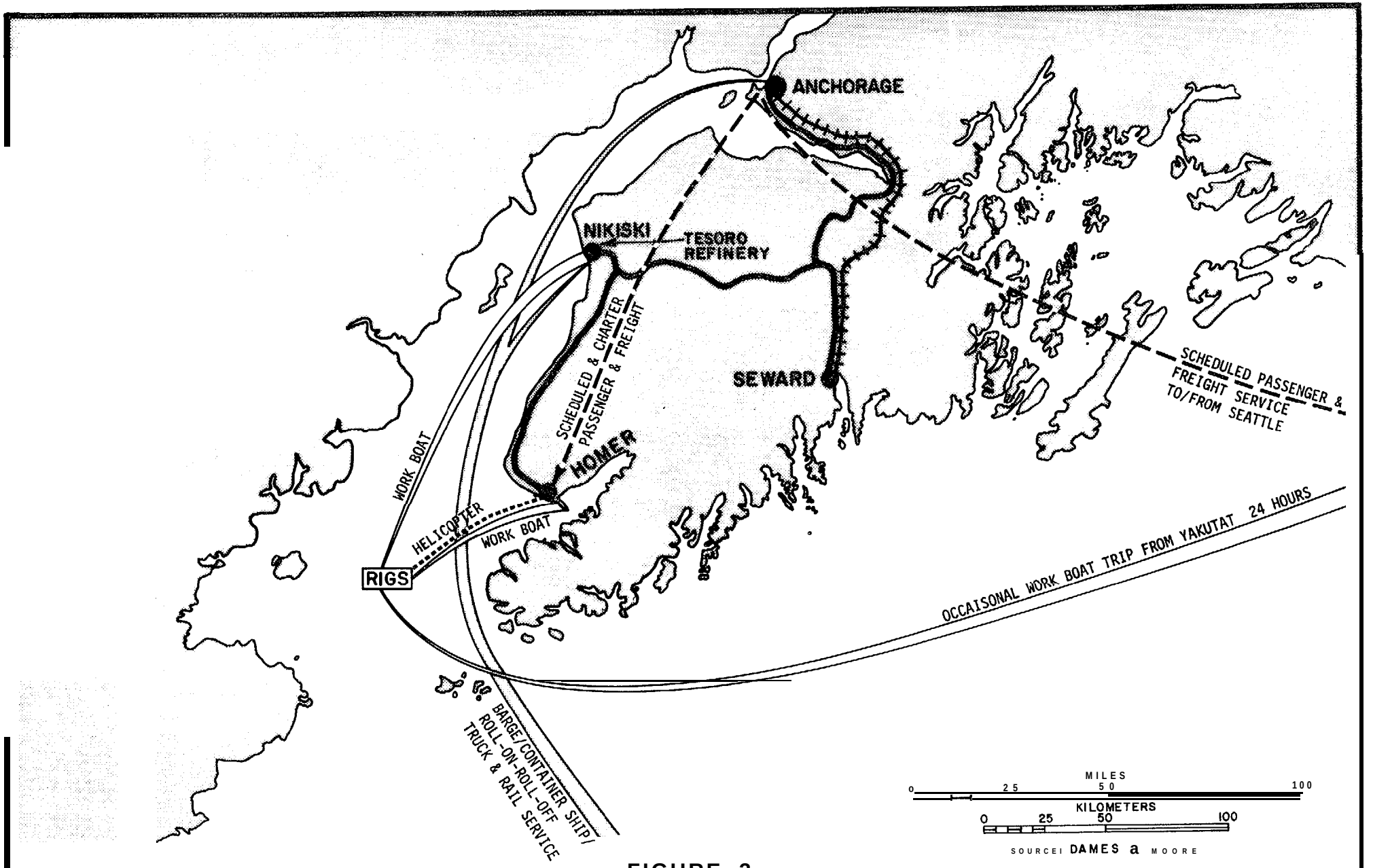

FIGURE 3

SUPPLY ROUTES FOR DRILLING VESSEL IN LOWER COOK INLET

XI. COMMUNITY IMPACTS

OCS petroleum exploration in the Gulf of Alaska and Lower Cook Inlet between April 1975 and June 1978 did not cause "boom" conditions in Anchorage or any of the rural communities touched most directly by the activity -- Yakutat, Seward, and Homer. This is not to say that the communities were unaffected or the bustle at dockside went unnoticed by the townspeople. OCS activity did stimulate the local economies, but it did not create "boom town" effects. Essentially, the local impacts of OCS work were limited to (1) small increases in local wage employment in a few industries such as construction, transportation, and communication; (2) significant but short-term spurts of activity for a few local businesses, mainly grocery stores and hotels; and (3) significant and rapid appreciation of real estate (primarily land) values. There was no general inflation or local shortages of labor, goods, or services. These small community impacts are explained by the absence of major construction activity, the employment of many nonresidents, and the fact that the offshore rigs and supply boards provided worker housing.

In contrast to the development phase of petroleum activity, which involves massive construction employment, OCS exploration normally should not result in significant impacts of a social and economic nature at the community level. Oil companies use available infrastructure during exploration to the greatest extent possible. Wildcat wells are expensive and have a low probability of success, especially in frontier areas, so exploration involves a minimum of investment in permanent shore facilities. It is only after hydrocarbons of commercial value are discovered that massive construction activity begins and the local presence of the industry becomes permanent.

Significant community impacts could occur if no suitable infrastructure was available in a frontier area to support a major exploration program. In this case, considerable construction would be required.

For the most part, oil field contractors working in the Gulf of Alaska used permanent or regular employees from the lower 48 who tend to follow oil field work wherever it takes them. This preference for nonresident crews caused conflicts in Alaska where a petroleum industry exists and

manpower is available locally (in part, local manpower may have been avoided because of the unionization of Alaska oil field workers). Nonetheless, few Alaskans were hired, and as a consequence payrolls were not spent in the state. Even at nonunion pay scales this was a significant amount of money that did not enter the state's income stream.

Because OCS-related work is offshore, there is virtually no need for the housing of workers onshore. In contrast to major onshore exploration programs or construction projects that cause an influx of nonresidents to an area and lead to a series of adverse impacts such as housing shortages and public revenue shortfalls, offshore exploration activity does not cause significant population increase. Virtually all of the nonresident workers lived aboard the rigs or work boats and left their families at home. Thus, the potential for a significant set of community impacts was avoided by the fact that housing was available on the vessels for most workers.

Yakutat

Because some construction was required at Yakutat prior to operation of the Monti Bay facility, and because it was used frequently by all of the operators for crew changes via Yakutaga, the community of Yakutat received the greatest OCS impact. Early construction work on the Ocean Cape cannery dock, the dock across the bay that was eventually used for OCS support purposes, and conversion of the White Alice site for transient quarters reportedly required a work force of about 36 people.[21] Operation of the base required 23 people, of whom 17 were local residents.[22] No one moved to Yakutat merely in hopes of getting OCS-related work.

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(21) Flip Todd, "Half Dozen Rigs to be in Deep Waters by Spring," Alaska Industry, March 1977.

(22) Ibid.

In addition to increased wage income from employment of local people, income to several local businesses was generated, including the local grocery store (Mallotts) and the restaurant/hotel (Glacier Inn). Yak-Tat Kwaan, the native village corporation, was a joint venture partner with the Arco/Shell consortium, and it is not known whether or how this group profited financially from participation.

Real estate prices appreciated significantly in Yakutat from the fall of 1974 when the oil companies first expressed interest in Yakutat as a supply base. The assessed valuation of property more than doubled from 1974 to 1976.([23])

Seward

The city manager of Seward, Johnny Johnson, reported that Seward definitely did not experience an OCS-related "boom."[(24)] He stated that a number of local businesses experienced a measure of unusual prosperity during the height of drilling, and that Seward benefitted generally from the OCS activity. However, apart from real estate transactions spurred by distant visions of Seward as the center of major petroleum development in the Gulf of Alaska, there was no business expansion of a speculative nature, and consequently no "busts" when the pace of activity slowed. Local grocery and general supply stores benefitted from purchases by the catering firms and supply boat owners. A local cold storage, freight handling, and steavadoring firm, Ocean Express, also received OCS-related work.

Demand for longshoremen increased as a result of OCS activity, but the labor situation in the town as a whole was not dramatically altered. Midwinter unemployment was as high as usual.

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(23) "Oil in Yakutat" (interview with Byron Mallet), Alaska Construction and Oil, March 1977.

(24) Personal communication, February 28, 1978.

The only rapid price increases that occurred in Seward were in real estate, including undeveloped land, residential real estate and commercial real estate. This inflationary activity was not caused by increased competition for actual land use stimulated by OCS activity. Rather, it seems to have been the result of speculation about the possible long term future of Seward as a focus of Gulf of Alaska petroleum development. (25) Market prices of land increased quickly and much faster than municipal appraisals, which increased some 30 percent between 1976 and 1977. Dick Erickson, a Seward real estate broker, believes that Seward property had been significantly undervalued in comparison with other Alaska towns because of the local economic depression since the 1964 earthquake,([26]) and that the recent price increases were in large part a process of Seward catching up with the general Alaska economy.

Homer

Wildcatting will not be underway in Lower Cook Inlet until the summer of 1978. To date, one C.O.S.T. well has been drilled, and direct impacts on the community that are attributable to this well have not been significant. A.R.Co. leased warehouse and lodging facilities on the Homer Spit and local operations involved only one full-time A.R.Co. logistics supervisor and one contract expediter. However, Larry Farnan, city manager of Homer, believes that between 20 and 25 families who are employed by or are associated with the industry have recently moved to Homer. (27) This would suggest that preparations are underway for summer drilling operations and that there is speculation by oil field workers that employment opportunities will exist soon.

Real estate values have been increasing phenomenally in Homer since the early 1970s. ([28]) Speculation about future OCS exploration and development have doubtless contributed to recent inflationary pressure. However, local wealth and population have been growing rapidly in recent years from the impetus of tourism, recreation, and the fishing industry which has seen high prices and large harvests in the last 2 years.

(25) See annual reports on Alaska real estate trends in Alaska Industry, November 1976 and November 1977.

(26) Personal Communication, February 28, 1972.

(27) Personal Communication, March 1, 1978.

(28) See Alaska Industry, November 1376, 1977.

XII. COMMUNITY PLANNING EFFORTS TO MITIGATE IMPACT

Yakutat

The town of Yakutat was the most vulnerable to potential social impacts as a consequence of OCS petroleum exploration activity. Community leaders responded to the selection by two major operators of Yakutat as a supply base with a comprehensive mitigating strategy. This strategy, although frequently annoying to industry interests whose initial plans were thwarted, channeled development above the lines deemed most desirable from the community point of view.

Yakutat is not in an organized borough. It is a first class city and exercises most of the governmental powers of a first class city, including those of planning and zoning. The native residents of Yakutat are also organized as a village profit corporation under terms of the Alaska Native Claims Settlement Act of 1971. As a consequence, the population of Yakutat (which is predominantly Tlingit Indian) possesses simultaneously the public powers of government and the private powers of business corporations. This combination enabled the town to take unique and decisive action to mitigate the potential impacts of OCS development. Acting together, the municipality and the village corporation (the Kwaan), with cooperation by the state, managed to concentrate OCS support base activity on a 77-acre site on the south side of Monti Bay away from the main part of town; obtained commitments from the oil companies for maximum feasible local hire for operation of the supply base (see page 46); acquired ownership rights to the improvements made for OCS support activity; and limited population growth in Yakutat to a small, temporary phenomenon.

Yakutat's efforts to mitigate OCS impacts took place over a two year period which began in the fall of 1974 when a consortium of three oil companies, Atlantic Richfield, Shell and Mobil (Mobil eventually withdrew from partnership) purchased the Ocean Cape dock and cannery site. This

site was deemed undesirable for support base activity by the local residents because of its central location in town. The municipality of Yakutat, the Kwaan, and the State of Alaska cooperated to relocate the base. For its part, the municipality threatened to rezone the Ocean Cape site to prevent industrial development. The Kwaan developed an alterantive site proposal. It arranged to acquire a desirable site away from town through a land trade with the state. After the site was acquired from the state, the city annexed it in order to reach activity there with its regulatory powers. The Kwaan then entered into a contractual agreement with the oil companies. Although the specific terms of the contract are not public, they are known to provide for the eventual acquisition by the Kwaan of the improvements to the property made by the oil companies. Also, the Kwaan and oil companies were to derive income from the property through lease agreements of excess capacity with nonpartner oil companies. The Kwaan and municipality also insisted on maximum feasible local hire by oil companies and their contractors. A maximum of 17 local residents were employed in construction and support base operations for which no training program was required. Two local residents received appropriate training to work as roustabouts on an offshore rig operated by Atlantic Richfield.

Seward and Homer

Both Seward and Homer are located within the Kenai Peninsula Borough, which reserves to itself all planning and zoning powers. Therefore, responsibility for the mitigation of impacts from OCS activity in these towns rests with the borough planning office in Soldotna. The main mitigation efforts made by the planning office were a series of studies undertaken on contract to the Alaska Department of Community and Regional Affairs. These studies were funded primarily by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Their objective was to contribute to the development of a Kenai Borough Coastal Management Program that meets the requirements of the recently adopted state coastal zone management act. OCS activities provided a focus for the coastal zone management program development effort.

A major accomplishment of research during 1976 and 1977 was publication of a series of baseline studies for Kenai, Soldotna, Homer, Seldovia, and Seward. These volumes, titled "OCS Development: A Blessing or a Headache?" discuss land use, the economy, public finances, and community facilities and services in each town. Other objectives of the CZM project include technical planning assistance to borough communities.

Another study which is designed to develop an economic adjustment strategy in response to OCS development opportunities is funded under Title IX of the Public Works and Economic Development Act of 1965.[29]

Partially in response to impending OCS activity and partially in response to growth occurring from or anticipated from other causes (e.g., the 200-mile extended fishery jurisdiction), the Kenai Borough established advisory planning commissions in Homer and Seward to increase local participation in the planning process and achieve better cooperation between local and borough government on planning matters.

While the prospect of oil development in the Gulf of Alaska precipitated a rise in real property values in Seward, support activities for Gulf of Alaska exploration there did not elicit counteractive measures. The city was not required to fashion a mitigative strategy by expanding public resources, rezoning land, or taking other actions. The municipality is in the process of expanding water service and sewage treatment. However, city officials point out that this expansion is motivated by long-term growth expectations as well as more stringent treatment regulations of the Environmental Protection Agency. Seward is eligible for and has applied for Coast Energy Impact Funding from the federal government. A grant of $300,000 is expected to be approved that will be used for planning and engineering studies for the small boat harbor and electrical distribution system, both of which are in long-standing need of expansion.

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(29) See Final Report: Kenai Peninsula Borough OCS/Coastal Zone Management Grant Program Project, Kenai Peninsula Borough Planning Department, December 1977.

Homer officials are preparing for anticipated OCS impacts by augmenting the municipal zoning ordinance to include provisions for townhouse apartment construction and to expand the area available for light commercial activity. At the present time Homer does not have comprehensive regulations for townhouse construction, which are dealt with by special land use permits. Also, there is a need for additional land zoned for light commercial uses that is located off of the spit. City officials would like to make land available for such uses as truck, trailer, and equipment storage near the state-owned airport.

XIII. DEVELOPMENT PROPOSALS

There were two private proposals for major supply base development which have not been implemented. Initial steps were taken to implement one of the proposals; the other appears to have gone no further than the concept stage. However, both of these schemes, and a number of less ambitious proposals, are now dormant and will doubtless remain so until commercial petroleum discoveries are made.

Dresser Industries proposed to construct a 400-foot by 70-foot dock and 40-acre supply yard between the Seward Fisheries dock and the Alaska Railroad dock at Seward. The new dock would be filled sheet pile bulkhead construction. A barite grinding mill would be constructed to crush ore shipped from Peru. As many as six 200-foot-class supply boats could be loaded at once from the facility. Initial plans called for construction to begin at midyear in 1977. Dresser obtained an 80-year lease on the property from the City of Seward and apparently negotiated leases for additional land from the Alaska Railroad. A dredging permit from the Corps of Engineers was applied for. Because activity in the Gulf of Alaska has slowed and the prospects are no longer bright, the project is in abeyance. According to the terms of its lease agreement with the city, Dresser has eight years to complete construction.

Another proposal for construction of a supply base was advanced by the Chugach Native regional corporation. The site for construction was Icy Bay, in close proximity to the most promising offshore leases on the Icy Bay anticline. It was reported that a subsidiary of the regional corporation, Chugach Development Corporation, entered into a joint venture with Anchorage Helicopter Service to develop the venture.(30) The isolated Icy Bay site has potential as the location of production facilities, but it does not appear to be a convenient site for a supply base because it has no existing dock, airfield, or surface transportation links with Anchorage.

Holders of a lease on the old Alaska Freight Lines dock at Seward have attempted to promote expansion and improvement of the dock for use by supply boats. The development was also to provide dry docking and vessel repair service. Plans are presumably dormant at the present time.

At Yakutat, the Kwaan (village corporation) has planned to develop an office and hotel complex at the Ocean Cape cannery site which was repurchased from the ARCO/Shell group. Pacific Alaska L.N.G. examined sites near Yakutat for a possible L.N.G. plant. Also at Yakutat, A.R.A. Services was considering construction of cold storage and supply warehouse

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(30) This proposal, as well as the Dresser proposal, are discussed in Flip Todd, "Offshore activity spawning its own support industries," Alaska Industry, August 1976.

XIV. ACCIDENT DATA

No oil spills, blowouts, or similar accidents were reported. Only one serious (non-fatal) personal injury was reported: a roustabout was hit in the face with a crane hook while stacking drill pipe aboard the ODECO Ocean Ranger.

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