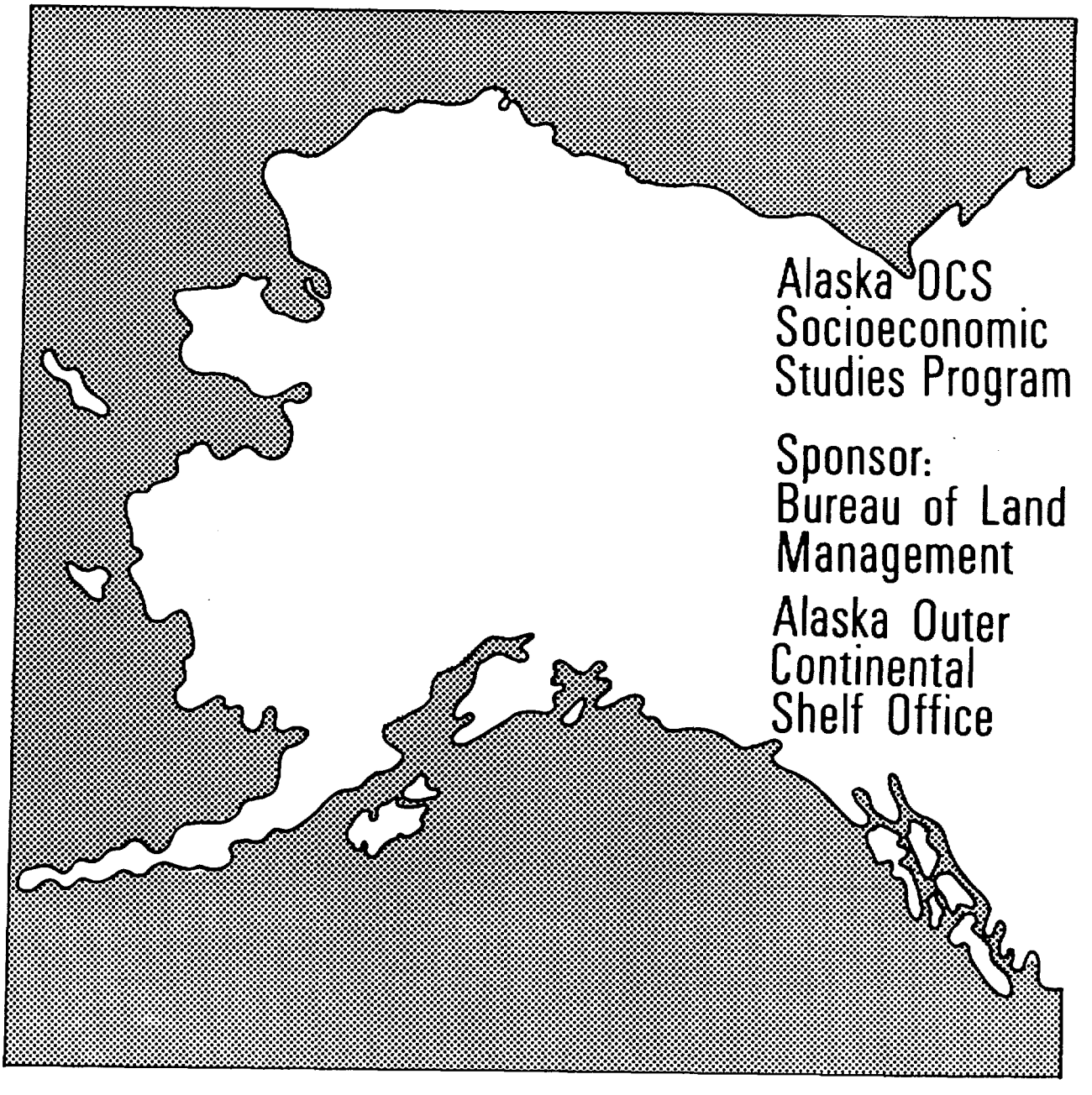
Technical Report
Number 55



Monitoring Oil Exploration Activities in the Lower Cook Inlet

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 offshore 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 offshore 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 (SESP).

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 overall methodology is divided into three broad research components. The first component identifies an alternative set of assumptions regarding the location, the nature, and the timing of future petroleum events and related activities. In this component, the program takes into account the particular needs of the petroleum industry and projects the human, technological, economic, and environmental offshore and onshore development requirements of the regional petroleum industry.

The second component focuses on data gathering that identifies those quantifiable and qualifiable facts by which OCS-induced changes can be assessed. The critical community and regional components are identified and evaluated. Current endogenous and exogenous sources of change and functional organization among different sectors of community and regional life are analyzed. Susceptible community relationships, values, activities, and processes also are included.

The third research component focuses on an evaluation of the changes that could occur due to the potential oil and gas development. Impact evaluation concentrates on an analysis of the impacts at the statewide, regional, and local level.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decisionmaking. Reports are available through the National Technical Information Service, and the BLM has a limited number of copies available through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

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Alaska OCS Socioeconomic Studies Program

MONITORING OIL EXPLORATION ACTIVITIES IN THE LOWER COOK INLET

Prepared For

Bureau of Land Management

Alaska Outer Continental Shelf Office

Prepared By

Northern Resource Management

July 1980

NOTICE

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Alaska OCS Socioeconomic Studies Program
Monitoring Oil Exploration Activities In The Lower Cook Inlet

Prepared by
Northern Resource Management

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Chapter I

INTRC)IIUCTION

INTRODUCTION

Purpose. This study is one part of the Alaska OCS Socioeconomic Studies Program, a multi-year research effort which attempts to predict and evaluate the effects of OCS petroleum development on the physical, social and economic processes in Alaska.

The objective of this particular study is to obtain an accurate historical accounting of the events and effects of OCS activity related to the Lower Cook Inlet Lease Sale CI between the period of October 1977 and January 1980. The information from this study will be used to evaluate and improve the prediction process for the social and economic effects of future lease sales in Alaska. In addition, this study will provide basic data needed to prepare petroleum development scenarios. The information will also be utilized to satisfy a number of NEPA requirements in the EIS process and will specifically contribute data to verify and upgrade EIS exploration scenarios, monitor the effects of various lease sale stipulations and help develop improved stipulations in the future, as well as provide a basis for a number of management decisions required throughout the sale process.

Location. The Lower Cook Inlet Sale CI is located in the southern third of Cook Inlet in Southcentral Alaska. The sale area encompasses approximately 1,800 square miles between the state-owned waters of Kachemak Bay and the Kenai Peninsula on the east, the Barren Islands and Shelikof Straits on the south, the Alaska Peninsula on the west and Upper Cook Inlet to the north. Anchorage, a major administrative center, is approximately 180 airline miles to the north. Kenai (including North Kenai and the industrial area of Nikiski), the primary supply

base for oil field operations in Cook Inlet waters is one hundred airline miles north of the sale area (population 4,421). Homer, utilized as a secondary supply and crew transport base, is forty-five airline miles to the east (population 2,800). Seward, utilized sporadically as a supply base, is located 120 airline miles to the northeast. Smaller population centers located on the lower arm of the Kenai Peninsula near the sale area include the city of Seldovia and the villages of English Bay and Port Graham. There are no population centers on the west side of the sale area on the Alaska Peninsula. Figure 1 shows the general lease sale outline, as well as the above described surrounding areas.

Organization. The report is organized into four chapters. Chapter I includes the overall introduction to the report. Chapter II describes the basic technical, materials, personnel, cost and wage data concerned with operations related to the Lower Cook Inlet sale. Chapter 111 concentrates on the major effects and impacts of the exploration activity on local communities. Such things as public service demands, prices, business cycles, labor effects, community attitudes, and others are discussed in relation to the sale. Chapter IV summarizes major conclusions for the entire report. Although each part could be read separately, portions of Chapter III build on data analyzed in Chapter II. Chapter IV will give a quick overview of the major findings of this report.

Acknowledgments. Due to the nature of the information required in this report, a significant portion of the total effort involved personal interviews with individuals involved directly in Lower Cook Inlet exploratory operations and knowledgeable individuals in communities affected by these operations, The study team spent considerable time

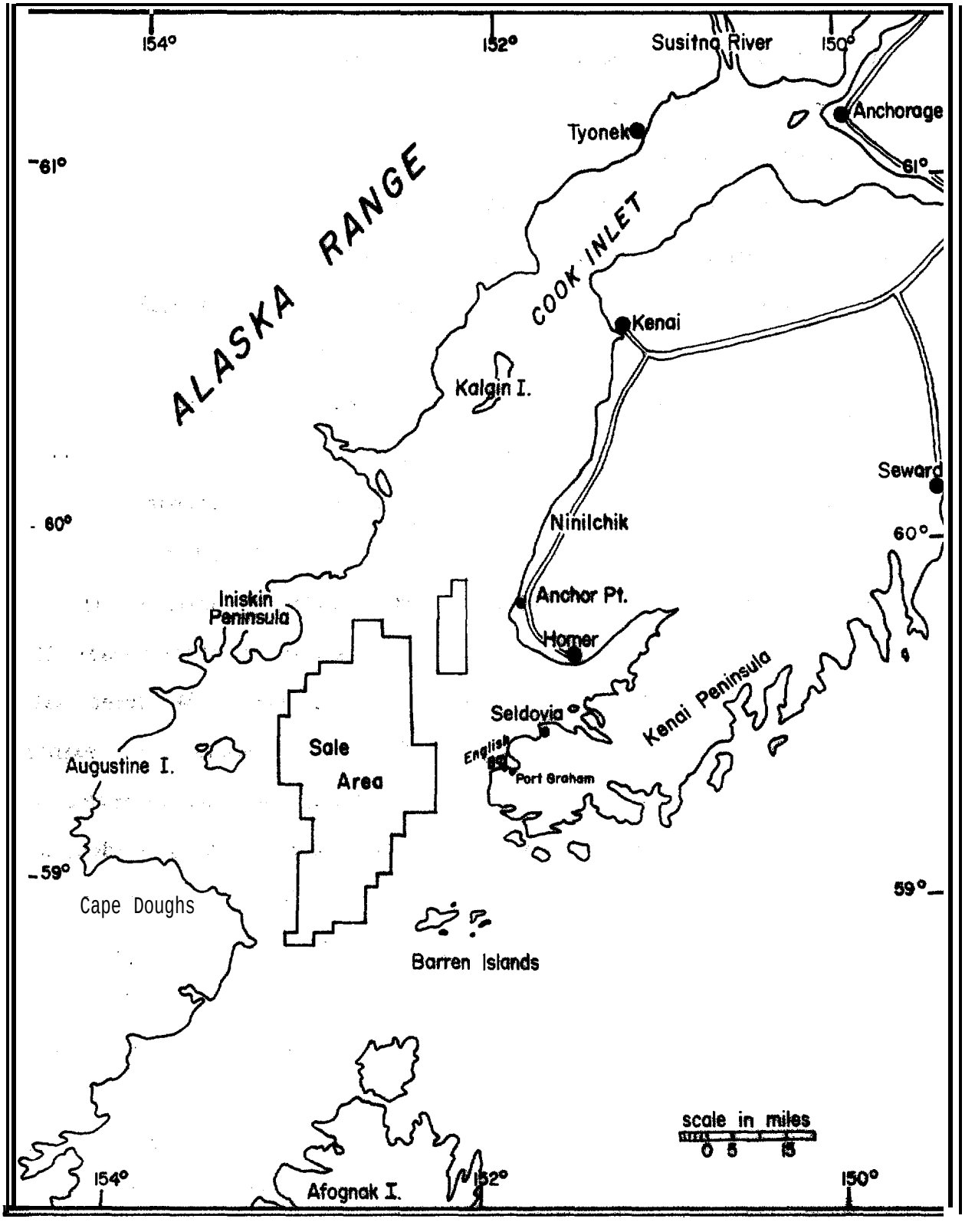


Figure 1. Location of Lower Cook Inlet Sale C. I.

interviewing oil company executives, engineers, contractors, drilling vessel owners, union officials, city managers, city council members, city planners, businessmen, conservationists, newspaper editors, dock managers, helicopter pilots, police officers, government officials and others.

All the individuals interviewed gave us their full and complete cooperation, as well as a significant amount of time out of their busy schedules. We would like to thank each one for their patience and cooperation in answering questions and providing us with insights regarding the operation of the oil industry and the activities, responses and attitudes of the local communities.

Chapter II

PETROLEUM ACTIVITY

INTRODUCTION TO PETROLEUM ACTIVITY

This chapter contains a detailed account of certain aspects of exploration activity concerned with the Lower Cook Inlet Lease Sale CI from October 1977 to January 1980. The purpose is to present available data on the events, costs, materials, vessels, aircraft, shore facilities, and direct industry employment associated with the Lower Cook Inlet lease sale. Most of this chapter consists of descriptive data. The data are analyzed only when analysis helps clarify a particular point or when it can help fill gaps in the documented information. These cases are described in the text.

The organization of the chapter attempts to follow the chronological order of events of the sale. The section on the pre-drilling phase deals with actions which had to be completed before drilling could begin. It contains a brief description of features of the lease sale, followed by sections on survey and permitting activities. The next section describes various components of the drilling phase - the wells drilled, drilling vessels, supply vessels, aircraft, and shore bases, The remaining four sections draw together information relevant to both the pre-drilling and drilling phases of exploration, They describe major supply routes for materials, vessels and personnel within Alaska, accident records and environmental matters, costs and lease rates, and a summary of direct employment data.

Much of the detailed information which has been gathered can best be presented in tabular form. This approach has been adopted throughout Chapter 11 when suitable. However, the tables do not portray all the information and should be read with the accompanying text,

Also, in many cases, the tables contain summaries or estimates which are more fully explained in the text. The use of footnotes to amplify statements in the tables has been minimized and care should be taken to read the explanation in the text before drawing any conclusions.

DATA COLLECTION

In preparing this report, secondary sources of data were used wherever possible. These included specialist petroleum exploration publications, Alaska industry magazines, federal government permit applications, government files and local newspapers, The most productive source was the petroleum information publication called "Scouting Report." It is published weekly and contains an account of drilling activity throughout the state. Periodically, more detailed relevant articles are printed. Other useful publications were Offshore Magazine, The Oil and Gas Journal, Alaska Construction and Oil, and Off shore Rig Data. Applications for federal permits contained valuable information, particularly the "Notice of Support Activity" submitted by the operators to the U.S. Geological Survey (see Appendix A for an example), The Homer News and the Kenai Peninsula Clarion also contained some useful data.

Together, these sources provided an initial base of information. However, details about the exploration activity remained unclear, and parts of the secondary information required verification. All of the primary data was gathered directly from people involved in the exploration effort. Initially, contact was made with the Alaska Oil and Gas Association and the three operators (oil companies) who have drilled, or are drilling, on the Lower Cook Inlet tracts. The oil companies provided information concerning their own operations and were able to verify a significant portion of the data already collected. Next, all the subcontractors and other companies and agencies associated with the Lower Cook Inlet sale were contacted to verify and obtain data.

PRE-DRILLING PHASE

Lease Sale. The Lower Cook Inlet Lease Sale CI was held in Anchorage on October 27, 1977, In all, 135 tracts were offered, with bids on ninety-one, with four rejections. Approximately $400 million was raised in cash bonus bids. The sale attracted considerable interest as one of the initial tests of a variation of bidding methods. Two-thirds of the blocks were offered under the traditional cash bonus method, while the remaining one- third were fixed cash bonus with royalty as the bid variable.

Tables 1 and 2 show the ten highest cash bonus and royalty bids, respectively. All seven wells drilled by January 1, 1980 were in these blocks . Six wells were cash bonus tracts and one well was in a royalty bid tract. Phillips bid the most money at the sale, acquiring five of the ten most expensive cash bonus blocks. Arco bid in partnership and alone to win the largest number of blocks. Marathon, in conjunction with Amerada Hess Corporation and Williams Exploration Company, bought Block 318 for the highest cash bonus paid at the sale. Block 318 was the first tract to be drilled.

Eight stipulations, attached to the leases and specific to this particular lease sale, were partially designed to minimize any deleterious impact that might occur as a result of exploration activities. To comply with the stipulations, operators were required to submit a report of a biological survey, conduct a shallow hazards seismic program, define a proposed environmental training program for all personnel and provide a "Notice of Support Activity" for the exploration program. This "Notice" included a description of facilities to be used in connection

Table 1

TEN HIGHEST CASH BONUS BIDS
LOWER COOK INLET SALE C.I.

Block	Owners*		Bid	Drilled by Jan. 31, 1980
318	Marathon Amerada Hess. Corp. Williams Exploration	50% 43% 7%	$77,000,984.00	Yes OCS Y-0086
274	Phillips	100%	48,402,432.00	No
970	Phillips	100%	46,501,632.00	OCS Y-0152
799	Phillips	100%	33,302,016.00	No
798	Phillips Amerada Hess. Louisiana Land Hamilton Bros. Expl.	50% 23% 22% 5%	30,256,128.00	OCS Y-0156
971	Phillips	100%	27,101,952.00	No
668	Phillips	100%	23,701,248.00	OCS Y-0124
572	Arco Chevron Halbouty Alaska Oil	47% 46% 7%	15,380,006.40	OCS Y-0161
529	Union Oil Texaco Allied Chemical Corp. and others	50% 38% 12%	13,310,208.00	No
576	Arco Chevron Halbouty	47% 46% 7%	8,240,071.68	No

*Percentages are rounded to the nearest whole number.

Table 2

TEN HIGHEST ROYALTY BIDS
LOWER COOK INLET SALE C.I.

Block	Owners		Fixed Cash Bonus Per Hectare	Royalty	Whether Drilled To Jan. 31, 1980
972	Texas E Exploration Co.	100%	$ 62	63.4444%	No
402	Texas E Exploration Co.	100%	62	57.51575%	No
358	Texas E Exploration Co.	100%	62	57.25125%	No
841	Texas E Exploration Co.	100%	124	56.56789%	No
1	Marathon	35%	1,483	55. 15%	No
	Louisiana Lands Expl.	27%			
	Amerada Hess	25%			
	Williams Expl.	13%			
1014	Marathon	35%	62	53.15%	No
	Amerada Hess	25%			
	Louisiana Land Expl.	20%			
	Hamilton Bros.	10%			
	Williams Expl.	10%			
2	Marathon	35%	433	52.15%	Ocs Y-0168 #1 & 2
	Amerada Hess	25%			
	Louisiana Land Expl.	20%			
	Hamilton Bros.	1 0%			
	Williams Expl.	10%			
884	Texas E Exploration Co.	100%	62	50.25125%	No
928	Texas E Exploration Co.	100%	124	49.45125%	No
101	Arco	47%	433	48.157%	No
	Chevron	46%			
	Halbouty Alaska	7%			

with exploration activities which included personnel requirements and residency information, estimated supplies needed and frequency of vessel and helicopter trips, Copies of the "Notice" were sent to state and local governments, the purpose of which was to provide a clear statement of the expected social and economic impact of the exploration phase. Examples of the stipulations for the sale, as well as the requirements for a "Permit to Drill" from the U.S. Geological Survey, are included in Appendix A.

Surveys. Table 3 summarizes the pertinent data concerning surveys. Two major types of surveys were undertaken before exploratory drlling commenced in the Lower Cook Inlet. Under Stipulation 2, the U.S. Geological Survey required a biological survey to be completed to determine if any special biological communities were present at the drilling sites or in the blocks to be explored. The U.S. Geological Survey also issued instructions to provide high resolution seismic surveys to locate shallow faults and slumps to determine the general stability of the seabed and to help locate any shallow high-pressured gas zones.

In January 1978, Marathon contracted with Tetra-Tech, Inc. for a shallow drilling hazards survey of Blocks 274, 275, 318 and 319, and for a preliminary biological survey. The field work was completed in February 1978 and the report was submitted three months later. A total of twenty-one people were involved in the fieldwork, including a boat crew of eight, six biologists and seven seismic technicians. Most resided outside Alaska. In addition, two scientists in the company's Anchorage office worked on the report for three months, with occasional visits from personnel outside the state for presentations. Tetra-Tech

TABLE 3

PRE-DRILLING SURVEYS

Operator:	Marathon	Marathon, Exxon, ARCO, Phillips	Marathon, Exxon, ARCO, Phillips
Type:	Shallow hazards, preliminary biological	Biological	Shallow hazards
Date of fieldwork:	January 19 - February 21, 1978	March 29 - April 19, 1978 April 18, 19, 22, 23, 1978 Marathon; April 21, May 8 - i2, 1978 ARCO	April 22 - June 16, 1978
Date of report:	May, 1978	May, 1978 - Phillips, Marathon July, 1978, ARCO	September, 1978, ARCO
Area:	Less than 300 square miles	125 square miles	Vicinity of each drilling vessel
Contractor:	Tetra-Tech	Dames & Moore	Dames & Moore
Boat :	Sitkin	Night Watch and Sea Wife	Big Valley
Type:	Oil screw 293 gross tons	Night Watch - converted stern trawler; Sea Wife - converted crab boat	Converted Gulf of Mexico trawler
Dimensions:	152 feet by 23 feet	65 feet and 80 feet, respectively	80 feet
Average daily lease rate:	N/A	$1500 - $2000 + fuel	$1500 - $2000 + fuel
Port used:	Homer and Seldovia	Homer	Homer
Boat crew:	8	4	5
Technical crew:	Shallow hazards - 7 Biological - 6	3	5
Total:	12 or 13	7	10
Residence:	Mostly outside Alaska	5 - Homer 2 - Outside	5 - Homer 5 - Outside

used the Sitkin, a Seattle-based boat with a non-Alaskan crew. The Sitkin has been active in the Lower Cook Inlet prior to the lease sale. The surveys were conducted from Homer, but for a short time the Homer pier was damaged and Seldovia was used as the shore base.

In April and May of 1978, Dames and Moore completed a biological survey of five representative blocks of the entire lease sale area. The Homer office of Dames and Moore leased three local vessels, the Big Valley, Nightwatch and Seawife, for the project. They recruited biological technicians from outside Alaska, but otherwise the operation used local personnel from Homer. A total of 125 square miles was surveyed, and the cost was shared by a number of companies.

Shallow hazards surveys were conducted by Dames and Moore from April to June 1978. The Big Valley, a local converted trawler, was retained throughout the period and exact dates of the field work varied throughout the time, based on weather conditions. The technical crew of about five people came from Houston. Otherwise, local personnel and boats were utilized from Homer.

In addition to those discussed above, other types of surveys were conducted. Locational surveys were required to position the drilling vessels at each well site. These required two people, usually for less than a day. Seismic surveys also continued to be conducted in the Shelikof Straits area, but these were unrelated to the sale studied in this report,

Permits. Table 4 summarizes the permit activity which preceded drilling in the Lower Cook Inlet. Three principal permits were required: an "Authorization to Discharge" from the Environmental Protection Agency (EPA), a permit to "Anchor a Drilling Vessel" from

TABLE 4

DETAILS OF MAJOR PERMITS

CORPS OF ENGINEERS: GENERAL PERMIT FOR ANCHORING DRILLING VESSELS

Applicant	Vessel	Date of Application	Date Granted	Effective	Reference
ARCo	Borgston Dolphin (later Dan Prince)	11/17/77	12/13/77	2/1/78 - 2/1/79	071-OYD-7-770278
Marathon	Diamond M Dragon	12/9/77	12/11/77	4/1/78 - 9/15/79	071-OYD-7-770311
Phillips	Ocean Bounty	5/1/78	5/15/78	11/1/78 - 4/1/80	071-OYD-7-780129

ENVIRONMENTAL PROTECTION AGENCY: AUTHORIZATION TO DISCHARGE

Applicant	Vessel	Date of Application	Date Granted	Effective	Reference
ARCO	Borgston Dolphin (later Dan Prince)	11/2/77	6/21/79	7/23/79 - 7/2'3/84	AK 002805-3
ODECO	Ocean Ranger	11/21/77	8/11/78	9/11/78 -6/30/81	AK 002818-5
Japan Drilling co.	White Dragon III	12/1/77	8/11/78	9/11/78 - 6/30/81.	AK 002824-0
Global Marine	Grand Isle	12/14/77	8/11/78	9/11-/78 - 6/30/81	AK 002816-9
Japan Drilling co.	White Dragon II	12/22/77'	8/11/78	9/Is/78 - 6/30/81	AK 002823-1

TABLE 4 (Continued)

DETAILS OF MAJOR PERMITS

ENVIRONMENTAL PROTECTION AGENCY: AUTHORIZATION TO DISCHARGE

Applicant	Vessel	Date of Application	Date Granted	Effective	Reference
ODECO	Ocean Bounty	12/28/77	8/11/78	9/Ii/78 - 6/30/81	AK 002817-7
Marathon	Diamond M Dragon	1/3/78	6/1/78	7/3/78 - 6/30/81	AK 002822-3
Global Marine	Grand (conception	1/5/78	8/11/78	9/11/78 -6/30/81	AK 002821-5
Global Marine	Grand Tasman	1/9/78	8/11/78	9/11/78 - 6/30/81	AK 002825-8
Global Marine	Grand Atlantic	1/13/78	8/n/78	9/11/78 - 6/30/81	AK 002826-6
Exxon	Alaskan Star	1/18/78	8/11/78	9/11/78 - 6/30/81	AK 002827-4
Japan Drilling co.	White Dragon IV	7/18/78	8/22/78	9/24/79 - 6/30/81	AK 002755-3

TABLE 4 (Continued)

DETAILS OF MAJOR PERMITS

U.S. GEOLOGICAL SURVEY: PERMIT TO DRILL

Applicant	Well	Date of Application	Date Granted	Date Abandoned
ARCo	Ocs Y-0097	11/21/77	----	
Marathon	Ocs Y-0086 #l	2/21/78	7/7/78	12/22/78
Phillips	OCS Y-0124 #1, la	6/15/78	9/29/78	5/17/79
Marathon	OCS Y-0168 #1	6/26/78	11/3/78	4/27/79
Marathon	OCS Y-0167	8/30/78	----	
Phillips	OCS Y-0136	2/28/79	4/4/79	9/21/79
Marathon	Ocs Y-0168 #2	4/20/79	4/20/79	8/16 /79
ARCo	OCS Y-0161	6/8/79	7/5/79	1/20 /80
Phillips	ocs Y-0152	6/2/79	7/24/79	4/26/80

Source: EPA; Corps of Engineers; USGS

the Corp of Engineers, and a final "Permit to Drill" from the U.S. Geological Survey (USGS). In addition, there were other permits required from the Coast Guard, the Federal Aviation Administration (FAA) and the Federal Communications Commission (FCC).

EPA regulates discharges into federal waters and, before a drilling vessel can operate on the Outer Continental Shelf (OCS), it must receive approval for all likely discharges. A detailed application is made using a materials balance approach to show the source of all discharges. As is shown in Table 4, twelve authorizations were issued, although only three drilling vessels had operated in the Lower Cook Inlet as of January 1, 1980. Owners of drilling vessels may have chosen to submit "speculative" applications which, when approved, would give their vessel a competitive advantage over other rigs which have yet to obtain authorization. Although three-fourths of the permits have not been used, the first authorization required the most work and subsequent permits were less time consuming, Field work in connection with the permits is undertaken by EPA's Anchorage office, with legal and administrative back-up being provided by their Seattle office. The period of the most intense work was the first eight months of 1978, when one individual was occupied about half time. In addition, occasional inspections are made on the drilling rigs themselves; however, no extra staff were hired for the Lower Cook Inlet sale.

The Corps of Engineers issued General Permits for Anchoring Drilling Vessels. A permit was required for each well drilled. Generally, applications were dealt with very speedily and no inspection or other requirements were necessary, with the exception of the exact

location of the vessel. The lease sale caused little additional work at the Anchorage Corps of Engineers office.

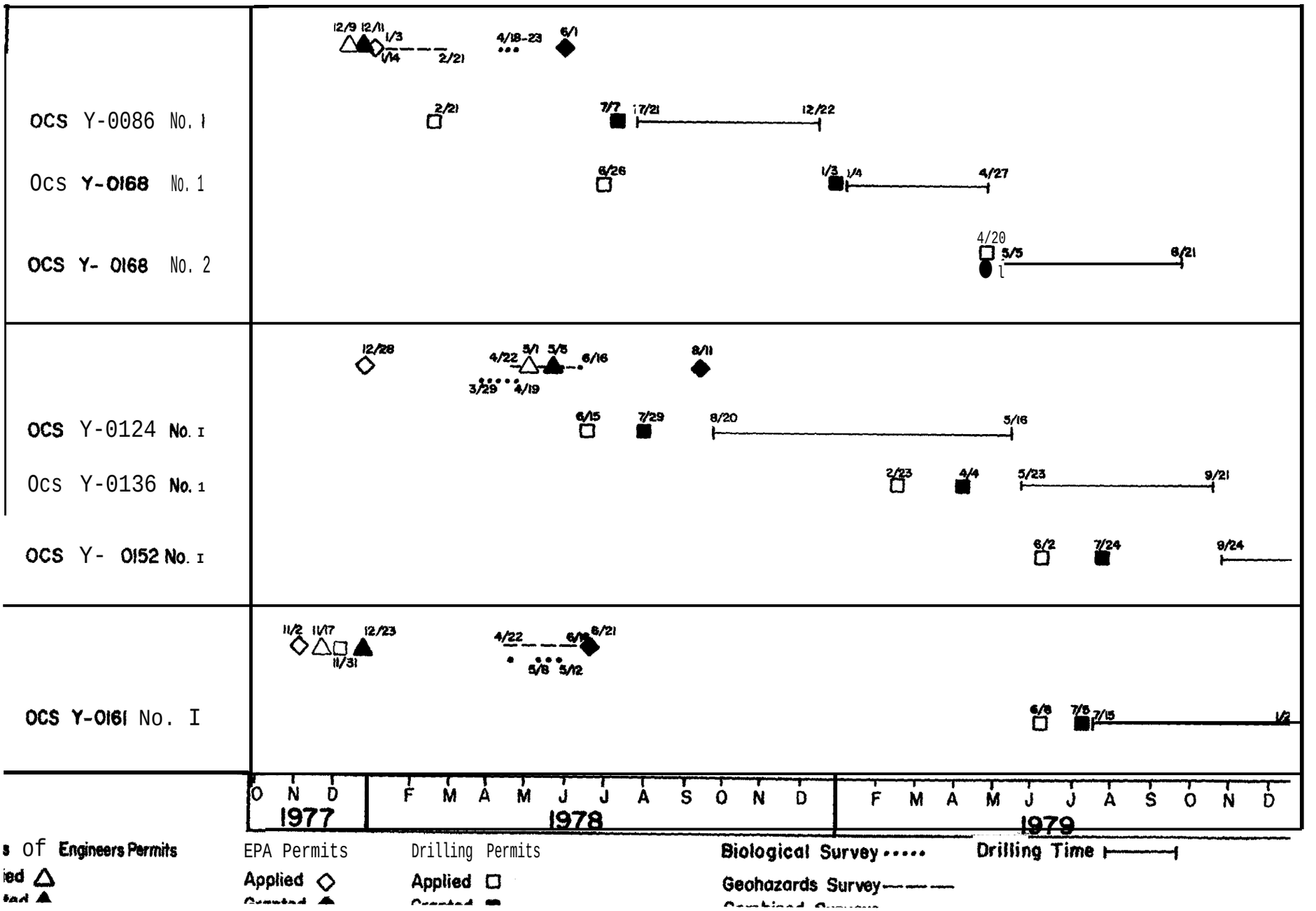
An application to the USGS for a "Permit to Drill" must be accompanied by documents which fulfill the conditions set forth in the lease stipulations. (Relevant stipulations have been discussed earlier.) The application must also specify the exact location of the proposed well. The USGS has taken up to four months to approve an application. However, immediate approval was given for the Marathon well OCSY-0168 number 2, since it was already covered by an existing approved Exploration Plan. The USGS monitor exploration activity closely, with a full time inspector on each drilling vessel and inspectors in Anchorage.

Before helicopters are allowed to fly to drilling vessels, approval must be obtained from the FAA. Approval of a visual flight system (VFR) may be given without delay by the principal operation inspector assigned to the helicopter company. However, before instrument flight control (IFR) may be used, a radio frequency must be assigned to the drilling vessel by the FCC. The FCC ensures that there is no interference between radio and navigational aids in an area. The FAA then allocates the drilling vessel an identification call and flight checks the instruments. All helicopters used for the sale were IFR equipped.

The Coast Guard requires each drilling vessel to obtain a permit for "Class I Private Aids to Navigation on Artificial Islands and Fixed Structures. " The permit verifies that the vessel has installed proper navigational equipment.

Timing of Surveys and Permits. Figure 2 shows the timetable of surveys, permits and drilling activity in the Lower Cook Inlet. A view

Figure 2. Survey, Permit and Drilling Timing



expressed by the operators during the course of this study was that compliance with the regulations and stipulations governing exploration in the Lower Cook Inlet created considerable work and delays in exploration. Marathon indicated they spudded their first well, OCSY-0086, at the earliest possible date after the sale. But even so, they indicated that the nine-month delay was primarily due to the permitting process. Also, in order to proceed with permitting as soon as possible, surveys were conducted during the winter, which Marathon believed increased the cost considerably, as well as hindered the results of the biological survey. Thus , their problem related more to the actual "timing" of gathering permit data rather than the time taken for approval. On the other hand, Arco made an early start on permitting activities, but chose not to begin drilling until July 1979. Another problem encountered by the operators was that they had to commit to a drilling vessel and spend considerable amounts of money bringing it to Alaska without knowing if EPA would permit the vessel,

The timetable shows the buildup of activity in the Lower Cook Inlet from permit applications through surveys and further permitting procedures, eventually to drilling. Government agency involvement, with the exception of the USGS, is concentrated in the first nine months after the lease sale. Most survey work took place between February and May, 1978. The maximum activity occurred during August of 1979, when three rigs were drilling. Total sale activity over time is more thoroughly discussed in the section on employment.

DRILLING PHASE

Well Data, Since the lease sale in October 1977, six wells have been drilled and completed in the Lower Cook Inlet, and one is currently being drilled as of January 1980, Figure 3 shows the location of each well. Three operators, Marathon Phillips and Arco, have been active in the area. Exploratory drilling of wildcat wells is characterized by "tight holes, " which require strict confidentiality y of all details which might give competitors information about the results of drilling. This understandable reluctance of operators to share information which they have acquired very expensively has somewhat limited the data collected on the wells. All the information in this section is either publicly available or has been supplied by the operators.

Marathon's drilling program was the first to get underway with a well in Block 318, in the northeasternmost isolated section of the lease sale area (C) CSY-0086 #1). The well was spudded on July 21, 1978, approximately nine months after the sale, and took five months to complete. The results of this first well appear to have been the most promising to date. Petroleum Information (December 20, 1978) reported that a drillstem test recovered thirty-one degree gravity oil in "non-commercial volumes" from a depth between 9,400 and 10,057 feet. Marathon then moved to Block 2 at the southern end of the lease sale area. This proved to be a very exposed location for winter drilling and the first well in the block was abandoned in April, after having drilled only 2,797 feet in over three months (OCS Y-0168 #1). During this period, the drillship, Diamond M Dragon, was moved off location to a more sheltered anchorage for four weeks while waiting for the weather

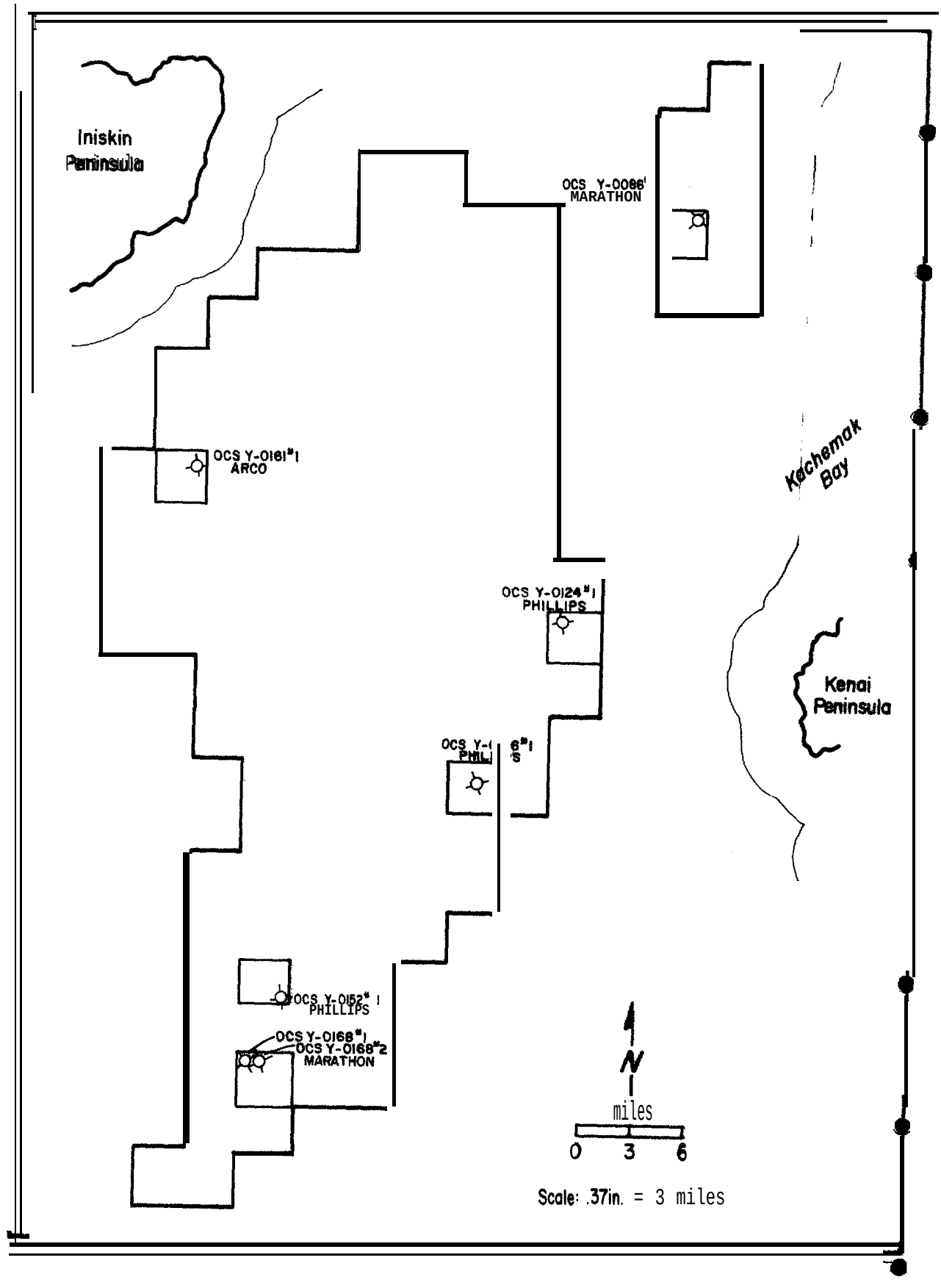


Figure 3. Location of Wells Drilled Through January 1, 1980, Lower Cook Inlet Lease Sale C.I.

to improve. A second well in Block 2 was spudded on April 28 and plugged and abandoned on August 21, 1979 (OCS Y-0168 #2). Marathon then suspended its Lower Cook operation and there is no indication that any further wells are planned.

Phillips began operations in October 1978, with an initial drilling plan for four wells, two of which have been completed and a third is in progress. All three are in the southern half of the main area of sale tracts, but the fourth planned well is in the isolated northeast section. Both completed wells have been plugged and abandoned (OCS Y-0124 #1 and OCS Y-0136 #l). The latest well was at a depth of 9,000 feet on January 31, 1980 (OCS Y-0152 #1).

Despite applying for permits soon after the lease sale, Arco did not spud its first well until July 1979. The well, in Block 572, was plugged and abandoned in January 1980 (OCS Y-0161 #l). Arco plans to drill at least one more well in the Lower Cook before the Dan Prince jack-up rig moves to Norton Sound in the summer of 1980. It is expected that the location will be Block 401.

Details of the seven wells that were drilled in the period October 1977 to January 1980 are summarized in Table 5. With the exception of the weights of materials used, the information in the table was derived from published sources or supplied by the operators. The material weights were calculated on the basis of the following estimated daily consumption provided by the operators.

	Marathon	Phillips	Arco
Drill water	15,000 to 200,000 gallons	300 barrels	380 barrels
Fuel (rig and boats)	3,000 gallons	300 barrels	111 barrels (rig) 2,400 gallons (rig tenders)

Table 5

WELLS DRILLED

Well	Ocs Y-0086 #1	OCS Y-0124 #1&1a	OCS Y-0168 #1	OCS Y-0168 #2	OCS Y-0136 #1	OCS Y-0161 #1	OCS Y-0152 #1
k	318	668	2	2	798	57'2	970
ator	Marathon	Phillips	Marathon	Marathon	Phillips	Arco	Phillips
ling Vessel	Diamond M. Dragon	Ocean Bounty	Diamond M. Dragon	Diamond ?1. Dragon	Ocean Bounty	Dan Prince*	Ocean Bounty
Location	12 miles SW of Anchor Point 23 miles W of Home r	33 nautical miles SW of Homer	68 miles SW of Home r	68 miles SW of Homer	41 nautical miles SW of Homer	55 miles SW of Home r	56 nautical miles SW of Homer
r Depth	108'	280'	550 '	542 '	260 '	131'	513'
1 Depth	13,315'	11,246'	2,797'	8,907'	10,324'	14,975'	
Spud	July 21, 1978	Oct. 20, 1978	Jan. 11, 1979	Apr. 28, 1979	May 23, 1979	July 15. 1979	Sept. 24, 1979
Abandoned	Dec. 19, 1978	May 15, 1979	Apr. 27, 1979	Aug. 21, 1979	Sept. 21, 1979	Jan. 22, 1980	
ng Depths							
0"	374'		814'				
0"	697'	1,355'	1,345'	1,361'	1,375'	1,242'	1,667'
3-3/8"	2,546'	4,424'		2,725'	4,832'	4,635'	4.955'
9-5/8"	6,948'	10,363'		7,027'		12.580'	
7"	6,651' to 10,020'						
rials used† in tons)							
ater	9,621-1,282	11,441	4,810-6,414	6,623-8,830	6,350	12,629	6,770
uel (rig and supply boats	1,386	8,240	945	954	4,574	4,025	4,876
ubular goods	353	428	68	264	211	528	208
ud	N/A	N/A	N/A	N/A	N/A	1,000 barite-650 tons	N/A
ement	N/A	N/A	N/A	N/A	N/A	bentonite-350 tous 270 tons	N/A
dents	none reported	none reported	none reported	1 death Aug. 6th	none reported	1 minor personal injury Aug. 17th	none reported
results m Petroleum rmation)	"test below 7,400' recorded 31 degree gravity oil in 'non-commercial volumes'"		"Abandoned due to weather"	"NO shows"	"Dry hole"		
ent status	P/A	P/A	P/A	P/A	P/A	P/A	still drilling; 1/31/80

September 1979 Borgston Dolphin

timated by Northern Resource Management: see text

'cc: Petroleum Information, Marathon, Phillips and Atlantic Richfield.

The Dan-Tex Corporation, owners of the Dan Prince (formerly Borgston Dolphin), provided their daily fuel use by month. These are:

September	1979	11.3 tons
October	1979	13.1 tons
November	1979	15.7 tons
December	1979	15.7 tons
January	1980	11.1 tons

These figures are close to Arco's average estimate of 111 barrels per month (fourteen tons).

All quantities were converted into tons to provide a consistent unit of measurement between the operators and to allow comparison with Table III-45a in the Final Environmental Impact Statement on the Lower Cook Inlet lease sale, which contains estimates of materials required for exploration wells. [1] The weight of tubular goods consumed by each well was calculated from the casing depths published in Petroleum Information. [2] Estimates of the amount of drilling mud and cement used were not available for the Marathon and Phillips wells, but Arco was able to provide very broad estimates of the quantities consumed by

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[1] The conversion factors used were:
1 barrel = 42 gallons
1 gallon of water = 8.33 lbs.
1 gallon of diesel = 6 lbs.
1 ton = 2,000 lbs .

[2] Casing weights were calculated using the following assumed weights per foot:

30 inch	310 lbs/foot
.20 inch	94 lbs/foot
13-3/8 inch	72 lbs/foot
9-5/8 inch	47 lbs/foot
7 inch	29 lbs/foot

In the case of drillships and semi-submersibles (Diamond M Dragon and ocean Bounty), casing is run from the seabed. Therefore, the water depth and the height of the rig floor (K. B.) above sea level is subtracted from the casing depth to determine the length of casing used. When drilling from jack-up type rigs (Dan Prince), casing is run from the rig floor so the quantity of casing is equal to its full depth. (Source for casing weights: British Petroleum, personal communication.)

their well. These are indicated in Table 5. The weights listed for Phillips well OCSY-0152, which was still being drilled on January 31, 1980, refer to the materials consumed to that date only.

Although three operators have been active in the Lower Cook Inlet since July of 1978, all three were drilling at the same time for only five weeks (July 15 to August 21, 1979). Therefore, the exploration phase to January 31, 1980 involved only two rigs for most of the time. This is a fairly low-key exploration effort. The total drilling timing of each well is shown in Figure 2.

Drilling Vessels. Three drilling vessels have been used in the Lower Cook Inlet since October 1977. Marathon contracted the Diamond M Dragon, a drillship from Diamond M Drilling Company of Houston. Phillips chose to use a semi-submersible type rig, the Ocean Bounty, which had been used for exploration drilling in the Gulf of Alaska. The Ocean Bounty is owned by Ocean Drilling and Exploration Compay (ODECO), New Orleans. The Borgston Dolphin, a jack-up type rig, was used by Arco. Its name was changed to Dan Prince in September 1979, when the rig was acquired by Dan-Tex of Houston. To avoid confusion, the name Dan Prince will be used throughout this report. The use of each of the three major types of offshore drilling rigs allows some comparison of the suitability of each design to Alaskan waters, The drillship, Diamond M Dragon, was subject to considerable difficulties while drilling in an exposed southerly location over the winter 1978/1979 . It was blown off location twice and was finally moved to a sheltered anchorage until the weather improved. The Ocean Bounty was also drilling at that time and, although it was reported to have been blown off location once, it lost few days due to weather.

Table 6 summarizes information about the drilling vessels. The information was obtained from the rig owners, a weekly publication called Offshore Rig Data Service, and various oil industry magazines, A more detailed breakdown of personnel on board each vessel is discussed in the section on employment,

Information about lease rates is discussed in more detail in the section of this report entitled "Summary of Drilling Costs and Lease Rates. " Fuel consumption estimates were provided by the operators and the water production capacity was obtained from data accompanying applications for "Authorizations to Discharge" submitted to the EPA. There was some inconsistency in the use of the desalination units. Marathon indicated that the unit on the Diamond M Dragon was used very little because of the expense of heating the cold seawater, On the other hand, the unit was used on the Dan Prince to provide all the rig's drinking water.

Supply Vessels. Each drilling vessel was served by two supply boats, making a total of six during the period October 1977 through January 1980. However, as with the drilling vessels, there was only a short period in July and August 1979 when all six were working. The normal arrangement was that one boat would remain at the rig as a safety boat for evacuation of the rig in case of an emergency while the other one made the trip to shore for supplies. Table 7 provides a summary of the data collected on the supply boats. Five companies were involved, with Off shore Logistics owning two boats. The boats ranged in size from the Stonington (160 feet overall length) to the Ocean Marlin (220 feet). Details of the boats, the total crew numbers, shifts, rotations and the total trips to shore bases are included in the table. A

Table 6

DRILLING VESSEL DATA

	Diamond M. Dragon	Ocean Bounty	Dan Prince formerly Borgston Dolphin)
Owner	Diamond M. Drilling, Houston, TX	ODECO, New Orleans, LA	Dan-tex, Houston, TX
Type	Drillship	Semi-submersible	Jack-up
Shape	Shipshape	Octagonal	Triangular
Dimensions	362' X 70'	340' X 265'	208' X 178'
Place of construction	Far East Shipbuilders, Singapore	Mitsubishi Heavy Industries, Hiroshima, Japan	Mitsui Shipbuilding and Engineering Comapny, Tomano, Japan
Year	1977	1976	1975
cost	$24 mm	$49 mm	S27 mm
Lease operator	Marathon	Phillips	Arco
Period of operation	7/21/78 to 8/21/79 - 3 months	10/20/78 to date - over 15 months	7/15/79 to 2/22/80 - 6 months (but returning March 1980)
Wells drilled	OCS Y-0086 #1; OCS Y-o 68 #1 & 2	OCS Y-0124 #1; OCS Y-0136 #1; OCS Y-0152 #1	OCS Y-0161 #1
Location prior to Lower Cook Inlet	Pakistan	Resurrection Bay, Alaska	Russia
Location after Lower Cook Inlet			Peterson Bay to March 1980
Daily lease rate*	Est. $35,000 to $50,000	Est. $35,000 to $40,000	Est. $35,000 to $40,000
Quarters	110	82	80
Full time personnel on board†	53	56	45
Drilling crew shift	12 hr. shift, midday-midnight	12 hr. shift, midday-midnight	12 hr. shift, midday-midnight
Drilling crew rotation	28 days on/28 days off	28 days on/28 days off	21 days on/21 days off
Crew change	½ crew change every 2nd Tuesday	18 men, 2 weeks each month ½ crew change every 2nd Tuesday	16 men, every 2 weeks out of 3
Freshwater production capacity	7,000 gallons per day (not utilized in Alaska)	5,000 gallons per day	10,500 gallons per day
Freshwater consumption (drilling)	15,000-20,000 gallons per day	12,600 gallons per day	22,500 gallons per day
Fuel consumption cw	2,500 gallons per day (rig only)	12,600 gallons per day (rig and supply vessels)	4,662 gallons per day (rig only)

Source: Marathon, Phillips, Arco, Diamond M. Drilling, ODECO, Dan-Tex, Offshore Rig Data Service, Ocean Industry.

* Estimated by Northern Resource Management. See text: Section on summary of drilling costs and lease rates.

† See tables in section on employment for details.

Table 7

SUPPLY VESSEL DATA

me	Heritage Service	Stonington	Ranger	Ocean Marlin	Vigilant	Biehl Traveler
ne r	Zapata Offshore Houston, TX	Seafarer Corporation Baton Rouge, LA	Offshore Logistics Lafayette, LA	Ocean Marine Houston, TX	Offshore Logistics Lafayette, LA	Biehl Offshore Houston, TX
illing vessel served	Diamond M. Dragon	Diamond M. Dragon	Ocean Bounty	Ocean Bounty	Dan Prince	Dan Prince
ase operator	Marathon	Marathon	Phillips	Phillips	Atlantic Richfield	Atlantic Richfield
riod of operation	July 78-Aug. 79	July 78-Aug. 79	Oct. 79-Dee. 79	Oct. 79-Dee. 79	July 79-Jan. 80	July 79-Jan 80
proximate daily lease rate	N/A	N/A	N/A	$4,000-$5,000	N/A	N/A
mensions	210′ x 40′ 17.5′ depth	160′ x 39′ 14.6′ depth	200′ x 40′ 18.5′ depth	220′ x 45′ 18′ depth	200′ x 40′ 18.5′ depth	210′
el consumption	4,000 gal/day	2,400 gal/day	4,500-7,000 gal/day	4,000-5,000 gal/day	4,500-7,000 gal/day	N/A
rsepower	6,000	3,520	7,040	7,000	7,040	7,500
rgo capacity						
1) Deck	118′ x 32′ clear	420 long tons	350 long tons	760 long tons	350 long tons	500 long tons
2) Bulk	6,000 cu.ft.	4,200 CU. ft.	4,500 cu. ft.	4,000 cu. ft.	4,500 cu. ft.	6,275 CU. ft
3) Fuel	115,800 gal.	100,000 gal.	175,560 gal.	225,000 gal.	175,560 gal.	450 long tons
4) Drill water	182,700 gal.	120,000 gal.	155,315 gal.	240,000 gal.	155,315 gal.	600 long tons
5) Potable water	41,100 gal.	13,000 gal.	14,952 gal.	25,000 gal.	14,952 gal.	100 long tons
rsonnel capacity	27	19	24	N/A	24	N/A
st of construction	$7 mm	N/A	$5 mm	N/A	$5 mm	$8 mm
ace of construction	Campbell Shipyards San Diego, CA	Belle Chase, LA	Morgan City, LA	New Orleans, LA	Morgan City, LA	Campbell Shipyards San Diego, CA
ar	1978	1976	1973	1976	1973	1977
ew size	10	9	12	10	11	10
ift hours	3 watch shift	4 or 6 hr. watches	3 watch shift	hrs. determined by each master	3 watch shift	40 hr. week
me leave	30 days on/ 30 days off	30 days on/ 30 days off	60 days on/ 40 days off (or 40/20 for locals)	30 days on/ 15 days off (or 40/20 for locals)	60 days on/ 40 days off (or 40/20 for locals)	1 month on/ 1 month off
cidents		1 death-drowning				
ckings by shore location†						
1) Nikiski	75 (monthly average 5.4)	104 (monthly average 7.4)	132 (monthly average 8.8)	101 (monthly average 6.7)	43 (monthly average 6.1)	33 (monthly average 4.7)
2) Homer	97 (monthly average 10.9)	53 (monthly average 5.9)	70 (monthly average 5.4)	61 (monthly average 3.8)	45 (monthly average 6.4)	46 (monthly average 6.6_

See text: Section on summary of drilling costs and lease rates.

Summary of all dockings in Table 10.

urce: Owner companies and trade journals.

breakdown of the crew by occupation and residency is discussed in the section on employment. A more detailed discussion of dockings and the use of shore bases is discussed in the section of shorebases and shown in Table 10. Vessel movements are discussed in the section on supply routes and shown in Table 11.

Aircraft/Helicopters. The helicopter service to all three rigs operated from Homer. Air Logistics served the Diamond M Dragon and ERA Helicopters provided service to the Ocean Bounty and the Dan Prince. Both companies used Bell 212 helicopters. Marathon chartered a fixed-wing plane from Andy's Flying Service of Kenai to transport crew members from Anchorage to Homer. Phillips chartered Kenai Air Service for crew transport and Arco relied more on schedule services. All three companies, however, used spot charters when necessary. Kenai Air, for example, had worked for all three companies, but only had a long-term contract with Phillips.

Details of the chartered fixed-wing planes and helicopters are summarized in Table 8. Each helicopter required a crew of two pilots and one mechanic, all located in Homer. Although, on the average, two to two and one-half flights a day were made to the rigs, the helicopters were on twenty-four hour call. The crews worked an even time rotation system of seven days on and seven days off, or fourteen and fourteen. While in Homer, the crews were accommodated in apartments provided by the companies. The fixed wing charters flew out of their home bases in Kenai, so no rotation system was required. Nearly all fixed-wing flights were made during the day and the pilots generally worked a standard 8:00 a.m. to 5:00 p.m. day, although they were technically "on call".

TABLE 8

CHARTER AIRCRAFT AND HELICOPTER DETAILS

Type:	Fixed Wing Charter	Fixed Wing Charter	Helicopter	Helicopter
Operator:	Phillips, ARCO	Marathon	Marathon	Phillips, ARCO
Drilling Vessel:			Diamond M Dragon	Ocean Bounty, Dan Prince
Owner:	Kenai Air Service	Andy's Flying Service of Kenai	Air Logistics	E.R.A.
Make:	Rockwell Aero Commander	Piper Navahoe Chieftan	Bell 212	Bell 212's
cost :	$350,000	$200,000	$1.2 million VFR; $1.4 million IFR;	$1.2 million VFR; $1.4 million IFR;
Hourly Rate:	$365 per hour	$425 Homer to Anchorage	$995 per hour	$995 per hour
1 Year Lease (Average):	N/A	N/A	$60,000 + $400 per hour (IFR)	$60,000 + $400 per hour (IFR)
Cargo Capacity:	600 lbs.	1800 lbs.	3000 lbs.	3000 lbs.
Personnel Capacity:	9 passengers	9 passengers	12 passengers	12 passengers
Crew Size:	2 pilots	1 pilot (+ 1 backup)	2 pilots and 1 mechanic	2 pilots and 1 mechanic for each operator
Shift Hours:	On call, primarily 8am - 6pm	8am - 6pm. Very occasional night flight	24 hour call	24 hour call
Rotation:			7 days on/7 days off	14 days on/14 days off
Total Crew:	2	2	6	12
Base:	Kenai Airport	Kenai Airport	Homer Airport	Homer Airport
Flights:	Contract with Phillips to transfer crews. spot charters ARCO and Marathon	Anchorage - Homer with pick-ups at Kenai as required. Average 60 hours flying per month on contract.	Homer - Diamond M Dragon Est. 1 - 2 flights per day	Homer - Ocean Bounty Average 1½ - 2 flights per day. Homer - Dan Prince average 2 - 2½ flights per day.

The lease rates indicated in the table are not indicative of actual contract rates with the companies. The fixed-wing charter figures are short-term hourly rates. Long-term (one year or more) contracts would be considerably less, but rates were unavailable. The helicopter rates are average one-year contract type rates and do not reflect actual contracts with the companies. The short-term hourly rates for the helicopters are also indicated in the table for comparison.

Shore Bases. Table 9 gives details of the three major shore bases utilized by supply boats and helicopters serving the drilling vessels operating in the Lower Cook Inlet. Supply boats used the Nikiski rig tenders dock and the Homer city dock, while helicopters flew from the Homer Airport. In addition to these three major bases, other bases were utilized to a lesser extent. The Seward dock was used sporadically to feed supplies to Kenai by two companies. The Kenai and Anchorage airports were utilzed to transfer crews, and most crews spent the night in Anchorage on their way to the vessels. The Port of Anchorage received supplies such as food and materials which were shipped via Sealand service barge or Totem Ocean Trailer Express (Tote). Finally, the Seldovia dock was used as a shore base for about a week by the Tetra-Tech survey vessel Sitkin while the Homer dock was being repaired. The three major shore bases are discussed in more detail below.

The Nikiski rig tender dock is part of the port and industrial complex located about ten miles north of Kenai. It is an earth-filled dock capable of handling three to four 200 foot supply boats at one time and has been in operation for some years, serving the drilling and production platforms in the Upper Cook Inlet. The dock is owned and

TABLE 9

MAJOR SHORE BASES UTILIZED

	Nikiski Rig Tenders Dock	Homer City Dock	Homer Airport (Helicopter Bases)
Location:	11 miles north of Kenai	End of Homer Spit	Base of Homer Spit
Land Area:	5 to 10 acres	7 acres	1-1½ acres N.W. side; 1½ acres S.E. side
Facilities:	Dock, warehouse, open storage, water, fuel, & cargo load & unload	Dock water, fuel & cargo load & unload, 2 warehouses	Hangars, landing pad, office space, parking, fuel
Capabilities:	Service 3 to 4 boats at one time	Service 1 to 2 boats at one time	N.W. hangar - service 2 helicopters plus office; S.E. hangar - service 1 helicopter plus office
Public / Private Services & Fees:	Water - $300 per boat Dockage - $40/hr. or $1 foot/24 hrs, Wharfage - $3/ton. Storage by sq. ft. Stevedoring-union wages.	Water - 1.74/1000 gal. Dockage -$50-$125. Wharfage - $4/ton. Crane operator, light cargo. Stevedoring-union wages.	N.W. hangar - leased to ARCO . All services. S.E. hangar - private hangar, all services. Fees unknown.
Period of Use:	July '78 to Feb. '80.	October '78 to Feb. '80.	N.W. hangar - 9/78 to Feb. '80. S.E. hangar - 7/78 to 9/79.
Frequency of Use:	Avg. 25.7 docking/mo. between 7/78 to 2/80. Peak - 11/78, 47 dockings.	Avg. 26.6 docking/mo. between 12/78 to 2/80. Peak - 4/79, 35 dockings.	Estimate between 1½ to 3 flights/day/drilling vessel. Max. 6-8 flights/day.
Contractor:	Crowley Maritime	City of Homer	N.W. hangar - Maritime Helicopters; S.E. hangar - Earl Cooper.
Employment:	3 management staff; union labor - 13-15 men/40 hr. week	Staff of 12 for entire harbor. ½ hr. spent at each docking. 1 crane operator to load boats.	N.W. hangar - 1 expediter, 1 receptionist, plus owner. S.E. hangar - 1 expediter plus owner

operated by Crowley Maritime Company and all services at the dock are privately provided. Table 10 summarizes the supply boat dockings at Nikiski. All six supply boats used the dock, The total dockings fluctuated considerably, but averaged twenty-six dockings per month throughout the period of use between July 1978 and February 1980. Peak use occurred in November 1978, with forty-seven dockings (two rigs were drilling).

The total charge for each docking at Nikiski is calculted on the basis of the length of the boat, the time it was moored alongside and the weight of the cargo loaded. In addition, there are contract charges for water and storage. The total revenue received by the dock from the Lower Cook Inlet activity was over $225,000. Perry Stockton, dock manager for Crowley Maritime, very roughly estimated that income from services provided to the Lower Cook lease area accounted for approximately fifteen percent of the dock's total revenue in 1979.

Three management staff are employed at Nikiski rig tender dock full time. Stevedoring is provided by longshoremen hired as required from the union dispatcher. A longshoreman crew consists of thirteen to 'fifteen men, depending on the time of year, and Crowley estimated that one crew works an average forty hour week at the rig tenders dock.

Open storage areas and warehousing are provided at Nikiski. Supplies of mud, materials and cement for the Lower Cook Inlet drilling vessels were stored at the dock . Fresh water is piped to dockside from a private water source. Diesel from the Tesoro Refinery is also delivered to the dockside by pipeline.

The Homer city dock is owned and operated by the City of Homer. It can accommodate up to two boats at once. Food and some materials

TABLE 10

supply VESSEL DOCKINGS AND REVENUE THROUGH JANUARY, 1980

(Homer & Nikiski)

supply Vessel	eritage Service	Stoning-ton	Ranger	Ocean Marlin	Biehl 'raveler	Vigilant	Total
Drilling Vessel	DIAMOND "M"		OCEAN BOUNTY		DAN PRINCE		
HOMER DOCK							
Period	12/78 - 8/79	12/78 - 8/'79	11/78 - 2/80	9/78 - 2/80	7/79 - 2/80	7/79 - 2/80	12/78 - 2/80
Tot al Dockings	97	53	70	61	46	45	372
Total Months	9	9	13	16	7	7	14
Monthly Average	10.9	5.9	5.4	3.8	6.6	6.4	26.6
MONTHLY AVERAGE	16.9		9.2		13		
PEAK MONTH DOCKINGS	4/79 -28		2/79 - 16		12/79 - 19		
REVENUE							$49,120
NIKISKI DOCK							
Period	7/78 - 9/79	7/78 - 9/79	10/78 - 1/80	10/78 - 1/80	7/79 - 2/80	4/79 - 2/80	7/78 - 2/80
Total Docking	75	104	132	101	33	43	488
Total Months	14	14	15	15	7	7	19
Monthly Average	5.4	7.4	8.8	6.7	4.7	6.1	25.7
MONTHLY AVERAGE	12.8		15.5		10.8		
PEAK MONTH DOCKINGS	11/78 - 24		6/79 - 27		10/79 - 20		
REVENUE	$70,700		$81,637		$26,007		$1 ,370

TABLE 10 (Continued)

SUPPLY VESSEL DOCKINGS AND REVENUE THROUGH JANUARY, 1980

(Homer & Nikiski)

supply Vessel	Heritage Service	Stoning-ton	Ranger	Ocean Marlin	Biehl Traveler	Vigilant	Total
Drilling Vessel	DIAMOND "M"		OCEAN BOUNTY		DAN PRINCE		
Total Both Docks Period	7/78 - 9/'79	7/78 - 9/79	10/78 - 2/80	9/78 - 2/80	7/79 - 2/80	4/79 - 2/80	7/78 - 2/80
Total Docking	172	157	202	162	79	88	860
Total Months	14	14	15	16	7	7	19
Monthly Average	16.3	13.3	14.2	10.5	11.3	12.5	45.3
MONTHLY AVERAGE	29.7		24.7		23.8		
REVENUE*							$228,520

Source: Homer & Nikiski Dock records.

*Includes dockage, wharfage, water, and for Kenai only, storage costs to February 1, 1980.

and equipment were shipped to the drilling vessels via Homer, but the principal use of the dock was to take on fresh water, which was supplied from the public water system at a cost of 1. 7¢ per thousand gallons.

Table 10 summarizes supply vessel dockings at the Homer city dock . The two boats serving the Diamond M Dragon did not use Homer as a shore base until December 1978, although the drilling program had been underway since July of that year, The dock charged a flat rate dockage fee, determined by the length of the vessel. The Stonington, which is 163 feet overall length, paid $50.00 per docking, whereas the Beihl Traveler, 210 feet long, paid $125.00, In addition to these charges, wharfage of $4 per ton was charged on the weight of cargo taken aboard. The total revenue received by the Homer dock from the Lower Cook Inlet supply vessels was over $49,000. Dockings fluctuated, but averaged twenty- seven dockings per month bet ween October 1978 and February 1, 1980. The peak activity occurred in August 1979, with forty-two dockings (all three rigs were drilling). Gary Daily, the Homer city dock manager, estimated that the Lower Cook Inlet rig tender vessels accounted for about ninety percent of the activity at the dock during the exploration period.

The Homer harbor employs seven harbor officers and three maintenance men, who take care of the entire harbor, Their duties with regard to the supply vessels normally required very little time and no extra personnel were hired due to the sale activity. For all cargo loadings less than one hundred tons, a private crane operator was employed to load the boats. The crane was used at each docking from

one to eight hours. For all cargo in excess of one hundred tons, longshoremen are called in from the union. At the time of the interview on April 3, 1980, longshoremen had been called for the first time to load a supply vessel in Homer, (Major heavy equipment was loaded at Kenai.)

The Homer city dock has a limited staging area due to its location at the end of the Homer Spit. It consists of two warehouses and seven acres of open area. Neither the open area nor the warehouses were used for storing equipment for the Lower Cook sale. Some small privately owned storage has been leased to the operators, but it consists of less than one acre. Manley Terminals, who receive truck shipments in Homer, indicated that some major supplies are stored and shipped from Homer, but most of the materials coming into Homer are smaller everyday type of materials such as drill bits, tools, smaller machines, food, spare parts, etc,

Helicopters serving the drilling vessels operated out of the Homer Airport. Two new helicopter hangars were built to accommodate the expected traffic. Arco has leased one hangar from Maritime Helicopters, of Homer, and it serves both the Phillips and Arco rigs, The hangar occupies about one to one and a half acres on the northwest side of the airport. In addition to a pad and shelter for the helicopters, it contains a waiting room and office space. One secretary/receptionist was hired as a result of the expected activity. The land is leased from the state,

The second hangar was constructed on private property near the southeast end of the airport, Air Logistics leased this hangar for Marathon's activities. The hangar is smaller than the Maritime hangar

but also has office space. Presently, this hangar is not being utilized for helicopter operations. The owner indicated that his original intent was to build a shop on the property, but he was offered a long-term lease from Air Logistics if he would build a hangar.

All three operators predicted in their "Notice of Support Activity" that there would be an average of two flights a day to the drilling vessels, Discussions with the operators, helicopter companies and pilots indicated an average of between one and two and a half flights per day, depending on the operator. Actual figures were unavailable. Offshore Logistics indicated an average closer to one to one and a half daily flights for Marathon. The local ERA expeditor and pilots indicated an average of one and a half to two for Phillips and two to two and a half daily flights for Arco. The FAA kept an informal count of all aircraft using the Homer Airport over the past few years and they noticed no appreciable increase in total landings and takeoffs for all aircraft during the drilling phase.

With the exception of the two hangars at the Homer Airport, there was no special construction of shore facilities to support exploration in Lower Cook Inlet, Supply boats used Nikiski rig tenders dock, a well-established offshore exploration service base and the Homer city dock ,' which was able to accommodate the boats with existing facilities. The presence of an already existing infrastructure was a major factor in mitigating impacts associated with the sale activity.

MAJOR SUPPLY ROUTES

The supply routes used to transport survey vessels, drilling vessels, supply boats, consumables and personnel to the Lower Cook Inlet sale area will be discussed by topic. A summary of vessel movements is shown in Table 11.

Survey Vessels. Homer was used as the shore base for survey boats operating in the Lower Cook Inlet. Dames and Moore, who were responsible for most of the surveys, leased local Homer boats: Big Valley, Nightwatch and Seawife, The Sitkin, a Seattle-based boat, was used by Tetra-Tech for its survey, but it had been working in the Lower Cook prior to the Tetra-Tech survey. No survey vessels were moved to Alaska especially for survey work related to the Lower Cook Inlet after October 1977.

Drilling Vessels. The Diamond M Dragon had been drilling in Pakistani waters before moving to the Lower Cook Inlet. It traveled to Alaska via Singapore, where it was refitted for the colder climate, The Ocean Bounty was already in Alaska, having been used by Texaco to drill an exploration well in the Gulf of Alaska, After completing the Texaco well in February 1978, the Ocean Bounty was anchored in Resurrection Bay off Seward. The Dan Prince came to the Lower Cook Inlet from Russian waters in the Pacific. As of January 31, 1980, the Ocean Bounty and the Dan Prince were still in Alaska. The Ocean Bounty was on location in the Lower Cook Inlet and the Dan Prince was in Peterson Bay, undergoing repairs before resuming drilling. The Diamond M Dragon went to Manila and is now drilling in the Indian Ocean,

Table 11

VESSEL MOVEMENTS

Name	Location Prior To Lower Cook Inlet	Location After Lower Cook Inlet
Survey Vessels		
Sitkin	Alaska	N.A.
Big Valley	Home r	Homer
Night Watch	Home r	Homer
Sea Wife	Homer	Homer
Drilling Vessels		
Diamond M. Dragon	Pakistan	
Ocean Bounty	Alaska - Resurrection Bay	Lower Cook Inlet
Dan Prince	Russia	Alaska - Peterson Bay
Supply Vessels		
Stonington	Gulf of Mexico	Gulf of Mexico
Heritage Service	New Vessel (California)	East Coast
Biehl Traveler	Baltimore Canyon	Lower Cook Inlet
Ocean Marlin	Gulf of Mexico	California - dry dock
Vigilant	Gulf of Alaska	Lower Cook Inlet
Ranger	Gulf of Alaska	Lower Cook Inlet

Supply Vessels. The Stoningham came from the Gulf of Mexico to service the Diamond M Dragon and returned to the same area when Marathon's Lower Cook drilling program came to an end. The Heritage Service was built in California and sent to the Lower Cook Inlet, It is now on the east coast. The Ocean Marlin was previously located in the Gulf of Mexico and the Beihl Traveler in the Baltimore Canyon. Both boats were in dry dock in California early in 1980, but the Traveler has since returned to the Lower Cook Inlet. The two Offshore Logistics boats, Vigilant and Ranger, have remained in Alaska since being used in the Gulf of Alaska exploration. They are still working in the Lower Cook Inlet.

Helicopters. The three helicopters used were transported from Anchorage to Homer and operated out of Homer. Charter aircraft flew out of their home base of Kenai.

Water. Fresh water is transported to the drilling vessels by supply boat from either Homer or Nikiski. Homer city dock keeps a record of water sales, which shows that apart from the first four months of exploration activity, water was supplied from Homer throughout the period. Generally, however, the figures suggest that other sources, such as the desalination units aboard the drilling vessels and supplies from Nikiski supplemented Homer water. Water at Nikiski is sold on a flat rate monthly contract and no records of the quantity of water taken on board are available. At both the Homer city dock and the rig tenders dock at Nikiski, fresh water is piped to dockside.

Fuel. Diesel for the drilling vessels and supply boats was obtained at the Nikiski rig tenders dock, Operators purchased the fuel from Tesoro and from Alaska Sales and Service. Tesoro diesel was

delivered to the dockside by pipeline, whereas fuel from Alaska Sales and Service was transported by truck. Very occasionally, diesel was purchased from the Chevron jobber at the Homer dock, Jet fuel for the helicopters was purchased in Kenai and trucked to Homer.

Tubular Goods, Cement and DrillingMud. All three operators anticipated that consumables such as tubular goods, mud materials and cement required for the Lower Cook Inlet would be supplied from stocks already in the Kenai area:

> The heavy supplies, such as tubular goods, cement, mud materials and drilling tools are already in stock in... existing supply yards and warehouses in the Kenai area. [Marathon]
>
> Local purchase of large quantities of major supplies and equipment , . . is not anticipated. [Phillips]
>
> The heavy supplies , . . such as tubular goods, mud materials, cement, drilling tools and fuel are already in stock in Atlantic Richfield Company's yard or various vendor's yards. [Arco][3]

Suppliers of mud materials and cement confirmed that no special deliveries were required for the Lower Cook Inlet activity, Nevertheless, stocks had to be replenished, so there were indirect transport impacts. The supply routes for the various types of consumables are discussed in turn .

Tubular goods are generally purchased by operators from outside Alaska and stored in their pipeyards until required, Phillips shipped casing via Alaska Hydrotrain to Seward, then to Moose Pass by rail,

[3]Taken from the "Notice of Support Activity" submitted to U. S, Geological Survey.

where it was trucked to Kenai and loaded on the supply boats to the rig.

The tubular goods used by Arco had been ordered for exploration wells in the Gulf of Alaska and were found to be surplus. They were stored at Arco's yards in Yakutat and Kenai. The materials from Yakutat were transported by supply boat directly to the Dan Prince. Those from Kenai were trucked to the Nikiski rig tenders dock (approximately one mile) and loaded on supply boats.

Drilling mud was supplied to the three operators by three companies: Dresser supplied Marathon; Imco supplied Phillips; and Baroid supplied Arco. All three companies have storage yards in the Nikiski dock complex, from which they supplied the Lower Cook Inlet drilling vessels. Supply boats would normally take on loads of mud materials at the rig tenders dock once or twice a week. In general, it was not necessary to transport drilling mud on public roads between the vendor's yard and the supply boat. Occasionally, however, if mud was required offshore urgently or if supply boats were not using Nikiski as a shore base, mud was transported by truck to Homer.

The most common route for mud materials to be delivered to Nikiski is by sea to Anchorage aboard a Totem Ocean Trailer Express or Sealand Service barge, then by truck to Nikiski. Various carriers are used, including Drilling Mud Haulers and Mukluk Freight Lines. Baroid estimated that mud was transported from Anchorage to their yard at Nikiski six times a month, Imco eight times a month and Dresser four times a month. Imco also brings mud materials into Alaska via Seward and directly into the Nikiski dock. Road transport of mud between

Seward and Kenai is much less frequent than the Anchorage-Kenai route.

Halliburton supplied cement to all three drilling vessels. They obtained cement from Kaiser Cement Corporation, which is located on the Nikiski dock. The cement is brought directly to Nikiski by barge and is stored either at Kaiser or at the Halliburton storage area on the dock . It was transported to the drilling vessels by supply boat from Nikiski, each vessel receiving between one and five loads a month. Cement is not usually transported by road.

Catering Supplies. Almost all the food for the Lower Cook Inlet was bought in Seattle and shipped to Anchorage by Tote or Sealand. It was then trucked to Nikiski or Homer by Lynden Transport Inc. Universal Services Inc. , who provided the catering services on all three rigs, estimated that less than one truckload a week was needed to supply a drilling vessel. Early in 1980, one load of food a week was arriving in Homer for the Ocean Bounty according to Manley Terminals of Homer, who receive freight deliveries. Dairy goods and produce were purchased in Alaska, either from Peterkin Distributors in Kenai or in Anchorage. Food was normally taken off shore by supply boat, but occasionally urgent supplies were transported by helicopter.

Personnel. Most offshore workers in the Lower Cook Inlet lived outside of Alaska. Drilling crews appeared to come predominately from Texas, Louisiana and Mississippi, and the catering crews were recruited largely in Seattle. The offshore workers usually commuted between their home state and Alaska every twenty-one or twenty-eight days, with their employer paying all travel expenses. Generally, crews entered Alaska via Anchorage International Airport, stayed overnight in

Anchorage, flew to Homer either on scheduled airlines or by charter, and traveled to the drilling vessel by helicopter from Homer.

Crew change day on the Ocean Bounty was every other Thursday. Twice a month, a relief crew arrived in Anchorage on a Wednesday, were accommodated overnight at the Holiday Inn and, the following morning, flew by charter plane to Homer. Phillips chartered aircraft from Kenai Air Service. The working crew then left Alaska on Thursday, with no overnight stops in Alaska.

Crews on the Dan Prince also changed on a Thursday. The changeover occurred two weeks out of every three. The incoming crew stayed at the Northern Lights Inn on Wednesday night and caught an early morning Wien Air Alaska flight to Homer.

Crews on the Diamond M Dragon worked a twenty-eight day rotation, changing crews every other Tuesday. They overnighted in Anchorage and flew to Homer via charter aircraft (Andy's Flying Service). The working crews were flown directly home after their tour, with no overnight stops in Alaska.

ENVIRONMENTAL PROTECTION AND ACCIDENT DATA

Lease stipulation number three required that, before drilling in the Lower Cook Inlet, operators prepare an environmental training program for all personnel involved in exploration (including employees of sub-contractors), The oil companies were also required by OCS Order Number 7 to develop an oil spill contingency plan. Both documents were submitted to the USGS with the application for Permit to Drill. Crowley Environmental Services Corporation, who prepared the oilspill contingency plan for the Cook Inlet Response Organization, prepared similar plans for Marathon and Phillips, Woodward Clyde prepared the oil spill contingency plan for Arco. The plans detailed available oilspill cleanup equipment and predicted response times. The environmental training programs were monthly in-house courses, partially consisting of films shown on the drilling vessels, although Crowley does provide special schools on environmental aspects of oil spills.

Environmental protection was also enforced through the regulations and permits controlling offshore exploration. Discharges from the drilling vessels to the sea were limited by the Environmental Protection Agency's "Authorization to Discharge, " with authority to visit the rigs to check compliance. USGS orders and regulations were designed to ensure safe drilling practices, The Lower Cook Inlet lease sale was the first with USGS inspectors on the drilling vessels full time, The inspectors observed drilling practices and reported any incidents which threatened environmental damage, for example, oil leakages or unauthorized discharges. The inspectors did not report any such incidents during the period of this study. However, Marathon indicated that

they had lost one small pallet of fittings overboard. On another occasion, Marathon went back on a previous location to retrieve anchors from the seabed.

There were two deaths associated with the exploration effort. In August 1979, an employee on the Diamond M Dragon was killed after being hit by equipment. In the same week, a crew member of the Stonington was drowned in an alcohol-related incident on the Homer city dock . Aboard the Dan Prince, there was one minor personal injury, also in August 1979, in which an employee's finger was crushed.

There were no offshore collisions, and Homer fishermen indicated that after proper corridors were established (in 1979), loss of fishing gear was minimal, Apparently, the supply vessels had interfered with crab fishing gear so that an undisclosed number of crab pots were lost on the bottom of the bay. Both the fishermen and the operators indicated the vessels had rescued a number of craft in danger and had been of help in forecasting weather, particularly in the lower inlet near the Shelikof Straits. The reaction of fishermen varied considerably at the onset of exploration activity. However, it appears that as the activity proceeded and the problems settled, the exploration and fishing controversies were minimized.

SUMMARY OF DRILLING COSTS AND LEASE RATES

This section contains a discussion of the daily lease rates of drilling vessels, supply boats and helicopters used in Lower Cook Inlet exploration activity.

Drilling costs are strictly confidential and the study team was unable to obtain precise figures for the daily costs of any major items of expenditure. However, all three operators indicated their total estimated drilling costs. These three estimates were remarkably close. Marathon's daily cost was $72, 000; Phillips estimated $70, 000; while Arco's cost fell between $70,000 and $75,000. These costs included expenditures for the drilling vessel, supply boats, aircraft, personnel, supplies, services and, presumably, administration.

In order to break down these costs into their individual components, estimates from various sources were used. These included published materials, sources within the industry including the operators themselves, contractors for the operators, service companies and others. In all cases, no precise figures were given, only rough estimates and "average" lease amounts.

The lease rate for a drilling vessel included the use of the vessel itself and all the personnel needed to operate the vessel, drill the well and provide accommodations for the personnel on board, such as food and maintenance. The rate does not generally include such consumables as cement, tubular goods and fuel, or special services such as diving, logging or cementing, In addition, the lease rate may vary depending on whether the vessel is drilling or on standby due to weather, etc,

As far as the study team could determine, none of the vessels operated under variable rates in the Lower Cook Inlet.

Generally, lease rates for drilling vessels are determined by the type of vessel, its size and its age. According to the Oil and Gas Journal, the most expensive type of offshore drilling rigs are jack-ups, followed by semi-submersibles and, finally, drillships. In the Gulf of Mexico in September 1979, for example, it was estimated that jack-ups could command fifty percent higher lease rates than drillships ($24,500 to $27,800 compared with $16,000 to $19,000). In a more nearly comparable situation, an article in the Oil and Gas Journal in January 1980 suggested that lease rates for North Sea drilling vessels are rising because there is no longer a surplus of offshore drilling rigs. It estimated that the average rate for semi- submersibles already in the North Sea for the first six months of 1980 will be $37,000 per day and that new arrivals could command $40,000 per day.

Another published rule of thumb for estimating lease rates is $1, 100/day per million dollars construction cost (Oil and Gas Journal, September 24, 1979). This coversion would give the following lease rates for vessels used in the Lower Cook Inlet:

	cost	Lease Rate
Diamond M Dragon	$24 mm	$26, 400/day
Ocean Bounty	$49 mm	$53 ,900/day
Dan Prince	$27 mm	$29, 700/day

The investment in the Ocean Bounty is approximately twice that of the other two drilling vessels. Therefore, if the $1, 100/day per million dollar rule is followed, the daily lease rate would be about twice as high. However, there appeared to be very little difference between the overall cost figures supplied by all three operators.

Lease cost estimates for drilling vessels obtained in Alaska from various sources ranged all the way from $30,000 to $50,000 per day for the vessels. On August 31, 1979, the Kenai Peninsula Clarion published a report indicating the Diamond M Dragron's rate at $50,000 per day.

The information collected on drilling vessel lease rates has not indicated clearly what the lease rates were for the off shore drilling rigs in the Lower Cook Inlet. The best median estimate would likely be between $35,000 and $40,000 per day; this estimate is probably high for the average drillship (possibly due to the fact that it had to be refitted for the cold weather, etc.), about average for the semi-submersible and a little low for the jack-up rig.

All three operators used two supply vessels to support their drilling operations, Local industry people estimated that supply vessel lease rates vary between $3,000 and $7,500 per day, excluding fuel. A spokesman for Ocean Marine, owners of the Ocean Marlin, said that they charged between $4,000 and $5,000 per day. Arco confirmed that they paid approximately $5,000 per day per boat. No published information about supply vessel lease rates was found.

The Ocean Marlin was an average size supply vessel in the Lower Cook Inlet operation. Assuming that all supply boats were leased at similar rates, the cost to operators for two support vessels would have been between $8,000 and $10,000 per day, excluding fuel,

Helicopters and charter aircraft were leased both on a short-term hourly rate and a longer-term flat fee, plus a smaller hourly rate. The Lower Cook operators utilized the longer-term rates for helicopters and used both methods for charter aircraft.

The only model helicopter used in the Lower Cook Inlet was a Bell 212, nine passenger model, outfitted for IFR operations. The craft leases for $995 per hour on a short-term basis, Exact long-term rates were unavailable, but a spokesman for ERA indicated that an average year lease on an IFR equipped model would cost approximately $60,000 per year plus $400 per hour. This includes only the aircraft, pilots and mechanics. If the helicopter flew an average of three hours per day (probably the hourly minimum), the lease cost would run approximately $1,400 per day. Arco indicated their average daily expenditure was between $2,000 and $2,500 per day, This cost presumably would include fuel and expediter salary and living, as well as hangar and office space rental in Homer.

Short-term rates for the charter aircraft were approximately $350 to $450 per hour. The oil companies had long-term leases on the aircraft used to transport crews from Anchorage to Homer, but their rates were unavailable.

Based on the information discussed above, the daily lease rates for the drilling vessel, two supply boats and one helicopter would amount to between $44,000 (if all the low figures are used) and $51,000 per day (using the high figures). If the total drilling costs of the operators are accurate, this leaves between $15,000 and $25,000 per day for consumables (tubular goods, mud, cement, water and fuel), personnel (engineers, geologists, expediters and administrators), office space (Homer, Kenai and, Anchorage} and services (logging, cementing, diving, etc,).

EMPLOYMENT , RESIDENCY AND WAGES

This section summarizes direct employment by occupation, estimated residency and estimated wages, where possible, for individuals involved in the Lower Cook Inlet lease sale from October 1977 to January 1980. The data is organized by direct employment associated with each drilling vessel and direct employment associated with the entire sale. Employment, residency and wages by drilling vessel are broken down into full time off shore workers (drilling and supply vessels), part time offshore workers (service companies) and onshore workers (pilots, administrators, etc.). This information is shown in Tables 12, 13 and 14. Employment associated with the entire sale includes primarily administration and regulation of the sale process, including permit activites. This information is summarized in Table 15.

The table headings are generally self-explanatory, with a few exceptions. The third column, entitled “Rotation” is changed in the tables when discussing part time offshore employment. Since part-time workers don’ t rotate, the column is not needed. However, an estimate of the total time spent on the rig is needed and is placed in this column for part time workers only. The column entitled “Undetermined Alaska” under the residency section of the tables includes those individuals who are Alaska residents but do not live in Homer, Kenai, Anchorage, or whose exact residency is unknown. In addition, it is assumed in the tables that individuals worked twelve hour shifts on the drilling vessels. All vessels worked from noon to midnight shifts.

TABLE 12

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DAN PRINCE

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
FULL TIME OFFSHORE									
OPERATOR - Atlantic Richfield									
Drilling Foreman	1	7 days on/ 7 days off	2	2					N/A
Geologist	1	"	2	2					N/A
DRILLING CONTRACTOR - Dan-Tex									
Drilling Superintendent	1	21 days on/ 21 days off	2					2	Estimates for the drilling crew are discussed in the text.
Drillers	2	"	4					4	
Derrickmen	2	"	4					4	
Pit Watchers	2	"	4					4	
Floorhands	6	"	12					12	
Roustabouts	6	"	12				1*	11	
Crane Operators	2	"	4					4	
Electricians	1	"	2					2	
Materials Man	1	"	2					2	
Electro-Mechanic	1	"	2					2	
Medic	1	"	2					2	
CATERING CONTRACTOR									
Universal Services, Inc.	T	28 days on/ 14 days off	11					11	
SERVICE COMPANIES									
Cementing	2	21 days on/ 21 days off	4					4	
Mud Logging	5	21 days on/ 7 days off	7	7					

TABLE 12 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DAN PRINCE

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
SERVICE COMPANIES (Continued)									
Mud Engineer	1	7 days on/ 7 days off	2	1	1				
Weather Observers	1	"	2	2					
SUBTOTAL FULL TIME ON DRILLING VESSEL	145		82	16	1		1	64	
SUPPLY VESSELS									
Alaska Vigilant									
Master	1	60 days on/ 40 days off	1				Company	1	N/A
Mates	2	"	3					3	N/A
Engineers	1	"	1				Estimate	1	N/A
Asst. Engineers	2	"	3					1	N/A
A.B.S.	3	"	4				5 Jobs	2	N/A
Cook	1	"	2					1	N/A
Biehl Traveler									
Master	1	30 days on/ 30 days off	2					2	N/A
Mates	2	"	4					4	N/A
Engineer	1	"	2					2	N/A
Asst. Engineer	2	"	4					4	n/A
A.B.S.	3	"	6					6	N/A
Cook	1	"	2					2	N/A
SUBTOTAL FULL TIME ON SUPPLY VESSELS	20		34				5	29	

TABLE 12 (Continued)

EMP LOYMENT , RESIDENCY AND WAGES ASSOCIATED WITH THE DAN PRINCE

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Total Employment (Including Relief Crew)	Residency"					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outs i de	
PART TIME OFFSHORE									
OPERATOR									
Engineer	.13	2 days, twice a month (.8 man months)	1		1				N/A
SERVICE COMPANIES									
Logging	.25	5 days on 3 occasions (1.5 man months)	3		3				$21,000 - $45,000/yr.
Diving	.40	2 days, once a month (2.4 man months)	6		6				$19.61/hr. surface $39.22/hr. diving
Casing	.05	3 days, 3 occasions (.3 man months)	3		3				N/A
Wellhead	1	"	1		1				N/A
Fishing	1	Once	1		1				N/A
SUBTOTAL PART TIME ON DRILLING VESSEL	(approx.) 1**	5.0	15		15				

TABLE 12 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DAN PRINCE

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
FULL TIME ONSHORE									
OPERATOR									
Administration & Management	3		3						N/A
Expediters	2		2		1	1			N/A
DRILLING CONTRACTOR									
Administration	2		2	2					N/A
Materials Man	1		1	1					N/A
Secretary	1		1	1					N/A
AIRCRAFT CONTRACTOR									
Helicopter									
Pilots	2	7 days on/ 7 days off	4	4					$2000 - $2500/mo. plus flight time
Mechanic	1		1			1			N/A
Expediter & Secretary	1		1	.5		.5			N/A
SUPPLY VESSEL									
Shore Master	1		1		1				N/A
SUBTOTAL ONSHORE	14		16	11.5	2	2.5			
TOTAL OFFSHORE. ONSHORE & PART-TIME	80		147	27.5	18	2.5	6	93	
TOTAL MAN MONTHS @ 6 DRILLING MONTHS	479		797	1.65	23	15	36	558	

'Estimated full time equivalent of Alaskan employment.
**Approximate full time equivalent.

TABLE 13

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE OCEAN BOUNTY

	Average Persons on Board or at Work	Rotation	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
FULL TIME OFFSHORE									
OPERATOR - Phillips									
Drilling Supervisor	1	14 days on/ 14 days off	2					2	N/A
Geologist	1	"	2					2	
DRILLING CONTRACTOR - ODECO									
Ship Crew									
Captain	1	28 days on/ 28 daysoff	2					2	Estimates for drilling crew are discussed in the text.
Control Room Operator	2	"	4					4	
Motormen	4	"	8					8	
Drilling Crew									
Senior Tool Pusher	1	"	2					2	
Tower Pusher	1	"	2					2	
Drillers	2	"	2					2	
Derrickmen	2	"	2					2	
Floormen	8	"	16					16	
Crane Operators	2	"	4					4	
Roustabouts	8	"	16				1*	15	
Other									
Rig Mechanic	1	"	2					2	
Electrician	1	"	2					2	
Electronic Technician	1	"	2					2	
Radio Operator	1	"	2					2	

TABLE 13 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE OCEAN BOUNTY

	Average Persons on Board or at Work	Rotation	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
DRILLING CONTRACTOR (Continued)									
Welder	1	28 days on/ 28 days off	2					2	
Subsea Engineer	1	"	2					2	
Safety Engineer/Medic	1	"	2					2	
CATERING CONTRACTOR									
Universal Services	7	28 days on/ 14 days off	11					11	$3.50 to $5.50/hr. plus 1½ time over 40 hrs. plus $50 for complete tour
USGS									
Engineer	1	7 days on/ 5 days office	2	2					GS-8 to GS 12 plus offshore pay
SERVICE COMPANIES									
Cementing	2	21 days on/ 21 days off	4					4	N/A
Mud Logging	4	21 days on/ 7 days off	6	6					$2000 - $3000/mo.
Mud Engineer	1	7 days on/ 7 days off	2	1	1				$2000 - $4000/mo.
Weather Observers	1	"	2	2					N/A
SU3TOTAL FULL TIME ON DRILLING VESSEL	56		103	16	1		1*	85	
SUPPLY VESSELS									
Ranger									
Master	1	60 days on/ 40 days off	2				Company	2	N/A
hat es	2	"	3				Estimate	3	N/A
Engineers	1	"	2				5	2	N/A
Asst. Engineers	2	"	3				Jobs	2	N/A
A.B.S.	3	"	4					1	N/A

TABLE 13 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATE WITH THE OCEAN BOUNTY

	Average Persons on Board or at Work	Rotation	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
SUPPLY VESSELS (Continued)									
cook	1	60 days on/ 40 days off	2					1	N/A
Ocean Marlin									
Master	1	30 days on/ 15 days off	2					2	N/A
Mat es	2	"	3				Estimate	3	N/A
Engineers	1	"	2				2	2	N/A
Asst. Engineers	1	"	2				Jobs	2	N/A
Oiler	1	"	2					2	N/A
A.B.S.	2	"	3					1	N/A
Oral. Seamen	1	"	2					2	N/A
Cook	1	"	2					2	N/A
SUBTOTAL FULL TIME SUPPLY VESSELS	20		34				7	27	

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Out side	
PART TIME OFFSHORE									
OPERATOR									
Engineer	.13	2.0	1						N/A
SERVICE COMPANIES									
Logging	.1.6	5 days every 3 months (2.5 man months)	3		3				$21,000- $45,000/yr.
Diving/Equipment Maintenance	.13	2 days/month (2 man months)	2	2					N/A

TABLE 13 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE OCEAN BOUNTY

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Tot al Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outs i de	
SERVICE COMPANIES (Continued)									
Divers	6	Total 15-20 dives	6	6					$19.61/hr. surface $39.22/hr. diving
SUBTOTAL PART TIME ON DRILLING VESSEL	Approx. 1	12.5	12	8	3				

	Average Persons on Board or at Work	Rotation	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outs i de	
ONSHORE EMPLOYMENT									
OPERATOR									
Administration & Management	3		3		3				N/A
DRILLING CONTRACTOR - ODECO									
Administration & Management	4	14 days on/ 14 days off	4	4					N/A
Secretary	1	"	1	1					N/A
AIRCRAFT CONTRACTORS									
Helicopters									
Pilots	2		4	4					$2000 - $2500/mo. plus flight time
Mechanics	1		1			1			N/A
Secretary & Expediter	1		1	½		½			N/A
Fixed Wing									
Pilots	2	on call	2		2				$$2000- $2500/mo.

TABLE 13 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE OCEAN BOUNTY

	Average Persons on Board or at Work	Rotation	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
SUPPLY VESSEL									
Base Manager	1		1				1		N/A
SUBTOTAL ONSHORE	15		17	9½	5	1½	1		
TOTAL OFFSHORE, ONSHORE & PART TIME EMPLOYED	92		166	33.5	9	1½	9	112	
ESTIMATED TOTAL MAN MONTHS @ 15 DRILLING MONTHS	1377.5		2292.5**	502.5	135	22.5	68*	1564*	

*ODECO indicated they hired 10 to 12 Alaskans, but they did not stay. Total work time for Alaskans is estimated at 15 man months.
**Figures take into account the rotation factors for the supply vessels.

TABLE 14

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DIAMOND M DRAGON

	Average Persons on Board or at Work	Rotation	Tot al Deployment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Out side	
FULL TIME OFFSHORE									
OPERATOR - Marathon									
Drilling Foreman	1		2					2	N /A
Geologist	1		2					2	
DRILLING CONTRACTOR		28 days on/ 28 days off							The rigs are non-union and wage data was highly confidential. Wage estimates for the drilling crews are discussed in the text.
Captain	1	"	2					2	
1st Engineer	1	"	2					2	
2nd Engineer	1	"	2					2	
Able Bodied Seamen	3	"	6					6	
Rig Supervisor	1	"	2					2	
Tool Pusher	2	"	4					4	
Drillers	2	"	4					4	
Asst. Driller	2	"	4					4	
Derrick Man	2	"	4					4	
Floor Hands	8	"	16				1*	15	
Roustabouts	8	"	16					16	
Crane Operator	2	"	4					4	
Mechanic	1	"	2					2	
Electrician	1	"	2					2	
CATERING CONTRACTOR									
Universal Services	7	28 days on/ 14 days off	11					11	$3.50 to $5.50 per hour plus 1½ time over 40 hours plus $50 for complete tour

TABLE 14 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DIAMOND M DRAGON

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
USGS									
Engineer	1	7 days on/ 7 days off	2	2					GS-8 to GS-12 plus offk.here pay
SERVICE COMPANIES									
Cementing	2	21 days on/ 21 days off	4					4	ii/A
Mud Logging	4	28 days on/ 14 days off	6					6	$2000 - $3000/mo.
Mud Engineer	1	7 days on/ 7 days off	2				2		$2000 - $4000/mo.
Weather Observations	1	"	2	2					$110/day
SUBTOTAL FULL TIME ON DRILLING VESSEL	53		101	4			3	94	
SUPPLY VESSELS									
Heritage Service Master	1	30 days on/ 30 days off	2					2	Salaries range from starting salaries of $12,000 per year to an experienced master at $30,000 per year.
Mate	2	"	4					4	
Engineers	1	"	2					2	
Asst. Engineers	2	"	4					4	
A.B.S.	2	"	4					4	
Cook	1	"	2					2	
Oral. Seaman	1	"	2					2	

TABLE 14 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DIAMOND M DRAGON

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
SUPPLY VESSELS (Continued)									
Stonington		30 days on/ 30 days off							
Master	1	"	2				"Estimate	2	
Mates	2	"	4				a	4	
Engineers	1	"	2				few	2	
Oilers	2	"	4				Alaskans"	4	
A.B.S.	2	"	4				2	2	
Cook	1	"	2					2	
SUBTOTAL FULL TIME ON SUPPLY VESSELS	19		38				2	36	

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
PART TIME OFFSHORE									
OPERATOR									
Engineer	.15	2	1	1					N/A
SERVICE COMPANIES									
Well Logging	.20	2.5	3		3				$21,000 - $45,000/yr.
Diving (no information, assumed similar to DAN PRINCE & OCEAN BOUNTY)	.43(est)	6.0 (est)	6 (est)	6 (est)					$19.61/hr. surface $39.22/hr. diving
Wellhead	N/A								N/A
Casing	N/A								N/A
SUBTOTAL PARTIME ON DRILLING VESSEL	(approx.) 1**	10.5 (man months)	10	7	3				

TABLE 14 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES ASSOCIATED WITH THE DIAMOND M DRAGON

	Average Persons on Board or at Work	Rotation	Total Employment	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outside	
ONSHORE EMPLOYMENT									
Operator									
Management & Technical	5		5	5					N/A
Expediter	1		1						N/A
DRILLING CONTRACTOR									
Alaska Manager	1		1						N/A
Expediter	1		1						N/A
Secretary	1		1	1					N/A
AIRCRAFT CONTRACTOR									
Helicopter Pilots	2	7 days on/ 7 days off	4	4					Est. $2,500/mo. plus flight time
Mechanics	1		1			1			Est. $2000 - $2500/mo.
Fixed Wing Pilots	2	on call	2		2				$2000 - $2500/mo.
SUBTOTAL ONSHORE	14		**16**	**6**	**2**	**3**		**6**	
TOTAL OFFSHORE, ONSHORE & PART TIME EMPLOYED	87		**165**	17	**5**	**3**	**5**	135	
TOTAL MAN MONTHS @ 14 DRILLING MONTHS	**1212.7**		2178.7	146	**31**	**42**	70	**1890**	

* Dimond "M" Company estimated they hired 1.2 Alaskans, but they did not stay. **Total work time for Alaskans is estimated at 14 man months.**
** Approximate full time equivalent.

TABLE 15

EMPLOYMENT, RESIDENCY AND WAGES FOR ADMINISTRATIVE AND REGULATORY PERSONNEL

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Tot al Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outs i de	
ONSHORE									
Government Agencies									
BLM									
Management	.06	1.5	1	1					
Leasing Specialist	.06	1.5	1	1					
Economist	.06	1.5	1	1					
Para Legal	.06	1.5	1	1					
Statistician	.06	1.5	1	1					
USGS									
Regulation & Management	1	26	1	1					
Environmental & Technical Review	.2	5	5	5					
Geophycisist	.04	1	1	1					
EPA									
Permit Analysis & Review	.15	4	1						
Homer City Dock									
Management	.04	1	2			2			
Crane operation (loading & unloading)	.04	1	1			1			
Nikiski Dock									
Management	.33	8.5*	3		3				
Stevedore	1.15	30*	12		12				Avg. $16/hr.

TABLE 15 (Continued)

EMPLOYMENT, RESIDENCY AND WAGES FOR ADMINISTRATIVE AND REGULATORY PERSONNEL

	Average Persons on Board or at Work	Estimated Frequency (Total Man Months)	Total Employment (Including Relief Crew)	Residency					Estimated Wages
				Anchorage	Kenai	Homer	Undetermined Alaska	Outs i de	
OFFSHORE									
Survey Vessels									
Sitkin									
Crew	.31	8	8					8	
Technical	.27	7	7					7	
Administration	.08	2	2					2	
Big Valley									
Crew	.2	5	5			5			
Technical	.2	5	5					5	
Administration	.08	2	1			1			
Nightwatch & Seawife									
Crew	.15	4	4			4			
Technical	.12	3	3			1		2	
Administration	.08	2	1			1			
TOTAL PEOPLE	5**		67	13	15	15		24	
TOTAL W MONTHS		122		36.5	38.5	16		24	

*Man months based on estimate of 15% of work load attributed to Lower Cook Inlet activity.
**Approximate full timeequivalent.

All of the information in the tables was derived from interviews with the various companies involved and is therefore primary information, strictly related to this sale. However, all the data should be considered as estimates, since the study team relied on company spokesmen for most of the information and did not verify information by actually counting receipts or checking work logs. Information of that detail is beyond the scope of this report.

Background information on each topic - employment, residency and wages - are discussed below and should be read in conjunction with the tables and figures.

Employment. Data on employment were generally straightforward, with a few exceptions. The numbers and job categories of those who worked full time offshore were primarily obtained from the drilling contractors and operators. Part-time offshore employment posed a special problem, since the data are sporadic and would require a great deal of research to determine exactly, Thus, part-time employment on the rigs is not complete. However, the omissions would not amount to more than a few man months. Onshore employment related to each rig was limited to those individuals who could be determined to be working directly with each drilling vessel. There is other employment generated by the vessels not covered, such as truck drivers, local terminals, spot charters, etc.

Table 15, which estimates the administrative and regulatory employment associated with the sale, was difficult to determine precisely, because it is almost all part time. Administrative and management personnel normally have more than one area of responsibility. For example, the USGS employs thirty-five people in Alaska to enforce and

write the regulations and stipulations for all the sales held in Alaska. Only a general estimate of the amount of time and manpower spent on the Cook Inlet sale could be made (with the exception of the full time individuals working on the rigs). In addition, estimates of administrative workloads did not include personnel outside of Alaska. The table also does not take into account the numerous state, federal and local agencies that reviewed the "Notice of Support" data, lease stipulations, etc. Therefore estimates of administrative and regulatory employment are incomplete, but the information collected accounts for the majority of individuals directly involved in the Lower Cook Inlet exploration activity.

The summary statistics on employment are analyzed in Table 16 and Figure 4. A total of 545 people were estimated to be employed, for a total of 5,390 man months, in the Lower Cook Inlet exploration activity so far. The maximum number of individuals at work at any one time was 264, representing 3,191 man months of effort. Figure 4 gives an indication of how this employment was apportioned over the twenty- six month period between October 1977 and January 1980. Actual drilling took place over a nineteen month period, and peak employment lasted for about one month in August of 1979. Table 16 summarizes the total employment figures as well as the total man months of effort associated with the sale activity.

Residency. All residency data were obtained from the individual companies and operators working in the Lower Cook Inlet. In general, if the company was not Alaskan-based, only vague references to local employment were given. Alaskan-based companies, however, could usually identify where their workers resided within the state. All three

TABLE 16

SUMMARY FIGURES FOR TOTAL EMPLOYMENT AND MAN MONTHS

BY DRILLING RIG

	OCEAN BOUNTY (15 Drilling Months)		DAN PRINCE (6 Drilling Months)		DIAMOND M (14 Drilling Months)		TOTAL (35 Drilling Months)	
	At Work	Total Employed	At Work	Total Employed	At Work	Total Employed	At Work	Total Employed
Full time on drill ship:	56	103	45	82	53	101	154	286
Full time on supply boat:	20	34	20	34	19	38	59	106
Part time on drill ship:	1*	12 (12.5 man months)	1*	15 (5 man months)	1*	10 (10.5 man months)	3* (26.5 man months)	37 (26 man months)
Full time onshore:	15	17	14	16	14	16	43	49
Total people:	92	166	80	147	87	165	259	478
Total man months:	1377.5	2292.5	479	797	1212.7	2178.7	3069.2	5268.2
Administration, regulation & surveys:								
Persons:							5*	67
Man months:							122	122
TOTAL PEOPLE							264	545
TOTAL MAN MONTHS							3,191.2	5,390.2

*Estimated average full time equivalent.

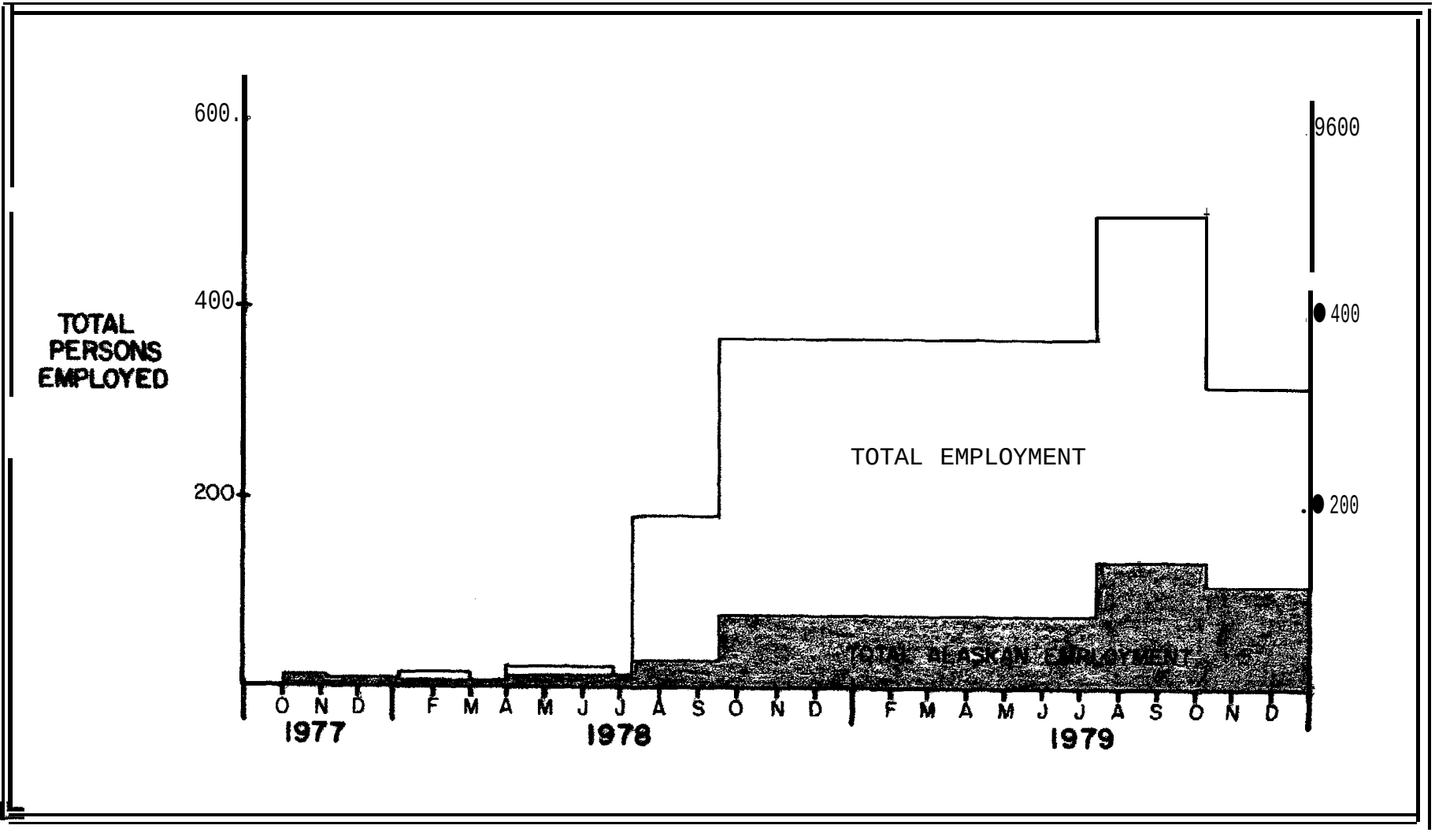


Figure 4. Total and Alaskan Employment for the Lower Cook Inlet Lease Sale C. I. (October, 1977 to January, 1980)

rig contractors indicated they had attempted to hire local workers, but they also indicated that they did not stay long - some not even for one rotation, The Diamond M Company indicated that during the time they were drilling in Alaska, they recruited 273 individuals to keep a full crew. A number of these were Alaskans. ODECO indicated they hired ten to twelve Alaskans, but they quit. Marathon indicated that some' local hires actually moved out of Alaska after beginning to work, because of cheaper living conditions outside since all transportation was paid by the companies anyway.

Based on interviews with the drilling companies, it was estimated that generally about one full-time equivalent of local workers was hired and quit over the various drilling period for each rig. Thus, one individual was placed in the tables under the "Undetermined Alaska" category, representing the number of people who worked for a short time. Reasons given for the low incidence of Alaska hires on the rigs range from an apparent lack of experienced people, to the working conditions, to the low wages. For example, the catering company stated simply that they did not pay Alaska wages, On the other hand, Offshore Logistics, who own two supply vessels, indicated that one-third of their crew (ten people) were local hires.

Individuals were defined as residents if they were living full-time in an area, whether or not they were living there before the sale. Thus, transfers, individuals staying in Alaska or individuals who moved into Alaska for the duration of the sale activity are considered residents.

Table 17 summarizes residency figures for the Lower Cook Inlet sale activities. Based on the total exploration effort of 5,390 man

TABLE 17

SUMMARY FIGURES FOR TOTAL EMPLOYMENT AND MAN MONTHS

BY LOCATION

	Anchorage	Kenai	Homer	Other	Total Alaska	Out side
OCEAN BOUNTY						
People:	33.5	9	1.5	9	53	112
Man Months:	502.5	135	22.5	68	728	1564
DAN PRINCE						
People:	27.5	18	2.5	6	54	93
Man Months:	165	23	15	36	239	558
DIAMOND M						
People:	17	5	3	5	30	135
Man Months:	146	31	42	70	289	1890
ADN1NISTRKTION REGULATIONS & SURVEYS						
People:	13	15	15		43	24
Man Months:	43.5	38.5	16		91	24
TOTAL PEOPLE:	91	47	22	20	180	364
TOTAL MAN MONTHS:	857	227.5	95.5	174	1354	4036

months, Anchorage accounted for sixteen percent, Kenai four percent, Homer two percent, Undetermined Alaska three percent, and Outside seventy-five percent of the total man months of effort. Alaska residents accounted for an estimated thirty-three percent (180 people) of the total persons employed in the Lower Cook Inlet exploration activity,

Wages. Wages are in the same category as lease costs in degree of difficulty to obtain. All wage estimates, other than published union wages, represent the best average obtainable. Wage rates vary considerably, even among individuals in the same job, Estimated wage rates were entirely unobtainable in a majority of cases. For example, wages in the drilling vessels were highly confidential. This was probably because they are all non-union vessels and the entire subject was somewhat volatile.

A portion of the drilling crew's wages could be estimated based on a percentage of Alaska wage rates for the same occupations. Marathon indicated that wage rates on the vessels for all occupations on the Diamond M Dragon ranged from forty-five to fifty-five percent less than Alaskan wage rates, not including transportation and work incentive wage allowances. Brinkerhoff Drilling Company estimated that wages for the drilling crew were approximately fifty percent of the Alaskan rate, The Alaska Roughnecks and Drillers Association estimated the wages at approximately fifty percent of the Alaskan wage rates, plus a twenty-five percent differential for Alaska. The Seafarers International Union in San Francisco indicated they had two levels of rates for their members who worked on drilling vessels, A domestic rate and an international rate, which was higher. International rates apply to Alaska. Based on this information, it is estimated

that the wages would be approximately fifty percent of the Alaskan rate, with a twenty-five percent differential for Alaskan duty, plus transportation costs. Alaskan union wages were obtained from the Alaska Roughnecks and Drillers Association. The calculated rates for the rigs are indicated below:

Driller	$11.90/hr.
Derrickman	$11.00/hr.
Floorhand	$10, 31/hr.
Roustabouts	$9. 68/hr.
Crane operator	$10, 10/hr.

Catering wages can be more directly compared. Caterer's wages ranged from a low of $3.50 per hour to a high of $5.50 per hour, plus transportations costs and a $50 bonus for completing the contract. Alaskan union wages range from $12.43 per hour for a cook to $10.95 per hour for a general helper plus $.50 per hour for health benefits and $2,00 an hour for pension benefits,

Any wage estimates that were obtained are indicated in the tables, In many cases, only a single estimate is available for similar jobs on different vessels. For example, even generalized information was only available from one out of six of the supply vessels.

Chapter 3

COMMUNITY IMPACTS

INTRODUCTION

This chapter addresses the socioeconomic characteristics and events on the Kenai Peninsula between January 1977 and January 1980, The specific data collected and analyzed in terms of OCS associated behavior, as well as the issues considered, include development projects, public service demands, price behavior, mitigating measures, labor effects, expenditures, business cycles, community attitudes and new towns, All of these categories except development projects and new towns will be discussed in detail below.

Major development projects specifically arising from the Lower Cook Inlet lease sale could not be documented. All indications were that the exploratory stage activities have not imposed sufficient pressures to lead to major expansions or development of facilities to meet increased needs. The one exception may be in Homer, where two hangars were constructed at the Homer airport. To the extent that the local governments planned and/or implemented any major infrastructure development, these will be presented in the section on mitigating measures.

With respect to the development of new towns or work camps, none arose from activities associated with the Lower Cook Inlet sale. Existing cities and infrastructures were sufficient to meet demands associated with activities for the Lower Cook Inlet sale.

One purpose of this study is to identify the effects of impacts of OCS petroleum development on the Kenai Peninsula. Because of the nature of socioeconomic activity, it should be noted that clear cause/effect relationships may not be possible to identify. The dynamics of economic activity involve expectations about the likelihood and magni-

tude of future events as well as responses learned from the past. Consequently, it is reasonable to assume that many economic adjustments to the October 1977 lower Cook Inlet lease sale were made long before the actual sale date. For this reason, timing parallels between activity levels in the data series and the lease sale may not be evident.

As the first two sections of this report have demonstrated, the direct and indirect activities associated with the exploration phase of the 1977 sale were relatively modest, peaking with three exploratory rigs working in the late summer of 1979. Employment associated with the exploratory effort was largely (seventy-five percent) nonresident. For this reason, induced economic activity would likely be minimal, By the mid- 1970's, the Census Division had grown too large for divisional statistics to reflect the level of activity occurring as a result of the 1977 sale.

METHODOLOGY

The data and information collected for this chapter were obtained using a methodology comprised of primary and secondary data sources supplemented with a verification/in terpretation process, Data sources included, but were not limited to, the Kenai Peninsula Borough; cities of Homer, Kenai, Soldotna, Seward; native organizations, various health and social service agencies; local newspapers; comprehensive plans, other planning documents and impact analyses; local government officials and businessmen.

The verification/interpretation process was a critical component of this study. Previous experience with data of these types and availability indicated that not only would numerous gaps exist in the data series themselves, but statistical analyses should be conducted in conjunction with subjective analyses to prevent misinterpretation or erroneous conclusions. For this study, the methodology for this verification/ interpretation process utilized a modified Delphi technique,

The modified Delphi technique developed for this study retains the traditional Delphi concept of reaching a concensus opinion through an iterative process of input and feedback to "experts" or knowledgeable people. The Delphi technique was originally developed as a forecasting technique which was particularly applicable where the future events of interest were not expected to occur according to a prescribed formula, e.g. , as a continuation of an historical trend or related to the foretasted values of certain exogenous variables. The modification results from the application of the method to historical events rather than future events. For this study, the Delphi approach involved the pre-

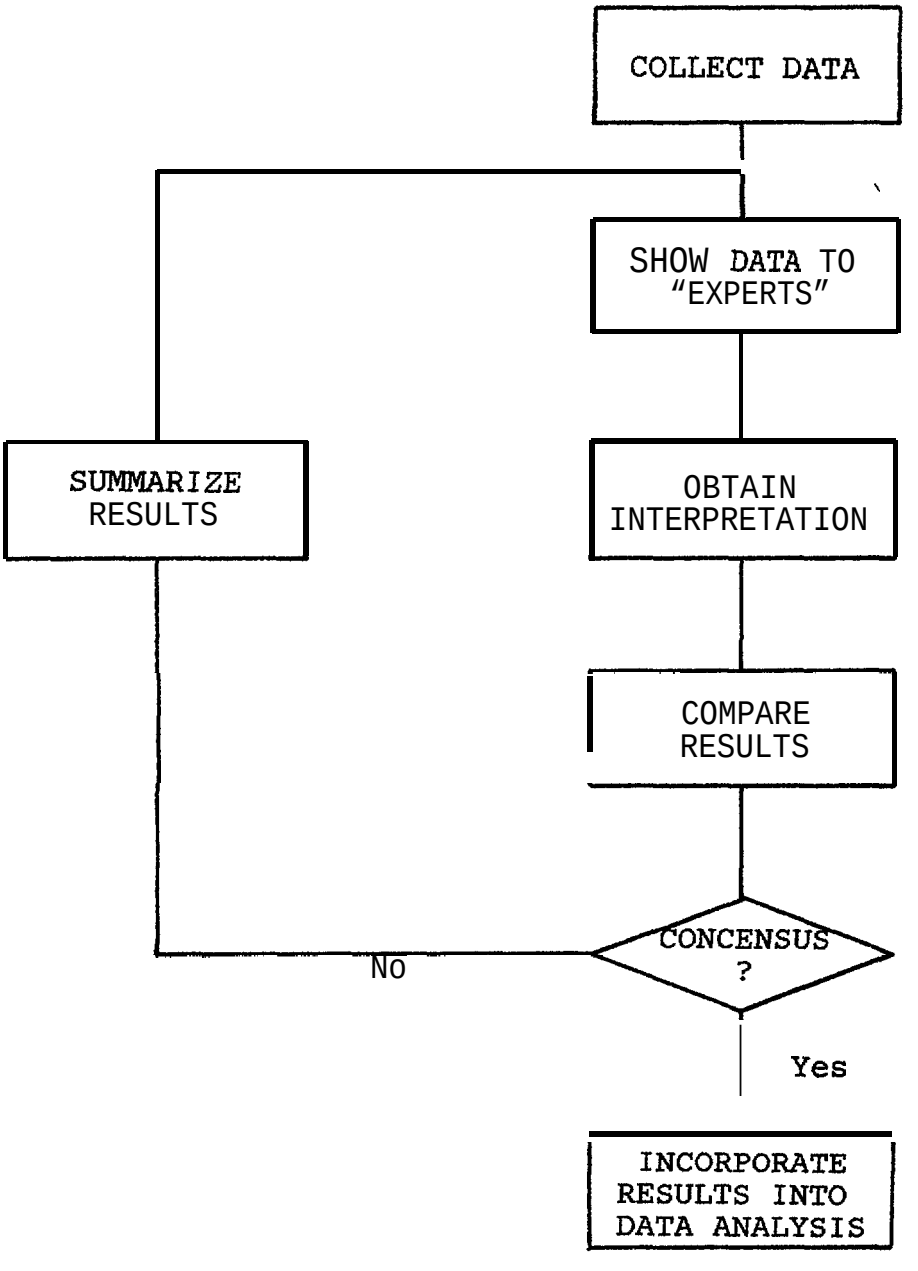
sentation of historical data series to local residents who, by virtue of their position or experience in the community, were likely to be familiar with the events occurring since 1976, Figure 5 provides a flowchart documenting the steps in this approach. Once a concensus was obtained, the information was incorporated into the analyses of the data series presented in the following sections. The Delphi technique provided a structure within which to assess and/or interpret the hard data available. The major contribution of the approach was the identification of other "local" events which could explain fluctuations or anomolies in the data series. In addition, the technique allowed us to acquire information on events or activities for which there were no hard data.

All real dollar data series presented in the text were deflated using the Anchorage Consumer Price Index (CPI). While it is recognized that there may be some error associated with using the Anchorage series as a deflator, the local economies of the two areas (Kenai Peninsula and Anchorage) are actually so interconnected that the Anchorage CPI provides a reasonable indicator of the rate of price changes on the peninsula. In fact, the commodity component of the Anchorage CPI should move in a manner parallel to the behavior of commodity prices on the peninsula, since virtually all of these items are shipped first to Anchorage for subsequent transport to the peninsula (i. e., the same commodities contributing to the Anchorage CPI become Kenai Peninsula commodities),

For the purpose of this study, the terms "boom" and "bust" have been defined as follows: a boom represents a departure from the long run trend, in the direction of a more rapid rate of growth than histor-

Figure 5

MODIFIED DELPHI TECHNIQUE



ically experienced; a bust represents a departure in the direction of a slower growth than normal.

Data series are presented for the five major (first class) cities on the Kenai Peninsula. Not all series were available for Seldovia, however. Information and data on English Bay and Port Graham were seriously lacking. Any available information is contained in the text.

PUBLIC SERVICE DEMANDS

This section will address the demands for public services in the Kenai Peninsula Borough during the time period associated with the Lower Cook Inlet lease sale (i. e., January 1977-January 1980). Since the demand for public services is closely tied to the population and income of an area, a discussion of the population growth for the peninsula as a whole, as well as for specific cities on the peninsula, will provide a basis for the evaluation of specific demands for services. Table 18 shows the borough population from 1960 through 1979. Estimates of the 1980 population will not be available until late 1980. Population growth on the peninsula since 1960 has been dramatic, increasing almost 182 percent. The greatest increase occurred between 1960 and 1970, when the population grew by eighty-three percent. Between 1970 and 1979, growth has been fifty-four percent, with most of this occurring between 1970 and 1977 (over forty-eight percent). Since 1977, population on the peninsula has increased less than four percent.

Annual population changes provide an indication of the “boom” and “bust” effects of oil-related activities. The long-run trend in population growth for the Kenai Peninsula can be estimated from the compound average annual growth rate. Between 1960 and 1979, this rate was 5.6 percent. Individual growth rates for each year over the previous year are also shown in Table 18. Analysis of the annual changes in peninsula population indicates that an apparent "boom" occurred between 1974 and 1977 and that the borough is currently experiencing a “bust” period. This decline in the growth of the demographic component of the

Table 18

KENAI PENINSULA BOROUGH
TOTAL POPULATION

Year	Population	
1960[1]	9,053	
1970[1]	16,586	
1971[2]	16,782	1.0%
1972[2]	16,200	-4.0%
1973[2]	16,254	.3%
1974[2]	16,645	2.0%
1975[2]	18,770	13.0%
1976[2]	21,843	16.0%
1977[3]	24,611	13.0%
1978[1]	25,335	3.0%
1979[4]	25,507	.7%

Source: [1]U.S. Bureau of the Census.
[2]Alaska Department of Labor.
[3]Anchorage Urban Observatory.
[4]Kenai Peninsula Borough.

demand for public services provides a basis for expecting a leveling-off in the actual demand for these services.

It should be noted, however, that these population figures are estimates (except 1960, 1970 and 1978) and, depending on the source, utilize different estimating methodologies. Consequently, it is reasonable to assume that the series may be inconsistent. The editor of the Peninsula Clarion expressed particular concern over the borough figures for 1973 through 1975. Newspaper circulation statistics for that period would seem to indicate larger populations than reflected in the estimates for these years. To the extent that this is valid, it may mean that growth was more consistent than the population figures (and accompanying growth rates) indicate.

Historical population series for five cities on the Kenai Peninsula are shown in Table 19. The estimates given in this table represent the annual estimates submitted by each city for state revenue sharing purposes. In 1978, a special census was conducted by the U.S. Census Bureau. The apparent discontinuities in the historical series occurring in either 1978 or 1979 represent the utilization of these U.S. census figures. It is likely that some of the decreases in population occurring in 1978 or 1979 reflect the adjustment from overestimation in previous years. Consequently, only population changes between 1970 and 1979 will be evaluated.

Homer population increased 106 percent between 1970 and 1979, the largest change of all the cities. Soldotna also showed a large increase, with a ninety-seven percent change. Kenai, Seward and Seldovia registered more modest rates of change for the nine year period, increasing twenty-five percent, twelve percent and twenty percent, re-

Table 19

POPULATION

Kenai Peninsula Cities

Year	Homer	Kenai	Soldotna	Seward	Seldovia
7/1/70	1,083	3,533	1,202	1,587	437
7/1/71	1,083	3,533	1,202	1,823	437
7/1/72	1,243	3,560	1,202	1,823	437
7/1/73	1,243	3,533	1,202	1,823	437
7/1/74	1,243	4,028	1,202	1,823	612
7/1/75	1,538	5,161	1,800	1,823	612
7/1/76	1,538	5,223	1,800	1,823	612
7/1/77	1,802	5,364	2,586	2,279	612
7/1/78	2,055	5,364	2,365	2,137	612
7/1/79	2,227	4,421	2,365	1,778	528

Source: Alaska Department of Community and Regional Affairs, Division of Local Government Assistance.

spectively. It is difficult to assess the demographic impacts of the demand for public services in these individual cities because of the variation in population estimates during the years 1977 through 1979. Since it is not possible to state definitely that population actually decreased in any of these cities, it would be inappropriate to suggest demographic implications for public service demands.

Income statistics may also provide further information regarding the level of public services demanded. Table 20 provides data on the per capita income for the Kenai-Cook Inlet and Seward divisions. Data for 1979 are unavailable at this time.

Nominal per capita income for the Kenai-Cook Inlet division increased thirteen percent between 1975 and 1978. However, a six percent decrease in per capita income occurred from 1977 to 1978. In real terms, per capita income exhibited decreases from 1975 to 1978 as well as between 1977 and 1978 (down nine percent and twelve percent respectively).

The Seward division exhibited a similar pattern, though the magnitude of the declines was less pronounced. Between 1975 and 1978, nominal per capita income grew by twenty-one percent. A decrease of one percent occurred between 1977 and 1978. Real per capita income for the Seward division fell by two percent from 1975 to 1978, and by eight percent between 1977 and 1978.

The possible implications that these income figures have for the demand for public services lies in the assumption that the consumption of most commodities varies according to the level of per capita or family income. To the extent that this is valid, it could be expected that a decline in per capita income may indicate that per capita or family de-

Table 20

PER CAPITA INCOME

Current Dollars

Year	Kenai-Cook Inlet Division	Seward Division
1975	8,354	7,854
1976	8,805	9,030
1977	10,007	9,630
1978	9,408	9,517

1967 Dollars

Year	Kenai-Cook Inlet Division	Seward Division
1975	5,532	5,201
1976	5,392	5,530
1977	5,745	5,528
1978	5,050	5,108

mand for some services, such as utility usage, may decline. On the other hand, a declining per capita income may result in an increase in the demand for other types of service, for example transfer payments (i. e, , unemployment compensation, food stamp recipients, welfare payments). The following sections identify and analyze data series for various public services. Because lower Cook Inlet exploratory activity was proximate to Homer, and since Homer's inf restructure (particularly transportation facilities) was relatively well developed, the Homer area became the focus of much exploration activity. It is undoubtedly true that data series specific to Homer that include the peak exploratory year of 1979 reflect the influence of exploration activity.

Police Services. Traffic volumes provide a indication of the level of public service demands, especially highway requirements. In particular, the level of traffic activity has a direct relationship to the need for police and state trooper services. Tables 21 through 25 provide annual average daily traffic volumes for selected roads and intersections throughout the Kenai Peninsula. The greatest increase in the level of traffic between 1973 and 1978, according to these data, occurred on Nash Road in Seward (163 percent), A large increase in traffic volume also occurred on the Kenai Spur Road at the Sterling Highway (135 percent), while traffic levels on the Sterling Highway at the Kenai Spur Road actually registered a decrease of fifty-six percent over this same time period.

Homer traffic showed increases, with levels on the Sterling Highway at East End Road growing by fifty-three percent. Smaller increases in traffic levels occurred at other points in Kenai, Homer, Soldotna and Seward. The Kenai Spur Road, at the intersection with

Table 21

TRAFFIC VOLUMES
Annual Average Daily Traffic (AADT)
Kenai, Alaska

Year	Kenai Spur @ Sterling Hwy (State #117600)	Kenai Spur @ Nikiska Road (State #117600)
1973	2,995	2,025
1974	5,230	2,100
1975	6,400	3,360
1976	8,000	2,945
1977	7,543	2,690
1978	7,100	2,424
1979		

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Table 22

TRAFFIC VOLUMES
Annual Average Daily Traffic (AADT)
Soldotna, Alaska

Year	Funny River Rd @ Sterling Hwy (State //117300)	Soldotna Wye, Sterling Hwy @ Kenai Spur (State /}117700)
1973	N/A	2,545
1974	1,180	700
1975	730	855
1976	915	1,070
1977	625	1,125
1978	989	1,125
1979		

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Table 23

TRAFFIC VOLUMES
Annual Average Daily Traffic (AADT)
Homer, Alaska

Year	Sterling Hwy @ East End Road (State #110000)	Sterling Hwy @ Diamond Ridge (State #110000)
1973	2,320	N/A
1974	3,030	1,100
1975	3,260	1,185
1976	3,550	1,290
1977	3,548	1,300
1978	3,550	1,300
1979		

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Table 24

TRAFFIC VOLUMES
Annual Average Daily Traffic (AADT)
Seward, Alaska

Year	Dock Road (State //130200)	Nash Road (State #130500)	Seward Hwy @ Dock Road (State /}130000)
1970	580	170	1,835
1971	610	190	1,830
1972	64o	200	1,850
1973	650	205	2,305
1974	725	230	2,575
1975	760	245	2,700
1976	1,300	415	3,040
1977	1,400	535	2,500
1978	1,415	540	2,478
1979			

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Table 25

TRAFFIC VOLUMES
Annual Average Daily Traffic (AADT)
Seldovia, Alaska

Year	Seldovia Airport Road @ Ferry Terminal (State /}100100)
1973	N/A
1974	20
1975	20
1976	20
1977	30
1978	30
1979	

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Nikiska Road, showed a twenty percent increase between 1973 and 1978. Peak traffic levels at this location occurred in 1975, with an annual average daily count of 3,360. The count in 1978 was 2,424, a drop of twenty-eight percent.

Other major traffic count locations on the peninsula are shown in Table 26. Data for these sites were available from 1970 through 1979. The checkpoint at Potter showed the largest increase for these years (seventy-five percent), with Silver Tip close behind at sixty-five percent. Traffic at Moose Pass only grew by thirty-two percent, Traffic levels at Silver Tip and Potter each peaked in 1978, with counts of 1,719 and 3,505, respectively. Moose Pass traffic volume peaked in 1977 at 808.

Traffic statistics for the Kenai Peninsula, representing activity by the Alaska State Troopers, are shown in Table 27. Data are not yet available for the period after September 1979. Overall activity is revealed by the total number of citations issued. There was an increase of 108 percent in the number of citations issued in 1976 over 1975; citations issued in 1977 represented an increase of 128 percent over 1976. In 1978, total citations issued dropped by three percent. If the citation data for the first nine months of 1979 is representative of three-fourths of the total 1979 activity, then 1979 citations will reflect a level of activity comparable to 1978. Between 1975 and 1976, there was a thirty-one percent decrease in the number of traffic accidents. An increase of forty percent occurred in 1977, but the number of accidents decreased again in 1978 by fifteen percent. If the pattern of the first nine months of 1979 continues, it is likely that total accidents in 1979 will be lower than in 1978. A comparison of the number of injury acci-

Table 26

HISTORICAL TRAFFIC SUMMARY
Annual Average Daily Traffic (AADT)

Year	Moose Pass F-3-31	Silver Tip F-2-31	Potter F-4-31	Soldotna F-l-21
1970	550	924	1,929	
1971	548	977	1,954	
1972	554	1,088	2,240	
1973	552	1,222	2,493	
1974	613	1,422	2,665	
1975	693	1,594	2,985	
1976	770	1,552	3,118	2,155
1977	808	1,453	3,469	2,519
1978	768	1,719	3,505	2,519
1979	723	1,523	3,370	2,468

Source: Annual Traffic Volume Report (1970-1979), Alaska Department of Transportation.

Table 27

TRAFFIC STATISTICS
Kenai Peninsula

Year	Motor Vehicle Accidents			Total Citations
	Injury Accidents	Fatal Accidents	Total Accidents	
1975	160	13	423	1,291
1976	158	8	293	2,683
1977	227	8	410	6,116
1978	143	13	348	5,945
1979 - Jan.	5	0	30	245
Feb.	9	0	23	238
Mar.	8	0	18	443
Apr.	2	1	18	768
May	10	1	34	802
Jun.	11	1	18	701
Jul.	17	1	32	301
Aug.	8	1	29	390
Sep.	7	1	20	557
1979 - 1st 9 mos.	77	6	222	4,445

Source: Alaska State Troopers.

dents to total accidents reveals that the proportion of injury to total accidents increased each year through 1977, when it peaked at fifty-five percent. In 1978, the ratio fell to forty-one percent. For the first nine months of 1979, this ratio is only thirty-five percent.

Other police activity on the peninsula is shown in Tables 28 and 29. In Kenai, police calls in response to crime (burglary and larceny) increased each year since 1976. Traffic citations increased eighty-one percent between 1976 and 1979. The impact on traffic accidents can be estimated from the forty-four percent increase in total accidents investigated between 1976 and 1979; a twenty percent drop in traffic accidents occurred between 1978 and 1979.

Burglary and larceny in Seward increased seventeen percent in 1978 over 1977, but 1979 police calls for these crimes decreased twenty percent, bringing the total below that for 1976. Total arrests have declined significantly since 1976.

Total police calls in Homer (Table 29) increased sixty-two percent in 1977. In 1978, total calls fell by three percent and by 1979 total calls were down another thirteen percent. Traffic citations issued each year have increased, with 1979 representing a 140 percent increase over 1976.

Police calls related to property crimes in both Soldotna and Seldovia dropped between 1978 and 1979. Violent crime increased 117 percent in Soldotna for 1979. Seldovia reported no violent crime either year.

Part 1 offenses[4] reported for each city are shown in Table 30. Between 1977 and 1979, Part 1 offenses in Kenai increased thirty-two

[4]Part 1 crime offences include rape, robbery, assaults, burglary, larceny and auto theft.

Table 28

POLICE CALLS

Kenai Police Department

Yea r	Crime[1]	Traffic Citations	Traffic Arrests	Traffic Accidents Investigated
1976	243	754	101	117
1977	307	88(I	109	148
1978	335	1,191	90	211
1979	409	1,366	120	169

Seward Police Department

Year	Crime[1]	Traffic Citations	Total Arrests	Traffic Accidents Investigated
1976	232	1,151	410	50
1977	243	791	511	21
1978	285	421	349	73
1979	227	395	195	81

[1]Burglary and larceny only.

Source: City Police Departments.

Table 29

POLICE ACTIVITY

Homer Police Department
Police Calls

Year	Total Calls	Traffic Citations
1976	1,791	55
1977	2,898	111
1978	2,798	111
1979	2,421	132

Soldotna Police Department
Police Calls

Year	Property Crime	Violent Crime
1978	174	6
1979	152	13

Seldovia Police Department
Police Calls

Year	Property Crime	Violent Crime
1978	129	0
1979	14	0

Sources: Homer Police Department.

Situation and Prospects, January, 1980. Kenai Peninsula Borough.

Table 30

CRIME REPORT

Kenai

	Total Reported Part 1 Offenses	Total Arrests (Part 1 & 2)	
		18 yrs. and over	under 18
1977	375	285	64
1978	408	180	77
1979	494	215	144

Homer

	Total Reported Part 1 Offenses	Total Arrests (Part 1 & 2)	
		18 yrs. and over	under 18
1977	242	91	5
1978	267	122	21
1979	273	84	20

Soldotna

	Total Reported Part 1 Offenses	Total Arrests (Part 1 & 2)	
		18 yrs. and over	under 18
1977	97[1]	32	18
1978	182	65	16
1979	156	201	19

Seward

	Total Reported Part 1 Offenses	Total Arrests (Part 1 & 2)	
		18 yrs. and over	under 18
1977	N/A	N/A	N/A
1978	51[2]	253	2[3]
1979	104	189	46

[1]Ten months reported only.

'September through December only.

[3]December only.

Source: Criminal Justice Planning Agency.

percent. Homer reported a thirteen percent increase for the same years. Data are incomplete for Soldotna for 1977; however, there was a fourteen percent decrease in Part 1 offenses between 1978 and 1979. Incomplete data for Seward prevents any analysis of change for this city.

Fire Protection and Emergency Medical Treatment. The demands for emergency medical treatment and fire responses are shown in Table 31. Demand for emergency medical treatment in Homer increased sixty-two percent between 1977 and 1979. Soldotna showed a six percent increase in 1979 over 1977. Emergency medical treatment responses increased sixteen percent in Kenai from 1977 to 1978 and decreased nineteen percent between 1978 and 1979, The overall change from 1977 to 1979 was a decrease of six percent. Data for Seward are incomplete and prevent a comparable analysis.

Fire responses showed increases for both Kenai and Soldotna between 1977 and 1979 (twenty-one percent and 130 percent, respectively), No 1977 data were available for Seward; however, demand remained constant between 1978 and 1979, Homer data represent incomplete annual totals; therefore, no comparisons are made.

Medical Service Demands. Table 32 provides data on the total number of patients (regular admissions and out-patient/emergency services) for the hospitals on the Kenai Peninsula. Central Peninsula General Hospital showed a fifteen percent increase in the total number of patients between 1977 and 1979. South Peninsula General Hospital experienced an even greater increase, thirty-seven percent, for the same time period. Data for 1977 at Seward General Hospital were unavailable; however, there was a three percent increase in total patients

Table 31

FIRE AND EMERGENCY SERVICES

Emergency Medical Treatment Responses

Year	Homer	Kenai	Soldotna	Seward
1977	125	162	174	N/A
1978	192	188	117	281
1979	202	152	184	46[2]

Fire Responses

Year	Homer	Kenai	Soldotna	Seward
1977	36[1]	72	20	N/A
1978	421	98	35	21
1979	62[2]	87	46	21

[1]September through December only.

[2]January through June only.

Sources: City and Service Area Fire Departments

Situation and Prospects, January, 1980. Kenai Peninsula Borough.

Table 32

KENAI PENINSULA HOSPITALS
Number of Patients

Year	Central Peninsula General Hospital[1]	South Peninsula General Hospital[1,2]	Seward General Hospital	Wesleyan Nursing Home[3]
1977	8,110	1,441	N/A	64
1978	9,104	1,968	5,256	62
1979	9,304	1,973	5,437	54

[1]Regular admissions plus outpatients.

[2]Fiscal year patient counts for twelve months ending June 30 of stated year.

[3]Average monthly patients.

Sources: Central Peninsula General Hospital (Soldotna).
South Peninsula General Hospital (Homer).
Situation and Prospects, January, 1980, Kenai Peninsula Borough.
Wesleyan Nursing Home (Seward).

between 1978 and 1979. The Wesleyan Nursing Home in Seward experienced a net decrease of sixteen percent from 1977 to 1979.

Demand for mental health services varied among the three peninsula clinics (Table 33). The Kenai clinic experienced strong increases in caseloads, which coincide with the addition of staff at that facility. Average monthly caseload increased fifty-five percent between 1977 and 1978 and another ten percent from 1978 to 1979. Seward Mental Health Clinic showed a twenty-eight percent decrease in average monthly cases and Homer's average caseload declined only two percent.

Educational Demands. Kenai Peninsula Borough school enrollments between September 177 and January 1980 are given in Table 34. These data represent monthly enrollment figures for each school for selected months. Total enrollment between September 1977 and September 1979 increased from 5,724 to 5,928, a four percent increase. However, fifteen of the borough's twenty-four public schools showed lower September 1979 enrollment figures than for September 1977.

Kenai schools showed a slight decline (five percent) in enrollments from September 1977 to September 1978, but an increase of seven percent between September 1978 and September 1979. This would appear to be inconsistent with the population changes occurring in Kenai (i.e., out-migration). In fact, the increasing enrollment numbers probably have resulted from the institution of new graduation requirements. As a result of these new criteria, some students are having to remain in school additional semester(s) in order to meet graduation requirements.

Enrollment in Kenai schools fell each year between September and January, though at a decreasing rate. While mid-year enrollment declined four percent in 1978, it fell only .2 percent in 1980. This same

Table 33

KENAI PENINSULA MENTAL HEALTH CLINICS
AVERAGE MONTHLY CASELOAD

Year	Kenai	Seward	Homer
1977	95	N/A	N/A
1978	147	69	57
1979	164	50	56

Sources: Situation and Prospects, Kenai Peninsula Borough, January 1980.
District Mental Health Offices in Kenai.

Table 34

KENAI PENINSULA BOROUGH SCHOOL DISTRICT
ENROLLMENT FIGURES

School	Sept./77	Jan. /78	May/78	Sept./78	Jan./79	May/79	Sept./79	Jan./80
Anchor Point Elem.	87	92	93	93	95	92	115	126
Bartlett Elem./High	111	96	98	103	95	87	93	88
Cooper Landing Elem.	24	26	25	26	27	26	18	17
East Homer Elem.	346	334	353	367	358	367	372	367
English Bay Elem./High	29	33	31	35	35	34	39	34
Homer Jr./Sr. High	416	404	393	404	393	403	443	429
Hope Elem.	10	8	10	10	10	9	10	15
Kenai Central High	749	697	640	775	756	715	879	854
Kenai Elem.	277	270	271	263	265	270	265	284
Kenai Jr. High	512	511	510	492	495	490	495	497
Moose Pass Elem.	44	42	44	40	40	39	31	28
Nikolaevsk Elem./Jr.	126	151	145	148	155	149	144	160
Ninilchik Elem./High	154	160	166	165	167	166	134	113
North Kenai Elem.	396	392	400	407	414	410	392	395
Port Graham Elem./High	42	44	46	39	42	43	39	38
Redoubt Elem.	--	--	--	--	--	--	366	380
Sears Elem.	414	407	405	383	391	393	397	395
Seward Elem.	302	302	301	282	280	290	279	273
Seward High	183	167	147	167	159	160	172	170
Soldotna Elem.	672	691	696	693	684	676	432	431
Soldotna Jr. High	322	328	337	441	449	452	342	349
Sterling Elem.	219	214	214	191	187	191	211	205
Susan B. English Elem./High	158	150	145	135	125	121	135	137
Tustumena Elem.	131	138	135	136	136	135	125	129
Total	5,724	5,667"	5,605	5,795	5,758	5,718	5,928	5,914

Source: Kenai Peninsula Borough School District.

pattern occurred for peninsula schools as a whole: enrollments have increased from September to September and decreased from September to January (at a decreasing rate). Between 1977 and 1978, total enrollment in Kenai Peninsula Borough schools increased by the same rate as total peninsula population (four percent). Average monthly enrollment statistics are shown in Table 35.

Utility Connections. Table 36 provides data on demand for electricity for the Kenai Peninsula. The average monthly consumers of electricity from Homer Electric Association showed significant increases for all classifications except public buildings. The average monthly residential consumers increased 218 percent between 1970 and 1979. Most of this growth in customers occurred between 1970 and 1977, when average monthly consumers increased 105 percent. Between 1977 and 1979, an additional increase of fifty-six percent occurred. Electric connections for small commercial consumers followed the pattern observed for residential consumers: average monthly consumers (small commercial) grew 182 percent from 1970 to 1979, with most of this growth occurring after 1977 (104 percent). Between 1970 and 1977, the increase was seventy-eight percent. The Homer Electric Association serves Kenai and Soldotna as well as Homer. Table 19 revealed that Kenai and Soldotna had relatively stable or declining populations after 1978. Therefore, some of the increase in the number of electrical connections in 1979 must be attributed to Homer. This is also the year of peak exploration activity. The coincidence suggests the possibility of some sale-related impact.

Large commercial consumer activity exhibited a different pattern from residential and small commercial consumers. From 1970 to 1977,

Table 35

KENAI PENINSULA BOROUGH SCHOOL DISTRICT
Average Monthly Enrollment

School	School Year 77-78	School Year 78-79	School Year† 79-80
Anchor Point Elem.	91	93	119
Bartlett Elem./High	95	94	89
Cooper Landing Elem.	27	26	18
East Homer Elem.	345	362	368
English Bay Elem./High	31	34	36
Homer Jr./Sr. High	405	410	436
Hope Elem.	9	10	13
Kenai Central High	703	760	838
Kenai Elem.	273	263	272
Kenai Jr. High	510	491	494
Moose Pass Elem.	43	41	28
Nikolaevsk Elem./Jr.	139	147	151
Ninilchik Elem./High	159	166	136
North Kenai Elem.	390	393	388
Port Graham Elem./High	44	42	40
Redoubt Elem.			370
Sears Elem.	407	392	394
Seward Elem.	298	282	275
Seward High	164	162	167
Soldotna Elem.	682	685	429
Soldotna Jr. High	324	447	344
Sterling Elem.	214	188	204
Susan B. English Elem./High	149	126	130
Tustumena Elem.	134	134	126

†Average monthly enrollment based on August, 1979 through January 1980 data only.

Source: Kenai Peninsula Borough School District.

Table 36

ELECTRICAL CONNECTIONS

HOMER ELECTRIC ASSOCIATION, INC.†
Average Monthly Consumers

Year	Residential	Small Commercial	Large Commercial	Public Buildings
1970	2,706	508	38	77
1971	2,732	530	38	80
1972	2,857	549	39	82
1973	3,060	563	33	92
1974	3,373	619	33	93
1975	3,813	690	33	91
1976	4,526	808	31	83
1977	5,541	905	32	85
1978	7,899	1,287	95	40
1979	8,617	1,433	101	38

SEWARD ELECTRIC UTILITY††
Average Monthly Consumers

Year	Residential	Non-Residential
1976	884	218
1977	945	232
1978	1,025	273
1979	1,055	271

†Service area extends from Sterling to Nikiski to English Bay.
††Service area extends outside city to Kenai Lake vicinity.
Source: Situation and Prospects, January, 1980. Kenai Peninsula Borough.

large commercial consumers fell by sixteen percent, from thirty-eight users to thirty-two users. Significant increases occurred during 1978 and 1979, resulting in a net gain of sixty-nine consumers, an increase of 216 percent, Demand for electricity for public buildings also fluctuated, resulting in a fifty-one percent decrease in average monthly consumers between 1970 and 1979. A ten percent increase occurred between 1970 and 1977, but this was more than offset by the fifty-five percent decrease between 1977 and 1979.

Residential consumers for the Seward Electric Utility increased nineteen percent from 1976 to 1979. This was a much more modest increase than that exhibited by the Homer Electric Association for the same time period (ninety percent). Over eleven percent of the growth in residential consumers in Seward occurred between 1977 and 1979, although there was only a three percent increase in 1979 over 1978. Non-residential consumer activity increased similarly, growing twenty-four percent between 1976 and 1979 and seventeen percent from 1977 to 1979. However, non-residential consumer counts dropped seven percent between 1978 and 1979.

Average number of mainstations provides an indication of the total customers of a telephone utility, Table 37 gives mainstation data for Glacier State Telephone Company, which serves most of the peninsula, and General Telephone Company, which serves the Seward area. Average mainstations at Glacier State Telephone Company increased thirty-five percent between 1977 and 1979. This increase, however, did not reflect a growing demand for telephone service during this time period. Instead, the greater number of mainstations indicates the increase in plant, equipment and facilities which permitted more of the

Table 37

TELEPHONE MAINSTATIONS

GLACIER STATE TELEPHONE COMPANY
Average Monthly Number of Mainstations

Year	Average Number of Mainstations
1977	5,118
1978	5,824
1979	6,888

Source: Glacier State Telephone Co.

GENERAL TELEPHONE COMPANY
Average Monthly Number of Mainstations

Year	Average Number of Mainstations
1977	N/A
1978	1,519[1]
1979	1,539

[1]Based on two months of data only.
Source: General Telephone co.

unmet demand to be met. Waiting lists for telephone service decreased significantly over the same time period, suggesting that total demand did not increase between 1977 and 1979.

Data for General Telephone Company in Seward were limited and incomplete. No analysis was conducted on these data.

Connections for water and sewer service for the various cities on the peninsula are shown in Table 38. Homer sewer connection increases closely followed increases in water connections, seventy-three percent compared with seventy percent, respectively, between 1976 and 1979. Growth for both types of service was reasonably constant over the years and primarily reflected the expansion of the water and sewer service areas. The cost for water to residents did not rise during this period and Homer was able to supply water to the vessels without any rationing or other use curtailments for its users. The situation did prompt the city to initiate construction of a large water storage tank on the spit for future users.

Water and sewer connections in Kenai reflect a similar pattern; the average number of connections increased forty-five percent for sewer service and forty-five percent for water service. Increases were evenly spread over the four-year period and reflect, primarily, service area expansions. Soldotna, Seward and Seldovia showed only modest increases in water or sewer connections between 1978 and 1979. Water in Kenai was sold from a private source and therefore, except for overall groundwater availability in the area (which is a problem), did not affect residential or industrial users.

Table 38

SEWER
AVERAGE MONTHLY CONNECTIONS
(Residential and Non-Residential)

Year	Homer	Kenai	Soldotna	Seldovia
1976	232	475		
1977	279	549		
1978	341	622	2791	144
1979	401	687	288	174

WATER
AVERAGE MONTHLY CONNECTIONS
(Residential and Non-Residential)

Year	Homer	Kenai	Soldotna	Seward	Seldovia
1976	307	506		603	
1977	379	578		6i5[2]	
1978	453	656	2451	632[3]	209
1979	521	731	258	642	205

[1]Based on September through December data only.

[2]Missing November.
[3]Missing August.

Source: City offices - Homer, Kenai, Soldotna, Seward, Seldovia.

Airport Activity. Take-off and landing data for the Kenai Municipal Airport are given in Table 39. These data provide breakdowns of itinerant and local airport traffic from 1975 through February 1980. Air taxi traffic showed the greatest change between 1975 and 1979, with an increase of 184 percent. Most of this occurred from 1975 to 1977. There was only a twenty-six percent increase after 1977. All other categories showed smaller increases from 1975 to 1979, with peaks occurring either in 1977 or 1978. General aviation grew only seven percent for the whole time period, with a two percent drop after 1977. Itinerant military traffic increased thirtyfive percent overall and fell twenty-one percent after 1977. Local civilian traffic showed the largest overall growth (after air taxi) since 1975; however, the 1979 traffic level was thirty-four percent lower than 1977.

Only Wein Air Alaska data are provided for the Homer Airport. These data are shown in Table 40. Passenger activity has fluctuated since 1971, reaching a peak of 6,170 in 1972 and a low of 1,221 in 1974. Passenger traffic has increased steadily since 1974, growing over 128 percent. Freight levels also peaked in 1972 and have fluctuated each year since then. The 1979 level of freight represented a sixty-eight percent decrease over the 1971 level. Total landings were highest in 1971, reached a low in 1977 and remained constant (203 landings) for 1978 and 1979. As indicated in the previous chapter, oil company personnel were transported to Homer by Kenai-based charter aircraft and on Wein Air Alaska. However, the demand on the commercial airlines was not sufficient to increase the number of flights.

Port Use. As indicated in the previous section on petroleum activity (Table 10), the Homer dock and the Nikiski dock were used as

Table 39

KENAI MUNICIPAL AIRPORT
TAKE-OFFS AND LANDINGS
Annual Totals

	Itinerant				Local		
Year	Air Carrier	Air Taxi	General Aviation	Military	Civilian	Military	Total
1975	4	10,306	30,420	580	10,070	1,608	52,988
1976	8	16,882	39,293	592	19,278	2,491	78,544
1977	65	23,208	40,459	995	22,745	2,412	89,965
1978	73	23,511	40,636	674	20,132	2,390	87,425
1979	275	29,309	32,466	783	14,992	792	78,617
1/80	24	1,897	1,172	63	606	92	3,854
2/80	12	2,157	1,408	71	1,214	116	4,978

Source: City of Kenai.

Table 40

HOMER AIRPORT
(Wein Air Alaska)

Year	Landings	Number of Passengers	Freight (tons)	Mail (tons)	Total Freight and Mail
1971	1,061	5,078	74.62	11.70	86.32
1972	869	6,170	121.69	16.63	138.32
1973	449	3,098	52.46	14.91	67.37
1974	187	1,221	34.64	.72	35.36
1975	219	1,321	59.53	1.52	61.05
1976	197	1,409	26.58	8.18	34.76
1977	174	1,530	31.93	8.10	40.03
1978	203	2,120	16.41	3.54	19.95
1979	203	2,785	23.84	.19	24.03

Sources: Airport Activity Statistics of Certified Route Air Carriers. Civil Aeronautics Board and Federal Aviation Administration.

Wein Air Alaska.

the primary points of supply for the drill rigs. The Nikiski dock is privately owned and was built to service the petroleum industry. The additional load impoased by activities in lower Cook Inlet did not present any problems. In fact, the business was welcomed because upper Cook Inlet activity has diminished over the past few years. Most of the supplies for the rigs passed through this dock as the revenue figures in Figure 10 indicate. The primary use of the Homer dock was for replenishing supplies of fresh water. Statistics indicate that dockings averaged 26.6 visits per month over a period of fourteen months. This is a little less than one visit per day. The dock can accommodate two to three vessels at a time, and dock stays by the vessels were minimized since they primarily obtained only water. Thus, according to the Homer City Dock manager, the facilities were never strained, even during the busiest times. In addition, the boats required very little labor for only a short time (mainly to connect water to the vessels), so no extra men were required to service the vessels.

PRICE BEHAVIOR

Where a project has a significant short-run economic impact on a local or regional economy, one manifestation of this impact is on the price of goods and services, including labor services. Because all goods and services are not perfectly mobile at nonsignificant transportation costs, it is likely that some local/regional prices will reflect this relative immobility and increase more rapidly than prices in general.

For example, the Trans-Alaska Pipeline project (TAP's) significantly affected the rate of inflation in Southcentral Alaska and, more specifically, in Anchorage. Table 41 compares the Anchorage and U.S. CPI's for the years 1974 to 1980, Prior to 1974, Anchorage prices had been increasing at a slower rate than overall U.S. prices. This fact is evidenced by a CPI value 11,2 percent lower than that for the U.S. But, by 1974, the Anchorage CPI was increasing at a rate 17.9 percent in excess of the U.S rate. In 1975, the difference is 63.2 percent and 1976 28,8 percent, so that by January of 1977 there is only a 3.5 percent difference between the two indexes.

Since 1977, the rate of inflation has generally been lower in Anchorage than for the U.S in general. This lower rate indicates both the supply side response to TAP's and the post-TAP's recession. Anchorage is essentially an open economy with respect to the contiguous U.S. and imports from there reflect production costs plus transportation charges. Prices of these imports are largely exogenously determined, hence this portion of the local inflation rate is imported. Endogenous price determination is more characteristic in markets for land, housing

Table 41

PRICE INDEX COMPARISON: ANCHORAGE/U. S.
1979-1980

Date	74	% Change	75	% Change	76	% Change	77	% Change	78	% Change	79	% Change	80	Rate of Change 1974-80
JANUARY LABOR INDEX														
Us.														
All Items	139.7	11.7	156.1	6.8	166.7	5.2	175.3	6.6	186.9	9.5	204.7	13.9	233.2	8.9
Ancho rage														
All Items	125.6	13.8	142.9	11.1	158.8	6.7	169.4	5.8	179.2	10.5	198.1	10.1	218.2	9.6
Food and Beverage	133.9	20.2	161. o	6.8	171.9	3.9	178.6	7.7	192.4	22.3	235. 4	7.7	253.5	11.22
Housing	124.9	10.7	138.3	12.4	162.4	5.4	171.1	3.6	177.3	10.8	196.5	10.6	217.4	9.67
Transportation	114.8	11.4	127.9	10.0	140.7	10.9	156.0	7.9	168.4	9.1	183.8	14.6	210.6	10.64

and the provision of local services, although imports provide some competition.

Locational advantages lead to rising local land values which, in turn, are embodied in housing prices and rental rates not totally ameliorated by import substitution (in this case purchasing imports rather than local goods: mobile homes, for example),

In the labor market, local lack of amenities and higher living costs result in higher nominal wage rates. Given the relative mobility of the labor force, these higher nominal rates can, for only short periods of time, be captured as higher real wage rates. The immigration of workers during the TAP's years attests to the openness of the Alaskan labor market.

Unfortunately, no CPI exists for the major communities of the Kenai Peninsula. Much of the discussion of price effects must be inferential, rather than based on a scientific sampling of items. The U. S./ Anchorage CPI relationship is not unlike what one should expect between Anchorage and the various Kenai Peninsula communities. Commodities freely traded between the regions should show approximately the same price trends: any difference would be largely due to changing transportation costs and/or growing local competition over time. Land, being the least mobile resource, would reflect the interregional differences in demand associated with a particular project such as the Lower Cook Inlet sale. These higher land prices would be reflected in higher housing prices and apartment rentals.

As presented in another section (Business Cycles/Fluctuation), assessed real property valuations rose throughout the Kenai Peninsula during the 1976-79 period. This real estate boom was attributed to

TAP's and the Collier plant construction. It was also argued that some of the increased real property valuations in the Homer area were attributed to speculative buying in anticipation of oil discoveries in the Cook Inlet.

Table 42 represents an attempt to further measure activity in local real estate markets. The totals in this table represent a summary of advertisements for the different categories of real estate transactions. Obviously, this is less than a perfect index of real estate activity. The sums were derived at by totalling the ads in a given edition of the respective newspaper for each month. Even though some double counting is involved, the growing or decreasing volume of advertisements does serve as an indicator of the aggregate level of activity. The question is: how should the changing levels of activity be interpreted for the various categories, as both supply and demand elements are reflected in the ads.

The Homer statistics are relatively unambiguous and reflect a general increase in activity throughout the period. Data on vacancy rates and authorized housing units support the bullish view of the Homer housing (real estate] market during this period. Housing units authorized in 1979 showed a twenty-three percent increase over 1978 (see section on Business Cycles/Fluctuations). In addition, apartment vacancy rates in Homer for 1979 were less than fifty percent of Kenai's vacancies and substantially less than vacancies in Soldotna. When evaluated in trms of the relationships to lower Cook Inlet oil-related activity, it is interesting to note that these housing data correspond in timing to the peak level of exploration activity. Table 42 indicates a level of activity that probably includes some speculative activity associ-

Table 42

HOUSING MARKET INDICATORS*

Homer

Year	Number of Houses or Apartments for Rent	Number of Houses or Mobile Homes For Sale	Number of Lots for Sale
1977	76	135	300
1978	143	240	588
1979	179	240	542

Kenai

Year	Number of Houses or Apartments for Rent	Number of Houses or Mobile Homes For Sale	Number of Lots for Sale
1977	99	548	296
1978[1]	(195)	(199)	(72)
1979	499	326	160

*These represent numbers of ads and not necessarily separate housing units or land parcels.
[1]Six months only.

ated with the lease sale; other available data do not support the contention that this activity increase was demographically generated.

The Kenai statistics are mixed, but indicate an earlier peak (1977), then a decline. The dramatic increase in rental advertising, combined with the reduction in the other categories, appears to reflect excess capacity in the rental market and a slowdown in other real estate sectors. The timing is congruent with the TAP's slowdown and the completion of the Collier addition. Other housing data reinforce this conclusion. Authorized housing units in the Kenai/Soldotna area declines from a peak of 444 in 1977 to eighty-seven to 1979, a drop of over eighty percent. One might also suspect that some units were transferred from the sale category to the rental category, as the real estate market switched from a seller's to a buyer's market. Vacancy rates were also higher in 1979 than the previous year.

Tables 43 and 44 provide some indication of price behavior in the labor market. Nominal wages increased for all labor categories from 1975 to 1977, a period influenced by TAP's and Collier construction. In 1978, a number of important categories show a decline in nominal wages with construction being the most dramatic with a twenty-seven percent decline. Categories showing strong gains are transportation, communication and utilities (TCU) with 16.5 percent, followed by the federal government at 12.2 percent and agriculture with 11.8 percent.

Table 44 reveals that mining, TCU, federal government, state and local government, retail and agricultural sectors registered real gains (as measured by the Anchorage CPI) between 1977 and 1978.

Table 43

AVERAGE ANNUAL WAGES PER WORKER
Kenai-Cook Inlet Division
(Current Dollars)

	1975	1976	1977	1978
Mining	28,078	31,406	31,473	32,958
Contract Construction	26,762	28,852	33,246	24,260
Manufacturing	15,105	18,346	20,033	21,178
Transportation, Communication and Utilities	25,089	27,750	29,525	34,409
Trade				
Wholesale	21,840	26,439	25,582	24,392
Retail	9,106	10,363	10,815	11,379
Finance, Insurance and Real Estate	10,351	11,929	14,172	14,503
Services	12,595	15,871	17,518	16,780
Miscellaneous	21,841	25,125	34,320	23,880
Government				
Federal	16,711	18,085	20,408	22,839[1]
State and Local	14,118	15,773	16,992	18,503
Agriculture	6,000	7,000	8,500	10,000
Total Average	18,207	20,942	23,427	21,384

[1]Includes wages and salaries for military and related federal civilian employment.

Source: Situation and Prospects, January, 1980, Kenai Peninsula Borough.

/

Table 44

AVERAGE ANNUAL WAGES PER WORKER
Kenai-Cook Inlet Division
(1967 Dollars)

	1975	1976	1977	1978
Mining	18,595	19,232	18,067	18,109
Contract Construction	17,723	17,668	19,085	13,330
Manufacturing	10,003	11,235	11,500	11,636
Transportation, Communication and Utilities	16,615	16,993	16,949	18,904
Trade				
Wholesale	14,464	16,190	14,685	13,402
Retail	6,030	6,346	6,208	6,252
Finance, Insurance and Real Estate	6,855	7,305	8,135	7,969
Services	8,321	9,719	10,056	9,055
Miscellaneous	14,464	15,386	19,701	13,121
Government				
Federal	11,067	11,075	11,715	12,549
State and Local	9,350	9,475	9,754	10,166
Agriculture	3,974	4,287	4,879	5,495
Total Average	12,058	12,824	13,448	11,749

Federal and state wages are determined exogenously, hence are not influenced by regional economic activity, although the measure used here could increase if the composition of federal and state employment was affected by the Lower Cook Inlet sale, Mining and TCU are the sectors most likely affected by the level of activity associated with the Lower Cook Inlet sale. These are also the sectors with the most specialized labor skills and with unions that could take advantage of regional/local market conditions,

The survey of local food prices consisted of recording monthly advertised prices in the local newspapers (Homer News and Peninsula Clarion). The categories on which data were collected were: meat/ poultry/fish, selected fruits and vegetables, grains and bread, dairy products, sugar and coffee. These prices moved in the same direction and approximately the same magnitude as the food and beverage component of the Anchorage CPI. The interregional nature of the market for these commodities would lead one to anticipate this result.

MITIGATING MEASURES

This section addresses the efforts by the local communities to mitigate the impacts which could arise from activity associated with the Lower Cook Inlet Lease Sale. Because of its proximity to the sale site, as well as the fact that it was not already engaged in oil-related activities, Homer probably devoted the most time and effort to impact analyses and planning. If one is willing to accept the local newspaper (Homer News) as a mirror of the community for the period under discussion, the reflection one sees is a community undergoing change and divided by the potential futures implicit in change. That this is so should not be suprising, as the potential futures (as perceived in 1977 and 1978) contained different distributions of benefits and costs for residents and potential residents of Homer.

According to Webster (Webster's Seventh New Collegiate Dictionary, 1976), impacts are "(la) an impinging or striking (as one body against another); (lb) a forceful contact, collision or onset . , . ; 2) the force of impression or operation of one thing on another: effect. " In any case, the operative definition of impact seems forceful and, on balance, negative. More importantly, the community was in the midst of a debate over potential, not actual, impacts. The same source defines mitigate as "(l) to cause to become less harsh or hostile: mollify; or 2) to make less severe or painful: alleviate. "

Much of the City Council's time during the 1977-79 period was devoted to discussing ways of mitigating the impacts of potential growth on Homer. The oil industry was viewed as a major potential source of these impacts. It should not be surprising that a community concensus

was not reached concerning the desirability of economic growth for the area or a particular growth strategy. Nor was the community able to resolve its ambivalence towards oil-related economic growth. As of this writing, only the lack of an oil discovery has spared the community from dealing directly with oil-related growth issues,

A community's inability to directly address the oil/growth issue is the result of the ambiguous nature of socioeconomic impacts. They are seldom all bad or all good, and have important and often subtle affects on a communit y's level of real income and wealth. These effects are often redistributed among the community's resident population; consequently, the development of a political concensus leading to well-defined growth strategy with effective mitigating measures for "negative impacts" is unlikely, Negative impacts, in one person's view, may mean real income or wealth for another (rapidly rising land prices or rents, for example). Thus, "mitigation" involves significant income and wealth distributional issues. Zoning benefits some, but reduces opportunities for others,

This ambivalence toward perceived alternative futures is illustrated in the various planning documents of the local communities as well as articles, editorials and letters to the editor in the local newspapers. The newspaper articles not only reflect what was happening in the region, but the reports of community meetings and letters to the editor provide insight into the community's attitude toward the proposed project (i. e. , Lower Cook Inlet sale). The planning documents represent the transformation of the communit y's attitudes into modes of action/inaction expressed in the communit y's political process and represented by the planning documents,

This section will survey a number of community planning documents. The focus of this survey is on the manner in which these plans incorporate information related to the 1977 Lower Cook Inlet sale. Six plans have been analyzed: Growth Management Strategy, Seward (1979), Soldotna Comprehensive Development Plan (1979), Homer Drainage Management Plan (1979), Master Plan for Roads and Streets (1979), The Homer Comprehensive Plan (1978) and, finally, Soldotna Traffic and Access Plan (1980).

Of the planning documents reviewed, the Seward Growth Management Strategy (1979) attaches the least importance to the Lower Cook Inlet sale. The basic growth scenario includes impacts associated with sales in the Gulf of Alaska, Kodiak/Aleutian area, Lower Cook Inlet and other Kodiak sales. Employment in the Seward area is projected to grow at between 7.5 percent and 1.8 percent per year during the 1980's. The Lower Cook sale is not assumed to significantly affect these growth rates. At best, the sale may generate some port activity in Seward as goods may be shipped from the Lower 48 to Seward, then transported to the rigs in the Lower Cook Inlet.

The Soldotna Comprehensive Development Plan (1979) extensively addresses the potential impacts associated with the Lower Cook sale. Page III- 7 states the basic presumption underlying the document's analysis of the sale's impacts:

> At this point in time, it is difficult to plot the development of Outer Continental Shelf activity until it is known if gas and oil reserves are located in the Lower Cook Inlet to any significant degree. The second forecasting problem is determining the location of the Permanent Supply Base and Oil Terminal. Nikiski appears to be the leader for the Permanent Supply Base and Oil Terminal. It is the only port city located on the west side of the Peninsula capable of handling the marine traffic

required for the Permanent Supply Base and already has storage facilities with tanker docking capabilities.

The basic employment forecast contained in this plan assumes that oil and gas will be found in commercial quantities in the Lower Cook Inlet and Nikiski will be selected as the permanent supply base. The net effect of this assumption is to increase the growth rate of Soldotna's employment and population from ten percent per year through 1995 to 11.6 percent per year. The document contains no discussion as to how this incremental difference was derived.

Because the baseline forecast of employment contains a number of other exogenous assumptions that influence the local economy, it is difficult to attribute specific recommendations to the Lower Cook sale. The plan recommends the development of an industrial park as a component of' an economic diversification strategy for Soldotna. Zoning is to be used to protect the integrity of residential neighborhoods as well as encourage the development of a central business district. New parks should be oriented towards neighborhood use.

Additionally, it is recommended that some new community facilities be constructed (city hall/public safety building) in a central location. School system and health care facilities appear adequate for any "reasonable" range of future growth paths. Finally, the plan recommends a doubling of the number of fire trucks and operating personnel by 1985.

It is very difficult to evaluate this planning document as a basis for recognizing or instituting mitigating measures. The document's analytic foundations are confused and ambiguous. The selection of the 11.6 percent as opposed to the ten percent growth rate (a sixteen percent increase) as representative of sale-related influences is not analy -

tically supported. Therefore, it is impossible to judge its reasonableness.

The Homer Drainage Management Plan (1979) analyzes the city's existing drainage system and develops a management plan with design criteria and approach to facility construction. The plan was instituted because ". . . recent rapid development and expected future growth have prompted local concern over storm water drainage control in Homer." (p. 1) As the following exerpts indicate, the plan explicitly recognizes the potential impact of the Lower Cook sale on the local community:

> A federal oil and gas lease sale, held in October 1977 has resulted in offshore exploration activity near Homer. The Homer city dock is located approximately forty miles from the central area of the lease sale and the City will experience economic and population impacts if oil and 'gas are discovered and developed.
>
> As of spring 1979, two drilling rigs were operating in Lower Cook Inlet, with no reported discoveries. During the exploration phase, Homer will provide water and fuel for supply boats and the Homer Airport will serve as a transfer point for drilling rig crews. If major discoveries are made, there will be an increasing demand for onshore facilities, staging areas and dock space in the Homer area." (p. 10)

Even though there is a potential for substantial impacts related to oil, the plan recognizes that other factors will also shape the development of Homer's economy:

> In addition to the economic potential of both bottomfish and oil development, the retail services and trades are growing employment sectors. Between 1976 and 1978, a total of forty-six commercial building permits were issued. These included the construction of a new shopping mall, office space and a bank branch. Tourism and recreation area also increasing, with most tourist-related commercial activity located on Pioneer Avenue and on Homer Spit." (p. 10)

Obviously, the pipeline boom was influencing Homer's economy. The tourist-related sectors benefited from growth in the Anchorage area. In some respects this boom was creating some of the capacity in the local infrastructure that would be needed if commercial quantities of hydrocarbons were discovered in the Lower Cook Inlet.

The Homer Master Plan for Roads and Streets was completed in October 1979, The preface states that:

> The compilation and establishment of a Master Roads and Streets Plan is timely because of the potential impact of oil development and bottomfisheries on the City of Homer. The Plan will provide a guideline for orderly growth and hopefully enable the City to react to demands on the transportation system as they occur and predict and correct future problem areas before they present themselves,

Furthermore, the introductory chapter defines the scope of the plan and the major recommendations as:

> Scope of Work
>
> The Scope of Work of this study is to establish the existing conditions of the transportation system, analyze the present demand and denote problem areas; thence, to establish a master plan for roads and streets for the City of Homer.
>
> Recommendations
>
> As a result of the study, it is recommended that the Master Roads and Streets Plan be adopted by Planning Commission and Council action. The Plan as represented should provide a guideline for development within the City and should be continually reviewed and updated as the travel patterns develop and change as the City grows. The Plan should further be submitted to the Kenai Peninsula Borough requesting concurrence with the route classification contained herein for the preservation for route continuity.
>
> As by-products of this study, the following conclusions and recommendations are presented:
>
> 1. The City initiate a traffic count program for acquisition of traffic volumes and flow

characteristics and provide for a permanent and continuous data to monitor, assess and evaluate the function of the surface transportation system within the City.

2. Perform a detailed field investigation, including field survey control soils analysis, research establishment of existing grades and alignment and preliminary design of the principle roads within the City.

3. Set policy guidelines on the function and use of the Homer Spit. This effort should be accomplished because of the growing and diverse demands presently being placed upon this most unique feature of the City. Since traffic volumes are directly related to land use, guidelines should be established to govern or control the long-term use of the land along the Spit and therefore the corresponding traffic demand . . ." (p.3,4)

Chapter III of the plan, entitled "System Loading Variables, " explicitly recognizes the nature of potential impacts contingent upon hydrocarbon discovery. The following exerpts illustrate the author's perspectives on a future with oil:

> It is of particular importance that these figures be monitored because of the direct correlation of trip production and population growth. Because of the recent trend state-wide, of receding growth and stabilizing economy, it may be anticipated that the growth rate for Homer will again stabilize at approximately seven (7) to seven and one-half (7%) percent. This, however, depends on the present status of the economy in the area and potential industrial growth. Two events, presently underway, may have an immediate impact on the population: the development of additional processing facilities and enlargement of the port facility on the Homer Spit. These endeavors will provide not only an immediate impact on the population and economy, but may act as a stimulus to further development. Oil related development in Cook Inlet offshore and shore development in the Central Kenai Peninsula will have a direct effect on Homer. Because of the deep-water, year-around port facilities, the impact will center on the Spit and may rely heavily upon the Homer area as a staging area.

In either case, the population should more than double with an average growth condition of seven (7) to seven and one-half (7½) percent by 1980 . . .

The potential economic impact from major industrial growth will have a multifold effect. It may be assumed that immediate impact will draw from existng available workers. This is espeially true of fisheries related industry. The effect on the transportation network will be to increase trips from the established areas of the City.

Reviewing the building permits authorized for 1978, the majority of development has occurred in the established areas of Homer where, coincidentally, public water and sewer are available. This impact will necessitate, to some degree, the improvement of several road links within those areas between East Hill Road and West Hill Road north of Pioneer Avenue between Main Street and Lake Street.

Oil related development, if we assume the use of Homer and its facilities as a staging or distribution area, will have the most impact on the area east of the Homer Airport. Designated industrial zone, the area offers relatively large tracts of land suitable for warehouses, storage yards, etc.

Providing proper access to the area would be the major problem, for the area is served adequately only by Kachemak Bay Drive. Access from the north to provide a better through movement through the central core of the City for truck traffic should be provided.

In summary, the impact of economic development directly affects the transportation network, specifically in those predominately residential areas in the central core of the City and the industrial area east of the airport. . . .

It should be noted that the recreational demand, in volume, on the Spit may eclipse the work- related activities during the peak recreational periods and that during fishing seasons these trip characteristics may change substantially.

Using these data as a base condition, one may potentially assess the impact of substantial industrial growth on the Spit. Should oil-related industries come into being, a greater demand may be expected from the east end of the City because of the

> location of the industrial zoned area and also further to the east, outside the City limits, because of the availability of large undeveloped tracts of land. The growth in the fisheries industry, being Homer resident, will reinforce the trip distribution characteristics determined by this study and as population grows and residential development occurs the travel patterns to the Spit will follow accordingly.
>
> In this vein, any increase in trips generated by industrial activity on the Spit will place an ever increasing demand on the Spit Road, the only route that traverses the Spit and provides access to it. Coupled with the increasing recreational demand, the Spit Road has the potential of becoming inadequate to meet these demands and its function as a State Highway may be curtailed and an evolution to a high volume, low speed, facility may occur. Therefore, discussions should be undertaken to determine the future of the Spit and its corresponding transportation links. The time will present itself when the Spit Road will either have to be expanded to four (4) lanes to meet the volume demands, or to regulate and control the demands such that expansion of the facility need not occur. Further, the capability of the physical expansion of the facility may be reduced due to the economical and environmental stability of the area.

This plan clearly recognizes the potentials associated with OCS activity. The problem is in the nature of the activity. Because of the wide variation in potential outcomes, oil activities are extremely difficult planning problems. The Lower Cook Inlet sale offered the low probability of a 2.6 billion barrel discovery and the high probability of no discovery. In an expected value sense, the optimal plan may assume only modest oil-related impacts even if oil is discovered.

Homer's Comprehensive Development Plan Revised (1978) also recognized potential OCS impacts. To quote from the preface:

> The purpose of this Revised Comprehensive Development Plan is to provide the community with an outline denoting the cit y's present situation, probably changes due to forces both internal and external which will reflect on the evolution and

character of Homer, and recommended methods for coping with these changes as they occur.

A special section in the plan discusses OCS development and recommends that the city monitor exploratory activity and be prepared to deal with:

1. crime related to unemployed workers and indigent workers (presumably attracted by oil-related activities)
2. increased alcohol abuse and related problems
3. escalating land values and rents
4. inflationary effects on commodity and service prices
5. traffic congestion
6. demand for temporary housing and campground congestion

The most obvious local resource that would be directly influenced by oil development is the Homer Spit. Issues relating to the competitive uses of the Spit (fishing, tourism, oil) surfaced continually at council meetings during the 1977-79 period, but the plan only mentions the need for a Spit land use plan to allocate the Spit's limited access space,

Chapters IV (Business and Economics) and V (Community Facilities and Services) discuss the oil development possibilities using scenarios drawn from CH²M Hill's "Offshore Oil Development in Lower Cook Inlet: Implications for the Kenai Peninsua, 1978. " The discussion focuses on the range of potential impacts. Particular recognition is made of the impacts of development on the local housing market, which at the time of the plan's presentation was extremely tight and characterized by little excess capacity. It should be noted that the plan's baseline growth rate was seven percent per year without oil development and was projected to more than double with oil development. In addition, the plan

asserted the need for significant infrastructural investments if oil development was to occur. Finally, it was stated that there was a need for a constant updating of the plan as OCS activities proceeded.

All of the plans reviewed in this section adopted the minimum impact strategy with the caveat that important revisions would be necessary if oil was discovered. Only the Soldotna Comprehensive Plan assumed a commercial discovery as part of its baseline scenario. Even in this case, it was not possible to assign specific recommendations to the assumed OCS activity.

Perhaps one should not expect too much from planning documents. After all, they are expressions of community preferences and goals and only secondarily analytic documents. Their worth as planning tools is dependent upon the way in which they assimilate and synthesize analytic information. In this respect, the Homer planning documents fare better than the others reviewed here. They are explicit in their recognition of OCS activities and relate specific proposals to these activities.

Local newspapers were reviewed for Homer (Homer News), Kenai (Peninsula Clarion) and Seward (Phoenix Log). All feature stories, editorials and letters to the editor related to the Lower Cook Inlet lease sale are summarized and presented in this section. The Homer newspaper constantly addressed the Lower Cook Inlet sale and its potential impacts. Very few comments or articles were written in either the Peninsula Clarion or the Phoenix Log.

Journal of Homer News Articles

1977

27 January

p.1 "City council meeting receives plan"

Synopsis: CH2M Hill presents water and sewer plan for the city with special emphasis on facilities needed for the Spit. Population growth rate projected at seven percent, assuming no oil development. Population to reach 5,000 in five years. Present system adequate for population of 4,300. If Spit becomes base for supply boats, water demand is projetted to double over non-OCS scenario; therefore, Homer would need two new treatment plants within ten years. CH2M Hill recommends that city apply for OCS impact monies to build facilities.

p.5 Letter to editor telling readers where to write if they oppose sale.

3 February

p.1 "Inlet oil sale taken to court"

Plaintiffs are: English Bay Corporation, North Pacific Fisheries Association, Trustees for Alaska, Friends of the Earth, Alaska Conservation Society and two local residents, Gain and Bill Bledsoe, Plaintiffs ask that the sale be halted until ongoing studies of the lower Cook Inlet are completed and CZM is in place.

p.1 "Forum hears Homer on oil, land"

Alaska Public Forum held a town meeting in Homer, Of those participating, fifty-six present wanted a moratorium placed on the selling of the state's fossil fuel resources, while thirty-seven present wanted the resources leased, but at a steady rate.

10 February

p.1 "Oil lease sale cancelled"

Andrus announced cancellation of Lower Cook Inlet sale for at least ninety days.

p.1 "Budget cut affects local habitat project"

Due to cuts in ADF&G budget, it appears that the Kachemak Bay Habitat Project office will be forced to move out of Homer, ADF&G officials will determine if the demands of the Lower Cook Inlet sale justify the office remaining in Homer.

p.1 "Residents like Homer as it is"

Article is based on a survey/study by Dr. Michael Baring-Gould entitled "A Profile of Five Kenai Peninsula Towns." According to the survey, seventy-five percent of the respondents wanted petrochemical development discouraged, seventy-two percent wanted to discourage heavy industry and sixty-two percent opposed Homer as a supply base for service boats. The survey found that the citizenry liked the size, beauty and atmosphere of Homer and generally opposed oil- related development.

p.2 "Council discusses survey"

Professor Baring- Gould gave a formal presentation of survey results. Council then proceeded to have a lengthy inconclusive discussion over merits of OCS development.

p.4 Editorial: "Some value from the survey"

Several notions emerged from Council discussion, of which the most predominant was that control of Homer's growth is out of the town's hands. Councilman Winn disagreed, noting that zoning changes were needed for the Spit to become a support site. Editorial writer (Homer's mayor) supported this view, also pointed out that much of the discussion was not of controlling growth, but returning to the past. This was not viewed as an option by the editor/mayor.

24 February

p.1 "Baring-Gould study out"

Further discussion of survey results.

p.4 Editorial: "What the Baring-Gould study means"

Editor observes that survey results are inconsistent with actions of the city government. He then advocates the need to develop a comprehensive plan and zoning ordinances.

p.5 Letter to the editor opposed to oil and gas development in Kachemak Bay.

3 March

p.4 Editorial: "The value in study"

Stresses the need for the habitat project if oil and gas lease sale is held.

24 March

p.3 "News of Seldovia" column

Professors Baring-Gould and Heasly of the University of Alaska, Anchorage, to talk on their study and chair a discussion on issues facing Seldovia if Lower Cook Inlet sale is held. The meeting was scheduled for the evening on the 25th and 26th of March.

p.4 Editorial: "Time for planning:

Editor/mayor exerts local officials and citizens to use cancellation period for planning.

31 March

p.1 "Valdez officials visit Homer"

Professor Baring-Gould plus two city officials from Valdez met with Homer City Council and the Advisory Port and Harbor Commission. The Baring- Gould study is discussed in light of Valdez experience, Valdez officials stress the importance of zoning as a means of controlling growth.

p.4 Editorial: "The Valdez messengers"

Lessons of Valdez: (1) You have to do something; (2) you must first figure out what the alternatives are; (3) then you must find a consensus; and (4) then you must act. Homer potentially on the verge of a huge boom,

Editorial: "Our own responsibility"

Stresses the need for more city council meetings to deal with oil-related growth issues.

p.5 "What kind of future?"

Will Homer be able to control development if oil and gas activities start?

7 April

p.1 "City officials to discuss oil growth"

City Council meeting scheduled for the 13th of April, Agenda specifically oriented toward discussion of impacts related to oil development.

p.1 "Habitat to remain in Homer"

ADF&G office to remain in Homer, It will be needed for monitoring studies if the scheduled lease sale is held.

p.4 Editorial cartoon dealing with potential oil boom.

p.14 Letter to editor discussing the City Council's ambivalent view toward oil development.

14 April

p.1 "Homer to be studied again"

Referenced study dealt with a second Gulf sale and the need for a community inventory. People wanted to know why similar study wasn't done before proposed Lower Cook inlet sale.

21 April

p.4 Editorial: "It was a beginning"

City Council complimented for holding a meeting with two advisory commissions (Planning and Zoning, Port and Harbor), where the growth possibilities facing Homer were discussed.

p.8 "Citizens coalition of coastal communities"

Citizen's groups formed to protect coastal resources from adverse impacts of development.

p.18 "Officials meet to discuss Homer's future"

Article reports on April 13th meeting where the Homer City Council, two advisory commissions, Kenai Peninsula Borough planning director, mayor (Homer) and city manager discussed the city's development options.

12 May

p.1 "Homerites talk with Andrus"

Reports on a meeting held in Washington, D. C. , wherein Andrus informed members of local citizen's groups that a final decision on whether to hold Lower Cook Inlet sale would be made soon.

p.8 "Borough acquires planning money"

Kenai Peninsula Borough received $150,000 from state. The money is to be used to help local communities develop strategies for dealing with OCS impacts.

19 May

p.1 "Lower Cook Inlet lease sale set for October"

DOI announces plans to proceed with sale process and sets date in October.

26 May

p.1 "Harbor faces crowding problem"

"Homer harbormaster asserts that harbor is too small to handle big boats such as service boats for oil rigs. There are only 430 slips and already overcrowding is a problem.

2 June

p.20 "City officials discuss policy"

City Council, Planning and Zoning Commission and Port and Harbor Commission rehash Baring- Gould study and the communit y's attitude toward growth. *

9 June

p.1 "Drill rig in Inlet"

The Arco rig Ocean Ranger is reported forty-two miles southwest of Homer. Rig is to be used for stratographic test in sale area.

p.4 Editorial cartoon depicting stratographic test.

p.5 "Coastal plan - for better or worse"

A guest editorial describing CZM and its role in the OCS ,

p.10 "Oil-fishermen meet in Norway"

Homer News interviews NOAA official about North Sea oil development. Emphasis of interview is on conflicts between fishing industry and oil development.

16 June

p.1 "Supply boats work out of Homer"

City is in the process of installing a new water main on the Spit. Water will be supplied to workboats attached to Ocean Ranger.

p.2 "ARCO helicopter at Homer airport"

Helicopter used to transport personnel to Ocean Ranger. It is scheduled to make two flights daily.

p.4 Editorial: "Stalled on crossing"

Editor notes that exploratory activity has commenced whether or not Homer is prepared. The City Council is chided for evading the issue and not developing a zoning policy . Poor citizen turnout at council meetings also discussed.

p.11 "The Hollis Hedberg is here to look for oil"

The ship is scheduled to spend the summer in the Homer area. It is equipped to perform complete seismic analysis.

23 June

p.1 "Waterline, recreation, topics of council discussion"

Council discusses needs for Arco rig and accompanying supply ships. Water main and slip for 180 foot tenders required.

30 June

p.1 "Logging firm asks for Spit land"

Local firm requests storage space so it can ship logs by boat. Discussion highlights land use conflicts in Spit.

7 July

p.1 "Ocean Ranger toured by Homerites"

Local officials and reporters tour the Ocean Ranger as guests of Arco. According to Arco, it costs $78,000 per day for lease and operating costs.

14 Julv

p.4 Guest editorial from Anchorage Daily News: "End to the charade"

Discusses the apparent lack of environmental and social impact analysis prior to Lower Cook Inlet sale. Writer suggests that Alaska's D. C. delegates exert pressure to correct this oversight.

p.10 "Environs" column

A discussion of environmental and fishing conflicts attendant to OCS activity near Homer. State recommendations for Lower Cook Inlet sale are listed.

p.11 "Local leaders meet with federal official"

The pending sale is discussed. The mayor asks for a three to six month delay so that local governments can assess needs and prepare for impacts,

21 July

p.1 "Shipping company request raises questions on Spit development"

At previous week's council meeting, a shipping company requested space on Spit for log storage. This use would conflict with other uses, including the storage of supplies for the oil rig.

p.4 Editorial: "Logrolling on the Spit"

Raises issue that decisions on Spit use not independent of the vision of Homer's future. Resolution of use conflicts will shape future of city.

Editorial: "Wrong time, wrong place"

Lower Cook Inlet sale is being held too soon. Delay would allow everyone more time to prepare.

28 July

p.1 "Andrus: Inlet ready for sale"

Secretary comments during four day visit to Alaska, including time spent in Homer.

p.1 "Seismic boat operators, fishermen meet"

Report on apparent conflict over use of certain areas between survey boat and crab fishermen. Ten "incidents" since May involving crab gear.

p.1 "Council says no to logs, no to tourists on Spit"

Council in trial vote refuses log storage or camping on city owned land.

4 August

p.1 "Council and Chamber focus on Spit use"

Homer Chamber of Commerce asks for public hearing on Spit land use. Chamber disagrees with exclusion of tourist uses on city owned Spit land. According to city attorney, cancellation of campground lease is legal.

p.4 Editorial: "The Spit"

Writer focuses on the need for a land use plan and more citizen input into local government.

11 August

p.1 "Save our Spit league organizes"

A citizen's group is formed to promote and protect traditional uses of the Spit (fishing and recreation) and to exclude oil-related uses,

p.1 "Mayor vetos council action on Spit"

By a four to three margin, the council voted to cancel current city leases and convert campground to industrial uses (log and rig supply storage).

p.4 Editorial: "1st veto"

Mayor's veto of council action was first time power had been exercised in cit y's history. Oil development viewed as the root of conflict over Spit use.

p.5 Letters to editor supporting veto action. Writers are generally anti-oil, anti-industrial development.

18 August

p.1 "Tentative hearing set for Spit"

Homer Advisory and Planning Commission sets tentative hearing date of 20 September for conflicts over Spit use.

p.4 Editorial: "The Spit"

Editorial writer/mayor argues that now is the time to think of what Homer should become. Spit was, viewed as the key to Homer's future.

25 August

p.1 "Council sustains mayor's veto"

One council member reverses previous vote, thus upholding mayor and supports current city leases on Spit.

p.4 Letter to editor argues that industy can use its own facilities located elsewhere in the peninsula.

1 September

p.4 Editorial: "Boom town"

Writer wonders if the oil boom has already started. Rapid population growth since 1975 led to water and sewer problems.

15 September

p.1 "Inlet lease sale set"

DOI announces that 135 OCS tracts will be offered on 27 October 1977.

p.1 "Cook Inlet to become a marine sanctuary?"

Federal CZM officials meet with state officials to discuss the possibility of nominating Lower Cook Inlet as a marine sanctuary. This status will not preclude oil development.

22 September

p.1 "Exxon unhappy with Lower Cook sale"

Company officers express displeasure with royalty bidding system designated for some tracts.

p.4 Letter to editor refers to Homer Spit Land Use Study. Writer proposes a master plan for the Spit.

29 September

p.1 "Mayors don't like OCS lease stipulations"

The mayors of Homer and Kenai feel that the lease stipulations do not give local communities enough information for impact planning.

p.5 Letters to the editor. Once again, Spit use is related to the cit y's future. It is suggested that the city use a 1974 study by Unwin, Scheben and Korynta as a basis for planning. It is argued that the city doesn't need oil development.

p.12 "Council candidates field issues"

Spit use is the big issue. Planning and new zoning regulations are suggested. Newspaper poses a series of questions to the candidates concerning their attitude toward growth.

6 October

p.1 "Interior overrides state on Inlet lease sale"

Sale includes tracts that the state assumed would be deleted owing to their environmental sensitivity y. "DOI also ignored stipulations suggested by the state for the remaining tracts.

p.1 "ARCO plans sublease of Monley's Spit land"

Arco reveals plan to sublease city owned Spit land for the storage and transshipment of light goods to drilling rig.

p.22 "Residents invited to coastal workshop"

State Coastal Policy Council to meet in Homer in order to solicit local input for the development of CZM standards.

13 October

p.1 "OCS outlook 'not bad' says state"

Federal government added regulations allowing for emergency shutdown of drilling operations.

p.1 "Coastal workshop to host local residents Thursday"

Article discusses agenda for the meeting with the State Coastal Policy Council. Stress is placed on the importance of citizen imput.

p.2 "Manager calls questions on growth"

The city manager asks the city council to take a definite stand on sewer and water extensions, port use and street improvements. Manager wants some council expression of a growth policy.

p.4 "Editorial: "Agreement on oil"

Writer expresses concern over drilling safety and efficiency of cleanup. Wants more local control.

Editorial: "Not ready for coastal planning"

The thirty month time period to develop a CZM plan is too short.

Issue contained a special ten page filler with a questionnaire entitled "Choices for the Coast. " Deals with the development of a CZM plan.

10 October

p.1 "Land use problems and school strife face borough"

There is a need to control development, Industrial water problems are already surfacing in the borough. It is agreed that sites for future energy facilities should be established now. Oil discoveries in Lower Cook Inlet would accelcrate growth throughout the borough,

p.1 "Lease sale off Homer set for next Thursday"

Sale to be held at Captain Cook Hotel. Bidding methods and expected bid amounts are discussed.

p.4 Editorial: "The guns of February"

Oil activity inevitable given the pending sale and the high level of industry interest.

p.6 Announcement of AOGA seminar planned for November, It will be an informational meeting explaining the oil industry to local residents.

p.6 "Slide lecture at museum"

Program called "Sea Life in Tanker Lanes." Explains the potential effect of tanker traffic in Kachemak Bay, Lecture is scheduled for the 26th of October.

27 October

p.1 "Council acts on growth"

City Council passes resolutions supporting moderate expansion of city utilities and fully utilizing existing port facilities. Council supports the development of a master plan.

p.1 "Homer turnout wants protection for coast"

Citizens at last Thursday's coastal policy meeting express desire to protect coastal habitat and preserve Homer lifestyle,

p.1 "Homer economy solid, says bank manager"

States that local economy grew thirteen percent this year and predicts growth of thirteen to fifteen percent for next year. Oil only plays a small role in projection, but that role could change in the future.

p.2 "New rule called drilling safeguard"

New federal regulations provide for further scientific study of the sale area and permits additional drilling restrictions, if necessary. Secretary of Interior has authority to suspend drilling activity.

p.4 Letter to editor by local citizen argues that state CZM program is wasting too much money.

3 November

p.1 "Bidding is enthusiastic, but erratic"

Sale activity of previous Thursday is described. Anchor Point tracts draw high bids.

p.4 Guest editorial from the Manchester, New Hampshire, New Leader: "Homer, Alaska's Cape Cod"

Discusses conflict over use of natural resources and the potential threat to the fishery posed by the oil industry. Damage could occur to both the recreational and commercial fishery.

Letter to the editor entitled "Recreation pays"

Writer suggests the use of user fees for tourists wishing to use the Spit.

p.5 "Cook Inlet background"

A discussion of the hydrocarbon geology of the area.

p.9 "Oil activity might someday mean direct freight, Sealand says"

Increased volume of supplies might generate enough business for direct delivery, rather than going through Anchorage.

p.11 "Seminar is offered on oil and gas"

AOGA'S four night seminar will describe the oil industry to the local townspeople.

p.18 "Meetings" column

Arco to show slides of the type of drilling rigs to be used in the sale area.

10 November

p.1 "Drilling could begin in 3-4 months"

Oil companies need to submit plans and acquire necessary permits.

17 November

p.1 "Seldovia invites oil base"

Seldovia city council passes resolution inviting the oil industry to use city land and city dock .

p.3 "Interior, state support corridor"

Agencies working to establish shipping corridors to reduce conflicts with fishing vessels and equipment.

p.3 "Homer to hire planner"

City to hire a planner to help develop a comprehensive plan and draw up a new zoning ordinance for the city.

p.4 Editorial: "Questions, choices"

A discussion of the conflicting effects associated with the recent 200 mile limit for domestic fishermen and the oil industry's impact on the locally based fishing industry.

24 November

p.1 "Tom Kelly tells of oil benefits"

In a speech before the local Chamber of Commerce, Tom Kelly extolls the virtues of oil-based development.

p.16 "Dock promoted"

Promoters propose to build a privately financed dock and negotiate with the oil industry for its use.

1 December

p.1 "Arco sees little impact on Homer"

They will ship heavy supplies out of Seward and Nikiski during the 'exploration phase. Only limited port calls at Homer and Seldovia for water and fuel. Will use Homer as their helicopter base.

p.20 "Homer planning monies blocked"

Legislature's Budget and Audit Committee blocks $500,000 grant of energy impact funds designated for Homer.

29 December

p.1 "Dumping studied in Cook Inlet"

Drill muds and cuttings will be dumped into Inlet by Arco rig in a controlled study of affects of such substances on fishery. Study to be done by the Fishery Research Institute of the University of Washington and Dames and Moore.

p.5 "Oil brings change to the Shetland Islands"

A description of oil industry impacts associated with North Sea development on the traditional economy of the Shetland Islands.

1978

5 January

p.1 "Commission says no to private dock"

The Port and Harbor Commission votes against permitting the building of a private dock. Dock was to be used for oil related activity.

12 January

p.3 "Dispute eases over Arco sublease"

City will permit the Arco helicopter crew, mechanic and expiditer to live in apartments at the Manley Terminal. This land is on the Spit and leased from the city.

p.4 Editorial: "Time for Decisions"

A discussion of the Manley Terminal issue. Should the city promote OCS uses of dock? In addition, the editorial lauds the City Council for its approval of funds to hire a new City Planner . Planner will have the specific job of drawing up a new comprehensive plan.

2 February

p.1 "Impact money denied Homer"

City request for federal funds denied by state agency. Funds were to be used for OCS impact planning.

p.1 "Coastal zone guidelines released"

State CZM agency to hold public hearings in Homer on the 4th of March. Hearings will deal with new state CZM guidelines.

P.2 "Arco applies to drill offshore"

Arco is the first company to apply for drilling permit. According to company spokesman, water, fuel and light supplies will be shipped to rig from Homer.

9 February

p.1 "City looks at new plan"

Homer Advisory Planning Commission begins to review draft of new comprehensive plan.

p.2 "Marathon oil scouts Homer"

Company representatives visit Homer to scout and assess potential staging areas for rig supplies. Hope to begin drilling in the summer.

p.2 "Test well data released"

U.S. G. S. releases a report describing the results of last summer's stratigraphic tests,

23 February

p.1 "New plan getting a close look"

New comprehensive plan projects seven percent growth rate without oil activity and much more with, depending on the size of the discovery. OCS discovery would stress the communit y's inf restructure.

p.4 Editorial: "Thoughts on spills"

Argues that oil spill cleanup equipment should be based in Homer so as to protect Kachemak Bay. Equipment currently stored in Anchorage and would result in too much lag time after emergency began,

2 March

p.1 "Marathon will drill Lower Cook tract"

Company hopes to begin drilling by summer. Project ninety flights per month to drill rig from Homer airport, Supply boat (200 foot) will make three port calls per month in Homer.

p.1 "Lands End . . , really for sale"

Location considered an ideal spot for OCS staging area.

p.1 "Shipper balk on corridor"

Oil industry and fishermen disagree over limits on tanker traffic, Industry unwilling to reimburse fishermen for gear lost in southern corridor.

23 March

p.1 "OCS study calls for local action"

CH2M Hill study done for borough recommends that zoning be established outside of city limits, Report discussed strategies for dealing with OCS development to minimize adverse impacts.

6 April

p.1 "Recommendation calls for balance"

Advisory Planning Commission meeting discusses draft comprehensive plan. Express need to plan for moderate development.

4 May

p.4 Editoral: "Time to be ready"

A discussion of the need for an adequate oil spill contingency plan. Major oil spill viewed as diasterous for the area.

p.17 "Thousand shares" (Environs column)

A review of the environmental dangers from exploratory drilling and tanker traffic. Writer questions the adequacy of oil spill plans, as he feels that oil spill technology is inadequate.

25 May

p.3 "Marathon to drill first"

Company hopes to use Homer as a staging area. They expect to ferry water and fly personnel to rigs. Some supplies would be trucked from Kenai to Homer dock. Heavy supplies shipped to rig from Marathon dock at Nikiski.

1 June

p.3 "News of Seldovia" (column)

Arco representatives meet with Seldovians to discuss the possibility of getting water for rigs if excess water is available. Would fill up tenders three times monthly.

15 June

p.12 "Arco reveals drilling plans"

Company makes its exploration plan public. They identify prospects for a six-year plan if exploration is successful, two years if not.

22 June

p.2 "Report challenges OCS leasing"

GAO critizes USGS. They claim that there was an inadequate evaluation before the sale, leading to poor minimum tract values, .

6 July

p.8 "Oil well asked"

Amarex Oil Co. asks permission to drill a site that conflicts with drift net fishing.

13 July

p.2 "Marathon's Dragon arrives soon"

Exploratory drill rig to arrive on location between 20th and 25th of July.

20 July

p.1 "Tuesday is hearing on new plan"

Downtown core and tourism are phased out according to the plan. Plan takes no stand on offshore oil development. City should carefully monitor the exploratory phase and be prepared to deal with:

1) more crime that is related to unemployment and indignet job seekers;
2) alcohol abuse and related problems;
3) rapidly escalating land values and rents;
4) inflationary commodity and service-related prices; and
5) increased traffic congestion.

p.4 Editorial: "Homer's new plan"

Criticizes plan because it basically ducks the issue of competing (conflicting) uses for Homer's resources.

p.16 "Arco explains Lower Cook drilling plans"

Expect their drill rig to arrive by March or April of 1979. Primary support centers will be Kenai and Nikiski.

27 July

p.2 "Marathon oil begins drilling"

Exploratory drilling commences.

p.2 "Candidate Cooper says oil impact manufactured issue"

He is Republican candidate for state house.

p.15 "Film makers plan study of oil development"

California film maker has a public grant to make film dealing with local conflicts inherent in OCS development.

10 August

p.2 "Marathon's environmental training course"

Company representatives explain detailed training course required for all personnel involved in exploratory drilling,

17 August

p.2 "Film maker can't visit rig"

Marathon officials deny documentary producer permission to go on rig for filming, Calls into question company's policy on public access to rig.

14 September

p.4 "Scientist to probe effect of drilling muds on shellfish larvae"

Researchers plan controlled experiments to test toxicity of drilling muds.

28 September

p.1 "Mock spill here mopped up"

Carefully staged mock spill involving oil companies and environmental companies illustrates containment and cleanup technology.

5 October

p.1 "Marathon says well is dry"

Company denies rumors concerning exploratory well. Official states they are testing well at this time.

12 October

p.4 Editorial: "Measuring the cost"

Writer not reassured by mock cleanup. Views effort as PR by oil companies,

19 October

p.1 "Phillips drill rig arrives"

Second exploratory rig in sale area.

30 November

p.2 "Marathon analyzes"

Company still noncommittal on test results of first well.

7 December

p.2 "Marathon still testing first well"

No results yet.

14 December

p.3 "Marathon continues test on well"

Still no announcement,

21 December

p.1 "Marathon's first well a dry hole"

Cost of dry hole $10 million.

28 December

p.4 Editorial: "Looking back"

Summary of year's events discusses Lower Cook Inlet activity.

1979

4 January

p.5 "Phillips offshore rig 'a long ways' from target depth"

Exploratory rig drilling on tract fifteen miles off English Bav. Drilling officials estimate it will take them two months to "reach target depth. Expect that another drill ship will soon move into area to drill a new exploratory well.

15 February

p.1 "Arco may start drilling on lower Cook Inlet lease in June"

Arco officials talk to the Homer Chamber of Commerce. Now awaiting permit approval, Once cleared, will have drill-ship move into the area.

p.3 "Homer featured in TV commercials"

Commercial (aired statewide) features mayor of Homer explaining how oil can positively impact community.

p.4 Letter to editor critical of mayor appearing in industry ads.

8 March

p.4 Editorial: (no title)

Critizes mayor for appearing in oil industry commercial extolling the virtues of oil development in the Lower Cook Inlet.

p.4 Letter to editor that is highly critical of mayor's appearance in oil industry ads,

29 March

p.2 "Local groups press to rebut oil ads"

Three local citizen groups (fishing organizations) demand air time to counter oil company ads.

p.4 Letter to editor detailing citizen group meeting to rebut oil industry TV ads.

3 May

p.1 "Arco rig in for repairs"

Rig damaged enroute from Japan, Once repaired, it will be used in lower Cook Inlet.

9 August

p.1 "Oil men perish"

Two oil workers fell off of Homer dock attempting to board a rig tender.

Journal of Peninsula Clarion News Articles

1977

13 January

Collier Chemical, North Kenai gets temporary water use permit - $260 million expansion.

20 January

School bond issue - $16 million, Soldotna High School.

10 February

Outer Continental Shelf Impact Planning Study by the Urban Observatory found that Kenai - Soldotna supports further oil development. All communities except Homer and Seldovia support idea of shore bases. Urban observatory: Seldovia has 601 housing units, but 1,147 copies of Clarion sold; Kenai has 1,308 housing units and 2,119 copies sold.

26 May

Notice that lease sale will take place on October 27.

18 August

Special article on growth giving information on building permits, school enrollment, electrical connections, construction and labor. Colliers expansion due to be complete October 1977, laying off four to five hundred workers. Lower Cook Inlet lease sales are "expected to generate million more dollars into the Peninsula. The dollar turnover is attracting new businesses and commercial development such as banks, retail food outlets, service companies and some tourist-related entities.

29 December

Review of growth in 1977, it mentions Lower Cook Inlet sale and expected exploration to begin in 1978.

1979

2 January

"Oil industry a disappointment"

Reports Marathon's dry hole.

31 August

"Exploration tough"

Dry holes in Inlet. Oil companies drilling in Lower Cook Inlet - five attempts, three strike-outs. Lead story. Marathon division manager - "We are discouraged and . . . have no plans to continue exploratory activities in Lower Cook Inlet. " Marathon rental fee for rig "50, 000 per day. Local attitude similar to oil companies - "wait and see. " Mayor Don Gillam - "It's not surprising that nothing has been found yet; it takes time. "

Journal of Seward Phoenix Log Articles

1977

23 June

"Arco Ranger to drill near Homer"

Semi-submersible drill ship used in Gulf of Alaska and based in Seward will be used for stratigraphic test before October sale.

25 August

"OCS panel to meet in Seward"

OCSEAP user's panel to meet on the 19th and 20th of September. The purpose of the meeting is to discuss draft reports of environmental issues surrounding scheduled federal OCS sales, including the Lower Cook sale.

20 October

"Gilman predicts population growth"

According to the borough mayor, the borough is currently growing at a fourteen to eighteen percent annual rate. Future growth rates highly dependent upon oil and gas discoveries in Lower Cook Inlet.

3 November

"Lower inlet lease sale brings in half billion"

Describes bidding at 27 October sale.

23 November

"March drilling forecast in inlet"

Federal and industry officials predict when drilling may start. Arco official states that if p-reduction starts, offshore facilities go in on the west side of the inlet.

8 December

"Arco plans Seward base"

Company spokesman indicates that heavy supplies may be shipped out of Seward and Nikiski during exploration.

1978

28 September

"Oil spill demonstration is cooperative effort"

Demonstration held in Kachemak Bay on the 21st and 22nd of September. Was a cooperative federal, state and private effort illustrating a variety of oil spill cleanup and containment technologies.

5 October

"Drilling rig leaves to drill in inlet"

The Ocean Ranger finishes preparations for the drilling of an exploratory well for Phillips Petroleum Inc. Rig was prepared for effort at Seward's Alaska Railroad dock.

LABOR EFFECTS

An examination of the changes in the size and composition of the regional employment structure may help identify the labor effects associated with the period under investigation. During the period of potential Lower Cook influence, primarily 1976 to 1979, a number of exogenous forces were influencing the economy of the Kenai/Cook Inlet Census Division, including the pipeline boom and the Collier plant expansion.

Table 45 provides a four-year summary of the Kenai-Cook Inlet Division's employment size and composition. The years 1975 through 1977 show a modest decline (seven percent) in mining employment, possibly attributable to the production decine in the Upper Cook Inlet fields. In 1978, mining employment increased by eighty-four workers, or 11.6 percent. This increase can reasonably be imputed to Lower Cook Inlet exploration activities.

Construction employment appears as the most volatile of the employment categories. Employment in this category increased by almost sixty-eight percent between 1975 and 1976 and by seventy-one percent in the following year. Construction employment increased from 630 in 1975 to 1,808 in 1977, or 187 percent. Construction was clearly the leading employment sector during this boom period. This boom was the result of two seperate influences: the pipeline construction boom and the Collier plant expansion. The former factor influenced residental construction, whereas the latter was a major industrial construction project.

During the period 1975 through 1978, total employment increased from 5,591 to 6,554, with a peak of 7,337 in 1977. The two year in-

Table 45

EMPLOYMENT
Kenai-Cook Inlet Division
(Average Monthly Employment)

	1975	1976	1977	1978
Mining	775	741	721	805
Contract Construction	630	1,057	1,808	485
Manufacturing	855	960	1,015	985
Transportation, Communication and Utilities	520	549	562	574
Trade	887	948	1,053	1,189
Finance, Insurance and Real Estate	128	157	186	197
Services	654	774	824	853
Miscellaneous	*	5[1]	7	20
Government				
Federal	83	83	77	90
State and Local	978[1]	1,093	1,063	1,324
Agriculture	81	116[1]	21	32
Total Employment	5,591	6,483	7,337	6,554

$'Information withheld to protect confidentiality of data for individual firms.

[1]Based on nine months of data only.

Source: Statistical Quarterly, Alaska Department of Labor, various issues.

crease of 1,746 workers is dominated by the fluctuation in construction employment. Construction employment accounts for almost 67.5 percent of the total increase.

The decline in construction employment was even more spectacular than its rise. Construction employment declined by 1,323 workers, or 73.2 percent, by 1978. The construction boom was clearly over. Total employment declined by 783 workers. Other sector's continued to grow, partially offsetting the decline in contract construction.

The trade, mining and state and local government sectors showed growth between 1977 and 1978. In fact, all but mining showed steady growth throughout the period, Even though manufacturing showed a slight decline between 1977 and 1978, the expansion of the Collier plant increased employment at this facility to 315 workers. This represents an additional large high wage, nonseasonal component to the manufacturing sector, adding stability to the local economy.

Table 46 presents data on aggregate wage and salary payments for the Kenai-Cook Inlet Census Division. Although the proportion of wages and salaries to total regional income is unknown (Mathematical Sciences NW estimated a ratio of wages and salaries to value added of 63.7 percent for the state in 1972), it is unlikely that the region would be experiencing economic growth if this total was declining in real terms.

The nominal or current dollar total increased from about $102 million to approximately $172 million in the 1975-1977 period. Of this increase, almost $43.5 million (or sixty percent) was generated within the construciton sector. As a result, the construction sector's share of total wage payments increased from 16.3 percent in 1975 to thirty-five

Table 46

WAGES AND SALARIES
Kenai-Cook Inlet Division
(Thousands of Dollars)

	1975	1976	1977	1978
Mining	22,182	23,272	22,692	26,531
Contract Construction	16,619	30,525	60,109	11,766
Manufacturing	12,945	17,612	20,333	20,945
Transportation, Communication and Utilities	13,021	15,235	16,593	19,751
Trade				
Wholesale	4,499	5,843	5,628	5,854
Retail	6,265	7,534	9,009	10,810
Finance, Insurance and Real Estate	1,356	1,861	2,636	2,857
Services	8,086	12,284	14,417	14,313
Miscellaneous	1,791	2,613	858	1,194
Government				
Federal	1,387	1,483	1,551	1,790[1]
State and Local	13,666	17,240	18,063	24,498
Agriculture	48	56	68	80
Total Average	101,867	135,559	171,957	140,389

[1]Includes military related federal civilian employees.

Source: Basic Economic Statistics of Alaska Census Divisions, Alaska Department of Commerce and Economic Development, November 1979.

percent in 1977. Nominal construction wage and salary income falls by $48.3 million the next year and the share of regional wage payments attributed to construction declines to 8.4 percent of the regional total. During the same period, regional wage and salary income fell by $31.6 million. Fluctuations in construction activity clearly dominated the region's economy.

If the nominal figures are adjusted by the Anchorage CPI, the boom statistics are tempered while the decline is even more precipitous. The CPI increased from 151 to 174.2 between 1975 and 1977. using these numbers as an approximat.e deflater for wage and salary income reduces the comparable nominal figures to $67.5 million in 1975 and $98.7 million in 1977. This 46.2 percent increase in real wage and salary payments is still substantial for a two-year period and indicative of a rapidly expanding regional economy. The "adjusted" decline in 1978 is approximately $75.4 million or 30.9 percent less than the peak 1977 total. By 1978, the inflation adjusted wage and salary income was only 11.7 percent above its 1975 total.

Reviewing the same data series for the Seward Census Division leaves the impression of a stable, if not somnolent, local economy. The boom reflected in the Kenai/Cook Inlet Census Division is not apparent in any of the employment related data series. The employment data in Table 47 reflect virtually no change from 1975 to 1977,

The wage and salary data in Table 48 reinforce the impression of stability or stagnation in the local economy. Nominal wages and salaries increased from approximately $16.9 million in 1975 to almost $17.6 million in 1977. This modest 4.3 percent increase compares unfavorably with the 14.9 percent increase in the Anchorage CPI for the same period.

Table 47

EMPLOYMENT
Seward Division
(Average Monthly Employment)

	1975	1976	1977	1978
Mining	*	*	*	*
Contract Construction	13	8	9	12
Manufacturing	*	*	109	*
Transportation, Communication and Utilities	*	*	*	53
Trade	148	157	176	201
Finance, Insurance and Real Estate	*	*	16	16
Services	139	152	142	164
Miscellaneous	*	27	9	11
Government				
Federal	61	59	54	71
State and Local	274	281	296	241
Agriculture	0	0	0	0
Total Employment	1,152	1,137	1,155	1,226

*Information withheld to protect confidentiality of data for individual firms.

Source: Statistical Quarterly, Alaska Department of Labor, various issues.
Growth Management Strategy, Simpson, Usher, Jones, Inc., March, 1979.

Table 48

WAGES AND SALARIES
Seward Division
(Thousands of Dollars)

	1975	1976	1977	1978
Mining	*	*	*	*
Contract Construction	204	228	*	276
Manufacturing	*	*	*	*
Transportation, Communication and Utilities	*	*	*	*
Trade				
Wholesale	0	*	*	*
Retail	1,253	1,563	1,704	1,843
Finance, Insurance and Real Estate	*	*	*	178
Services	1,069	1,266	1,504	1,646
Miscellaneous	*	731	*	*
Government				
Federal	1,085	1,069	1,120	2,535[1]
State and Local	4,714	5,244	6,004	5,418
Agriculture	0	0	0	0
Total Wages and Salaries	16,860	17,223	17,585	18,158

*Information withheld to protect confidentiality of data for individual firms.

[1]Includes military related federal civilian employment.

Source: Basic Economic Statistics of Alaska Census Divisions, Alaska Department of Commerce and Economic Development, November 1979.

Even if rents and utility prices were more stable than Anchorage's, the commodity portion of the CPI would accurately reflect Seward price increases. The commodities are interregionally traded, hence price increases would be transmitted to Seward. Therefore, wage earners must have been suffering a modest decline in real incomes. The apparent decline is illustrated in Tables 49 and 50. Nominal wages are deflated by the CPI and fall by 18,8 percent from 1975 to 1978. The decline was continuous throughout the period.

Table 49

AVERAGE ANNUAL WAGES PER WORKER
Seward Division
(Current Dollars)

	1975	1976	1977	1978
Mining	--	--	--	--
Contract Construction	15,692	28,500	--	23,000
Manufacturing	--	--	--	--
Transportation, Communication and Utilities	--	--	--	--
Trade				
Wholesale	--	--	--	--
Retail	8,466	9,955	9,682	9,169
Finance, Insurance and Real Estate	--	--	--	11,125
Services	7,691	8,329	10,591	10,036
Miscellaneous	--	27,074	--	--
Government				
Federal	17,787	18,119	20,741	15,206[1]
State and Local	17,204	18,662	20,284	22,481
Agriculture	--	--	--	--
Total Average	13,489	13,912	13,978	13,683

[1]Includes wages and salaries for military and related federal civilian employment.

Source: Situation and Prospects, January, 1980, Kenai Peninsula Borough.

Table 50

AVERAGE ANNUAL WAGES PER WORKER
Seward Division
(1967 Dollars)

	1975	1976	1977	1978
Mining	--	--	--	--
Contract Construction	10,392	17,453	--	12,346
Manufacturing	--	--	--	--
Transportation, Communication and Utilities	--	--	--	--
Trade				
Wholesale	--	--	--	--
Retail	5,607	6,096	5,558	4,922
Finance, Insurance and Real Estate	--	--	--	5,972
Services	5,093	5,100	6,082	5,387
Miscellaneous	--	16,579	--	--
Government				
Federal	11,779	11,096	11,906	8,162
State and Local	11,393	11,428	11,644	12,067
Agriculture	--	—	--	--
Total Average	8,933	8,519	8,024	7,345

MAJOR LOCAL EXPENDITURES

This section will briefly outline the magnitude and type of expenditures made by the operators and their subcontractors in Homer, Kenai and Anchorage. It is important to realize that even if accurate expenditure data were available (and they are not), the data would have to be interpreted carefully. In small regional, open economies like Homer and Kenai, gross sales and expenditure figures are poor indicators of the amount of income that is generated and accrued locally. Most commodities and many services are imported, hence gross sales revenue is siphoned off to other regions. What remains are the retail and wholesale margins associated with the sales. For example, it has been estimated that more than $5.7 million worth of diesel fuel was purchased in the Kenai area for Lower Cook Inlet operations. The primary income remaining in the region would accrue to the wholesalers and retailers of the product. This income would be measured by the wholesale and retail margins associated with the transactions. Furthermore, only the refinery payments to locally owned productive inputs could be computed as regional income resulting form the sale of the diesel fuel. If all of these factors could be totaled, the result would be much less than the $5.7 million in purchases.

Administrative employment and company allocation of overhead represents another set of problems with respect to computing income generated by the sale. Marathon's seven office employees in Anchorage assigned to the Lower Cook exploration effort may not have generated <u>additional</u> local income. If the seven were only reallocated from less pressing projects, their reassignment would represent an accounting

debit related to the sale but no change in local income. Only if the Marathon seven had been hired especially for the sale-related work or if existing employees had worked overtime because of the sale would their incomes or portions of income be sale-related local expenditures of the company. Only employment and expenditures that are/ were sale-dependent can properly count as local expenditures, However, the identification of what proportion of these expenditures remained (accrued) locally or even in Alaska would require a detailed analysis clearly beyond the scope of this project.

This report will only indicate gross expenditures, where available. If costs are not known, the activity is only described. Due to the high degree of estimation involved, incompleteness of cost data and the inability to determine where the income from gross sales actually accrued, estimated costs are not summed for the local community.

If estimates made by the operators are accurate (drilling costs of $70,000 per day, per rig), the companies have spent about $73.5 million through January 1980 in their unsuccessful efforts to find hydrocarbons in the Lower Cook Inlet. It is likely that a small percentage of this total was expended locally in Alaska. Rig rentals probably averaged $30,000 to $40,000 a day (per rig) and drilling crews and boat crews were recruited from outside the area. The following sections contain estimates of the local impacts of exploration expenditures.

Homer. Major local expenditures by the operators in Homer included the pre-drilling surveys, dockage and wharfage for supply boats, water, hangar space, wages and living space for pilots, mechanics, boat crews and expediters.

Dames and Moore estimated that their predrilling surveys cost approximately $500,000. They operated the surveys from their Homer office, leased local boats and used local employment (although a majority of the technical crews came from outside Alaska). Therefore, a significant portion of these costs likely remained in the Homer economy.

Dockage fees, paid by the supply vessels to the City of Homer, for the period came to a total of $30,000, wharfage fees to about $5,000 and water costs to about $15,000. Very little fuel was sold to supply boats in Homer. The supply boats were loaded at each docking by a privately contracted crane operator. The crane rented for $150 per hour and spent at least one hour and up to eight hours for each docking (372 total dockings).

Two helicopter hangars were leased by Arco and Air Logistics (Arco subleased to Phillips), but lease costs are confidential. Both hangars were built just prior to the lease sale by local businessmen, The largest was estimated to cost $200,000. ERA, Arco and Marathon rented housing in Homer, but the total costs are unknown. ERA has one apartment for its pilots and expediters, while Arco has two apartments - one for pilots working for Arco and the other for an expediter. Marathon had one full-time expeditor and rented living space for him, Air Logistics also rented living space for its pilots, mechanics and expeditor.

Assuming apartment space was rented for the duration of drilling, it is estimted that Marathon rented one apartment for fourteen months, ERA rented one for fifteen months and Arco rented two apartments for six months. It is also possible that the living quarters were leased for longer terms.

A small staging area (less than one acre) on the Spit was also used by the companies at an unknown cost.

Wages paid by the operators in Homer include: the crew and local biologists hired by Dames and Moore for the surveys; one full time expeditor for Marathon, one part time and one full time expediter for Arco; one locally hired full time expeditor for Air Logistics; one helicopter mechanic who stayed full time in Homer for Air Logistics, one locally hired mechanic; and another mechanic who stayed full time in Homer for ERA. In addition, eight pilots and two expediters rotated out of Homer to Anchorage for ERA and four pilots rotated from Homer to their residences for Air Logistics,

Assuming employment stayed at these levels for the duration of drilling, a total of thirty-seven expeditor man months and thirty-five helicopter mechanic man months were full time in Homer. An additional seventy helicopter pilot man months and fifteen expediter man months rotated out of Homer. Most of the full time employed Homer individuals likely spent their wages in Homer. An unknown amount of the rotated individuals' salaries remained in Homer.

Kenai. Operator expenditures in Kenai were primarily related to the purchase of consumables, dock charges, charter aircraft, stevedoring, Phillips Oil Company administration and service company administration and services.

Most of the fuel for the drilling rigs and supply boats *was* obtained in Kenai. The operators' estimates for fuel use were variable, but using an average obtained from the companies and an average retail cost (over the past nineteen months) of $.70 per gallon, the total fuel cost would be around $5.7 million for the drilling vessels and supply

vessels. The actual costs to the company, as well as the actual percentage of this cost remaining in the local economy, is unknown. Jet fuel amounts and costs are also unknown. (Jet fuel was trucked from Kenai to Homer.) Water was furnished from a private, local source and each of the six boats were charged a flat rate of $300 per month. The total amount spent is included as part of the total dock revenues below.

Mud and cement were purchased locally, but exact amounts used were confidential. Arco supplied some general figures for one well (see Table 5). These figures would indicate the approximate total expenditure of $99,000 for bentonite ($16.50 per sack), $193,000 for barite ($297. 00 per ton) and $75,600 for cement ($14,00 per sack) for that well. Seven wells have been drilled, but amounts fluctuate greatly among the wells,

Dock charges for all the supply boats using the Nikiski dock include dockage, wharf age, water and storage charges. Total amount spent was approximately equal to $180,000. In addition to these charges, an average of twelve men worked a forty-hour week at the dock loading and unloading all boat traffic. During the period of this study, the rig tender boats accounted for about one-half of the dockings, but the dock manager indicated they only accounted for about fifteen percent of total wharfage. It is not clear that any additional workers were hired because of this activity,

The majority of the fixed wing charter aircraft worked out of Kenai. Two companies were involved, one of which estimated they flew about sixty hours per month for Marathon. Both companies were under long-term contracts, which are confidential, but their hourly rates were

about $365 to $425 per hour. In addition to the long-term rates, the companies indicated that they flew spot charters for all the operators when needed, Marathon also flew their cores out in chartered aircraft. The costs and total hours for these jobs are not available.

Kenai was the headquarters for operations for Phillips Petroleum Company. They utilized office space at their Nikiski plant. Local individuals involved in Lower Cook Inlet operations included one full time drilling superintendent, plus four other individuals who spent part of their time on Lower Cook Inlet operations, Their salaries or total man hours spent were unavailable.

A number of oil field services operated out of Kenai. They included well logging companies, mud companies and cement companies. Schlumberger had the equivalent of a three man crew on call full time for two vessels and the equivalent of two men for the other, Total wages and total logging costs are unknown. One individual worked full time for Bariod Mud Company for Arco out of Kenai. A maximum of two individuals worked for Dresser for Marathon out of Kenai,

Anchorage. Major local expenditures by the operators in Anchorage primarily consisted of oil company administration and service company administration. In addition, a significant share of the local employment generated by the Lower Cook Inlet sale came out of Anchorage.

Arco has its administrative offices in Anchorage and estimated it employed two full time equivalents offshore and three full time equivalents onshore from Anchorage. Marathon indicated a total of seven full time equivalent positions from Anchorage, with two of those transferred

to Alaska for the sale. Thus, approximately twelve oil company personnel from Anchorage were involved in the sale.

Service companies with headquarters in Anchorage and who indicated they used Anchorage personnel included the diving companies who hired divers from the union hall, mud companies, mud loggers, weather observers and helicopter companies. All these companies indicated that they did not increase their administrative staff or particularly do any extra work for the Lower Cook Inlet lease sale. However, they hired a number of individuals from Anchorage to work in the field on the Lower Cook Inlet Sale. In addition, all the drilling contractors indicated that, at a minimum of twice a month, crew changes for the drilling rigs stayed overnight in Anchorage before being flown to Homer.

Government agency involvement in the Lower Cook Inlet after the sale was minimal and primarily by USGS. BLM functions only as the leasing agency, consequently, its involvement after the sale was limited to analysis of sale results and awarding of the leases. USGS, on the other hand, is responsible for the day-to-day management of the lease sale and the post lease activities. EPA involvement is limited to permit analysis and review. Estimates of personnel associated with these various agencies are shown in Table 17.

BUSINESS CYCLES/FLUCTUATIONS

A detailed analysis of the economic activity on the Kenai Peninsula to identify the probable causes of its business cycles will not be undertaken for this study. However, it is reasonable to assume that short run fluctuations in the level of economic activity were related to a number of exogenous forces influencing the region's economy. Certainly, the pipeline boom exuded influence throughout the Southcentral region, including the Kenai Peninsula. The pipeline-induced growth in Anchorage placed increasing demands on the Peninsula's recreational resources. Construction of the Collier plant addition and its subseqeunt operation affected local employment and income levels. It is likely that construction activity on the Seward Highway in 1979, by limiting access to the peninsula, had a negative influence on the region's income and employment.

A number of events occurring in later 1978 had negative implications for the economy on the Peninsula, particularly the announcement of the first dry hole in the Lower Cook Inlet, the announcement of the delay in the Pacific LNG plant construction and the decision to locate the Alpetco plant in Valdez rather than Kenai. All of these events worked to reduce the anticipation of a boom.

A number of historical data series are evaluated in an attempt to ascertain whether activities associated with the October 1977 Lower Cook Inlet lease sale exerted a measurable influence on the level of regional and/or local economic activity. It is recognized that the data series are both too aggregate and too short to clearly identify sale-related impacts. Some of the data (employment, wages, unemployment) exists

at the census division level, hence subsumes local economic effects. In addition, man y economic activities are anticipatory in nature and may occur years before the targeted event (in this case the Lower Cook sale),

Regional employment statistics give a general indication of the level of economic activity. Table 51 displays the aggregate employment data for the Kenai-Cook Inlet Census Division. These figures differ significantly from those cited previously in the Labor Effects section because they include estimates of self-employed workers in partnerships and proprietorships. This category of employment appears very sensitive to general economic conditions. Comparison of Table 51 with Table 45 in the Labor Effects section reveals that the variation in covered employment is much less than the total estimated in the aggregate series. Apparently "booms" attract a large number of workers that also act as subcontractors.

Table 51 indicates a rapid increase in employment from 1975 to 1976. The pipeline boom and the Collier construction project with their attendant direct and indirect effects probably account for most of this increase. After 1976, the series declines until 1979. The modest 'recovery occurring in 1979 coincides with peak exploratory activity in the lower Cook Inlet.

The self-employed category seems extremely sensitive to rates of growth in regional income. The rate of growth in nominal wages and salaries slowed from thirty-three percent between 1975 and 1976 to 26.8 percent the following year. Over the same period, aggregate employment increases by 27.24 percent, then declines by 8.74 percent. Covered employment still increases in 1977 by almost 13.2 percent. By 1978, both series show a decline.

Table 51

EMPLOYMENT AND LABOR FORCE
Kenai-Cook Inlet Division

Year	Civilian Labor Force	Employment	Unemployment	Unemployment Rate
1975	$,701	7,948	753	8.7
1976	11,107	10,113	994	8.9
1977	10,236	9,229	1,007	9.8
1978	9,996	8,504	1,492	14.9
1979	10,395	9,049	1,346	13.1

Source: Alaska Economic Trends, Alaska Department of Labor, various issues.

A similar comparison for the Seward Census Division (see Table 52) reveals that aggregate employment peaked in 1976. Covered employment (Table 47) was very stable, increasing from 1,152 workers in 1975 to 1,226 in 1978. Because of disclosure problems, it is not possible to ascertain which sectors absorbed this gain. Again, fluctuations in employment appear to be absorbed by the self-employed. Between 1975 and 1976, covered employment declines from 1,152 to 1,137, or fifteen workers. During the same period, aggregate employment (Table 52) increases by 470 workers. Concomitantly, the labor force increased by 561 people. Evidently, almost eighty-four percent of the new entrants were able to find employment. At the very worst, eighty-one percent of the new entrants found jobs (this assumes the fifteen covered workers all became self-employed).

Activity in the housing sector is indicative of the overall level of economic activity for several reasons. The housing or residential construction sector is an important one in the Alaskan economy. Given the underdeveloped nature of the Alaskan economy, the construction sector has captured a greater share of the economy than in the lower forty-eight states. As a result, housing activity tends to be a leader in business cycles in Alaska - an indicator of booms and busts.

Table 53 provides counts of the numbers of housing units authorized by building permits for five cities on the Kenai Peninsula between 1970 and 1979. Building permit activity peaked in 1977 in the cities of Homer, Kenai and Soldotna. The 1977 number of permits (117) for Homer represents a ninety-five percent increase over the activity in 1970. Permits dropped off in 1978 for Homer, decreasing twenty-one percent, but grew again by twenty-three percent in 1979.

Table 52

EMPLOYMENT AND LABOR FORCE
Seward Division

Year	Civilian Labor Force	Employment	Unemployment	Unemployment Rate
1975	1,272	1,156	116	9.1
1976	1,833	1,626	207	11.3
1977	1,557	1,367	190	12.2
1978	1,493	1,260	233	15.6
1979	1,511	1,341	170	11.5

Source: Alaska Economic Trends, Alaska Department of Labor, various issues.

Table 53

TOTAL HOUSING UNITS AUTHORIZED? BY BUILDING PERMITS
AND PUBLIC CONTRACTS, ANNUALLY, 1970 TO 1979

Year	Homer	Kenai	Seldovia	Seward	Soldotna
1970	6	17	1	8	11
1971	12	23	3	8	4
1972	11	22	1	39	16
1973	17	13	8	1	11
1974	35	15	7	4	37
1975	13	100	5	3	87
1976	60	161	13	11	138
1977	117	267	8	39	177
1978	92	160	9	36	69
1979	113	47	22	50	40

l'includes mobile homes, additions and conversions where reported.

Source: U.S. Department of Housing and Urban Development, HUD economist (January 16, 1980).

Similar patterns prevailed in Soldotna and Kenai. Residential building permits increased approximately 1,500 percent between 1970 and 1977 for each city. Kenai peaked with 267 permits in 1977 and Soldotna had 177 permits. This peak in housing activity corresponds to the timing of the Collier expansion. Unlike Homer, neither Kenai nor Soldotna experienced increased activity in 1979. Total permits issued in 1979 for Kenai were eighty-two percent lower than in 1977; Soldotna permit activity dropped seventy-seven percent in 1979 over 1977.

The total number of housing permits issued in Seward remained high each year from 1977 through 1979, peaking in 1979 with fifty permits. In 1977, permit activity reflected a 255 percent increase over the previous year. In Seldovia, permit levels reached highs in 1976 (thirteen permits) and 1979 (twenty-two permits). Otherwise, activity levels there remained relatively stable during the 1970's.

Another measure of economic activity in the real estate market is the assessed valuation of real property. Borough-wide, real property assessments increased by 79.5 percent between 1976 and 1977, an additional 40.7 percent in 1978 and, again, by 41.3 percent in 1979. Assuming that assessment practices were constant throughout this period, these increases must be judged as substantial. It appears that the reduction in economic activity indicated by the reduction in covered employment only had a modest effect on the rate of increase in real property assessment. The increases in 1978 and 1979 are occurring to much larger base values than in 1977, hence represent increasing absolute amounts. Even' if the latter figures are deflated by the Anchorage CPI, the real increases are on the order of 31.5 percent for 1978 and 28,34 percent in 1979.

If the focus of the discussion is shifted to local taxing districts, it is apparent that the nominal assessed values were increasing in all of the communities during the 1977-1979 time period (see Table 54). Of the larger communities, only Kenai's assessed real property values increased at a rate substantially faster than inflation after 1978.

Table 55 presents the same data deflated by the Anchorage CPI. Kenai's values are still increasing rapidly after 1978, indicating that much of the Census Division's recent employment growth is concentrated in this area. The recent expansion of the Collier chemical plant workforce to 315 full time workers would explain part of this increased valuation.

Homer's real estate market seems *to* have peaked in 1978 (just as exploration was commencing) and shows only a 1.4 percent real gain in 1979. Undoubtedly, some of the real estate demand that increased assessed valuations by 61.3 percent in real terms between 1977 and 1978 was speculative in nature, with the purchasers hoping to capitalize on the potential oil boom once a discovery was made. However, price increases were also probably related to the tourist/recreational component of Homer's economy. As Alaskan residents captured more wealth from TAPS and other oil-related employment, the demand for recreational property (on the peninsula) increased. Another aspect of increasing property values in Homer is directly related to the expansion of water and sewer service areas. Borough-wide, the real increase in assessed valuation was "only" 28.34 percent (including Homer).

The rapid rise in Homer's real estate valuations suggests that the Anchorage CPI probably understates the rate of inflation in Homer

Table 54

ASSESSED VALUATION OF REAL PROPERTY

Millions of Current Dollars
(Rounded to nearest 10^5)

Year	Land	Improvements	Total Real
		Kenai	
1977	17.9	46.0	63.9
1978	19.0	53.3	72.2
1979	25.8	73.3	99.1
		Soldotna	
1977	9.0	22.2	31.2
1978	21.9	36.7	58.6
1979	22.2	41.4	63.6
		Homer	
1977	16.6	13.5	30.1
1978	31.7	20.3	52.0
1979	32.4	25.8	58.2
		Seldovia	
1977	.7	3.8	4.6
1978	1.0	5.0	6.1
1979	1.0	5.4	6.4
		Seward	
1977	3.3	14.5	17.8
1978	7.8	18.8	26.6
1979	7.8	20.1	27.9
		Kachemak	
1977	3.2	1.4	4.5
1978	3.1	1.4	4.5
1979	3.7	2.9	6.6

Source: Situation and Prospects, January, 1980, Kenai Peninsula Borough.

Table 55

ASSESSED VALUATION OF REAL PROPERTY
Millions of 1967 Dollars
(Rounded to nearest 10^5)

Year	Land	Improvements	Total Real
		Kena i	
1977	10.3	26.4	36.7
1978	10.2	28.6	38.8
1979	12.6	35.7	48.3
		Soldotna	
1977	5.2	12.8	17.9
1978	11.8	19.7	31.5
1979	10.8	20.2	31.0
		Homer	
1977	9.5	7.8	17.3
1978	17.0	10.9	27.9
1979	15.8	12.6	28.3
		Seldovia	
1977	.7	2.2	2.6
1978	.5	2.7	3.3
1979	.5	2.6	3.1
		Seward	
1977	1.9	8.3	10.2
1978	4.2	10.1	14.0
1979	3.8	9.8	13.6
		Kachemak	
1977	1.8	.8	2.6
1978	1.7	.8	2.4
1979	1.8	1.4	3.2

Source: Situation and Prospects, January, 1980, Kenai Peninsula Borough.

during the 1977-79 historical period. The housing component of the Anchorage CPI only increased by 3.6 percent from January 1977 to January 1978 (Situation and Prospects, Kenai Peninsula Borough, January 1980), This relatively modest increase reflected the post pipeline reduction in demand for single family housing and high vacancy rates for multiple unit housing, The rapid rise in Homer's assessed valuations implies that the housing component of a locally constructed CPI may have increased at a faster rate than the Anchorage counterpart.

Given the interregional character of commodity and services trade, one would expect these prices to increase at approximately the same rate throughout the Southcentral region, Unless local utility costs were rising much slower than Anchorage's, or subsistence activities were substituted for market activities, then, as commodity prices increased, the cost of living must have been rising faster in Homer than in Anchorage. Thus , sale-related speculative demand for real property may have led to higher local inflation rates in the post sale period. This implied higher rate can be construed as a sale-related "boom" effect. That this was a speculative effect is suggested by the manner in which the increased valuations are imputed between land and improvements. The growth in assessed valuations was approximately $22 million dollars (nominal) between 1977 and 1978. Of this increase, roughly $15 million, or sixty-eight percent, was due to rising land values and only thirty-two percent to improvements. In all other communities except Kachemak (also located near the lease sale area), improvements constituted the major source of increased valuations,

Seward property values (land) showed a significant increase in 1978 over 1977, more than doubling in real terms. It was the opinion of the local residents interviewed that increased land values were probably tied more to the fact that land had been seriously underpriced for so long than to the potential impacts of the Lower Cook Inlet sale or even the Gulf of Alaska oil activity.

Finally, Table 56 presents nominal sales data for the major peninsula communities. Both Soldotna and Homer show high rates of increase, roughly 34.6 percent and 28.4 percent respectively, between 1977 and 1978. The following year indicates only moderate gains for all communities (Seldovia being the exception, with a sixty-two percent increase).

Unfortunately, the data in Table 56 are possibly misleading. The growth in nominal sales is understated. The proportion of any sale over $500 is excluded. General inflation has caused this proportion to grow over time. As a result, the ratio of taxable sales to total sales must be falling over time, systematically introducing a downward bias over time.

Table 56

SALES AND SALES TAX

Annual Taxable Sales
(Current Dollars)

Year	Kenai	Soldotna	Homer	Seldovia	Other Cities†
1977	38,846,866	20,582,650	16,556,600	1,973,300	51,393,034
1978	40,746,900	28,077,750	21,266,250	2,129,000	51,467,400
1979	40,541,498	29,330,950	24,899,450	3,445,200	52,472,552

Annual Sales Tax Revenues
(Current Dollars)

Year	Kena i	Soldotna	Homer	Seldovia	Remaining Borough†
1977	1,165,406	411,650	331,112	19,733	2,587,049
1978	1,222,407	561,555	425,325	21,290	2,873,746
1979	1,216,245	586,619	418,164	34,452	3,013,793

†Includes Seward

Source: Situation and Prospects, January, 1980, Kenai Peninsula Borough.

Note: Data do not reflect total retail sales activity. Not included are tax exempt sales and services and the portion of each sales transaction over $500.

COMMUNITY ATTITUDES

The reactions of the various communities on the Kenai Peninsula to the Lower Cook Inlet lease sale were surprisingly consistent. Generally speaking, each community has been described as originally being rather evenly "split" between positive and negative reactions. This dichotomy was most pronounced in Homer and Seldovia, where the benefits and negative aspects were likely to be more pronounced. Primarily, the difference in attitudes arose from the difference in expectations of the impacts the Lower Cook Inlet lease sale would have on livelihoods: those with major investments in fishing were concerned that oil activity could damage the fishing industry; wage earners looked forward to lower Cook Inlet activities in hopes of capturing employment. Over time, the overall attitude has become more positive. It is difficult to ascertain the exact reasons for this shift, though it appears to be a function of several things: 1) negotiations between fishermen and oil companies have resulted in successful compromises (Crab gear was apparently lost due to interference by the supply boats. Agreements on specific shipping lanes seems to have solved the problems.); 2) no oil has been discovered and, therefore, impacts have been minimal; and 3) the oil companies made concerted efforts to mitigate impacts, including the use of educational and informational programs for the public.

Other feelings and impressions about the Lower Cook Inlet lease sale varied somewhat among the communities. Local residents of Seldovia expressed interest in employment opportunities which might arise from the oil activity in the Inlet; however, they would want to choose the timing and extent of their employment. It is important to

them to be able to retain certain freedoms in their lifestyles, including the freedom to fish. If oil were to be discovered, Seldovia would like to become the site for processing and handling the oil. The community feels its location is ideal for this phase of development, primarily because it minimizes the opportunities for damage to their fishing areas. To the extent that tanker traffic through the prime fishing areas can be avoided, Seldovia would advocate location of processing facilities on their shore.

In Homer, the early environmental concerns have apparently waned. There is significantly less public concern now, though it is difficult to identify exact reasons for the change. Most likely it follows the three reasons given above, in addition to the fact that certain people felt that their concerns would continue to be ignored,

Kenai residents maintained a favorable attitude about the Lower Cook Inlet lease sale almost from the beginning. While the fishermen negotiated with the oil companies to protect the fishing areas and fishing gear, they were, apparently, never interested in preventing oil exploration or development, only in assuring compatibility. The fishermen recognized the benefits to the community from oil-related activities and worked toward a harmonious existence with oil companies.

Kenai was also better prepared for oil related activities than were the other cities on the peninsula. For this reason, the potentials associated with the Lower Cook Inlet were less foreboding than they may have been for other communities. One negative aspect has surfaced, however. Residents in the Kenai area have some bitter feelings about the handling of lease sale revenues. The sentiment is that the communities most affected (or most likely to be affected) by the results of an

OCS lease sale should capture more of the benefits from sale revenues. In particular, the community feels state expenditures (particularly capital improvements projects) should be increased to sale-affected communities.

Soldotna residents expect to benefit from whatever development occurs elsewhere on the peninsula. Because of its location, Soldotna is in a particularly good position to capitalize on economic expansion in either Homer or Kenai. Even so, the community apparently has more positive feelings about Lower Cook Inlet development than, for example, the Alpetco project. This is because the community envisions more certain and more stable impacts from oil exploration/development than from a project like Alpetco. Oil and gas is a proven commodity. Therefore, they have confidence in the success (and subsequent community benefits). Alpetco and similar projects are viewed as more uncertain, likely to create a boom effect because of the construction component, but not clearly beneficial in the long-run.

The attitudes of the communities of English Bay and Port Graham were mixed. As in Homer and Seldovia, negative attitudes arose from concerns regarding impacts on the fishing industry, as well as on the existing lifestyle. Some interest was expressed concerning various benefits which might arise from development. To some degree, attitudes vacillated between the two communities. One reaction seems consistent among all of the fishing communities (i.e. , Homer, Seldovia, Port Graham, English Bay and Kenai): the presence of drill ships and supply boats in the Lower Cook Inlet has improved the safety of the fishermen through improved, more current weather reports, as ‘well as from rescue efforts.

Chapter IV

I? INDINGS

1. Alaskans constituted thirty-three percent of the workforce associated with Lower Cook Inlet leasing activities. Many were in administrative positions with the operating companies or in technical positions with service companies and spent only a portion of their time on Lower Cook Inlet activities. Consequently, the proportion of total man-months contributed by Alaskans to Lower Cook Inlet efforts was only twenty-five percent.
2. Although Kenai was the major shore base for Lower Cook Inlet activity, very few adverse impacts were documented for the area. Furthermore, the sale generated little or no controversy in the city. This is undoubtedly due to the already existing infrastructure and basic familiarity of Kenai residents with the oil industry as a whole.
3. While pre-sale expectations and activities apparently generated considerable interest and contrivers y in Homer, the unanimous concensus of the individuals interviewed indicated very little social or economic impacts from the actual sale activity. The statistics back up these conclusions,
4. Most of the Alaskans employed as a result of the Lower Cook Inlet sale came from Anchorage (ninety-one workers). These individuals were primarily associated with the operating and service companies or involved in regulatory and permitting activities.
5. The data collected indicate no activity by the operators or their subcontractors in Port Graham or English Bay, The only activity in Seldovia was use of the dock for a short period during the biological and geohazards surveys. Activity in Seward was limited to

sporadic use of the dock for shipments of tubular goods and mud to Kenai.

6. In Homer, the primary areas of impact involved use of the city dock and airport. The dock was capable of handling the increased traffic. Two new helicopter hangars were built at the airport, each primarily in response to the sale activity. There were also incidents involving loss of fishing gear in Kachemak Bay early in the drilling period. This impact was minimized during the summer of 1979 by delineating traffic lanes for the supply vessels.

7 The modified Delphi technique used in this study has proven to be an excellent tool for verifying social and economic data and for obtaining the best possible information where little data exists.

8. The two major problems associated with the regulatory process from the operators viewpoint were: 1) the requirements to commit to a drilling vessel and bring it to Alaska before the vessel discharge system was certified by the EPA; and 2) the timing of the permit process. In order to begin drilling as soon as possible after October 1977, permitting requirements, such as the biological and geohazards surveys, had to be conducted during the winter. Due to weather and other problems, most of these surveys were not begun until spring of 1978. Marathon, which attempted to satisfy the permitting requirements during the winter, was still not able to spud its first well until mid-July of 1978.

9. Pre- sale expectations may have caused more significant impacts, particularly in Homer, than the post-sale events associated with this exploration only case. These pre-sale impacts were not specifically analyzed in this study.

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Appendix A

EXAMPLES OF LEASE STIPULATIONS AND REQUIREMENTS FOR PERMIT TO DRILL FROM THE UNITED STATES GEOLOGICAL SURVEY FOR THE LOWER COOK INLET LEASE SALE C.I.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Example of
Stipulations for Oil & Gas Lease Sale #CI
Outer Continental Shelf
Alaska

OCS _____

BLOCK NO. _____

Stipulation No. 1

If the Supervisor, having reason to believe that a site, structure or object of historical or archaeological significance hereinafter referred to as "cultural resource," may exist in the lease area, gives the lessee written notice that the lessor is invoking the provisions of this stipulation, the lessee shall upon receipt of such notice comple with the following requirements:

Prior to any drilling activity or the construction of placement of any structure for exploration or development on the lease, including but not limited to, well drilling and pipeline and platform placement, hereinafter in this stipulation referred to as "operation," the lessee shall conduct remote sensing surveys to determine the potential existence of any cultural resource that may be affected by such operations. All data produced by such remote sensing surveys as well as other pertinent natural and cultural environmental data shall be examined by a qualified marine survey archeologist to determine if indications are present suggesting the existence of a cultural resource that may be adversely affected by any lease operation. A report of this survey and assessment prepared by the marine survey archaeologist shall be submitted by the lessee to the Supervisor and to the Manager, Bureau of Land Management (BLM) Outer Continental Shelf (OCS) office for review.

If such cultural resource indicators are present the lessee shall: (1) locate the site of such operation so as not to adversely affect the identified location; or (2) establish, to the satisfaction of the Supervisor, on the basis of further archaeological investigation conducted by a qualified marine survey archaeologist or underwater archaeologist using such survey equipment and techniques as deemed necessary by the Supervisor, either that such equipment will not adversely affect the location identified or that the potential cultural resource suggeted by the occurrence of the indicators does not exist.

A report of this investigation prepared by the marine survey archaeologist or underwater archaeologist shall be submitted to the Supervisor and the Manager, BLM OCS office for their review. Should the Supervisor determine that the existence of a cultural

resource which may be adversely affected by such operation is sufficiently established to warrant protection, the lessee shall take no action that may result in an adverse effect on such cultural resource until the Supervisor has given direction as to its disposition.

The lessee agrees that if any site, structure, or object of historical or archaeological significance should be discovered during the conduct of any operations on the leased area, he shall report immediately such findings to the Supervisor, and make every reasonable effort to preserve and protect the cultural resource from damage until the Supervisor has given directions as to its disposition.

Stipulation No. 2

If the Supervisor, having reason to believe that an area of special biological significance may exist in the lease area, gives the lessee written notice that the lessor is invoking the provisions of this stipulation, the lessee shall upon receipt of such notice comply with the following requirements:

Prior to any drilling activity or the construction or placement of any structure for exploration or development of lease areas including, but not limited to, well drilling and pipeline and platform placement, hereinafter in this stipulation referred to as 'operation," the lessee shall conduct block-wide or site-specific surveys, as approved by the Supervisor, to determine if the block or site contains special biological communities that may be adversely affected by any lease operatin. If the surveys indicate the existence of such communities, the lessee shall: (1) establish, to the satisfaction of the Supervisor, that such operation will not have a significant adverse effect on the community identified; or (2) modify his operating procedure to minimize the impact of the operation on the biological community. Such modification could include relocation of the drilling site.

All data obtained in the course of any biological surveys conducted pursuant to the provisions hereof shall be submitted in a report to the Supervisor prior to or with any application by the lessee for drilling or other activity with a copy to the Manager, Alaska OCS Office. Should the Supervisor determine that the existence of a biological resource which may be adversely affected by such operation exist, the lessee shall take no action that may result in any adverse effect on such resource until the Supervisor has given the lessee directions with respect to the resource.

The lessee agrees that, if any communities of special biological significance should be discovered during the conduct of any operations on the leased area, he shall report such findings to the Supervisor, and make every reasonable effort to preserve and protect the resource from damage until the Supervisor has given the lessee directions with respect to the resource.

Stipulation No. 3

The lessee shall include in his exploration and development plans submitted under 30 CFR 250.34 a proposed environmental training program for all personnel involved in exploration or development activities (including personnel of the lessee's contractors and subcontractors) for review and approval by the Supervisor pursuant to this stipulation. The program shall be designed to inform each person working on the project of specific types of environmental, social and cultural concerns which relate to the individual's job. The program shall be formulated and implemented by qualified instructors experienced in each pertinent field of study and shall employ effective methods to ensure that personnel understand and use techniques necessary to preserve archaeological, geological and biological resources. The program shall also be designed to increase the sensitivity and understanding of personnel to community values, customs and lifestyles in areas in which such personnel will be operating.

The lessee shall also submit for review and approval a continuing technical environmental briefing program for supervisory and managerial personnel of the lessee and its agents, contractors and subcontractors.

Stipulation No. 4

The lessee must describe in the development plan the proposed method of transportation of production. If the proposed method of transportation would significantly affect the quality of the human environment and the method was not discussed in the Final Cook Inlet Environmental Impact Statement (published in December 1976), a decision on whether to approve the development plan will not be made until the original environmental impact statement is supplemented or a new environmental impact statement is completed on the proposal.

The lessor reserves the right to determine the method of transportation of production, but his decision will be made within the context of a planning program for assessment and management of transportation of OCS oil and gas with the participation of federal, state and local government and the industry. The lessor specifically reserves the right to require that any pipeline used for transporting production to shore be placed in certain management areas. Where it is determined by the lessor to be environmentally, technologically and economically appropriate, all pipelines, including flow lines and gathering lines for oil and gas, shall be buried to a depth suitable for adequate protection from water currents, sand waves, storm scouring, fisheries trawling gear and other uses as determined on a case-by-case basis. Barging of production may be permitted only in case of emergency or under special circumstances as determined by the Supervisor.

Stipulation No. 5

To reduce the impacts of human disturbance (i.e., aircraft and vessel traffic) at major seabird colonies and marine mamma 1 rookeries, boats will be routed to stay at least one-half mile from all colonies and rookeries from May 1 to September 15. In addition, during this period, fixed-wing and rotary aircraft must maintain a one-half mile horizontal and 2,500 foot vertical distance from seabird colonies and marine mammal rookeries. The list and geographical locations of major seabird colonies and marine mammal rookeries will be available from the Manager, Alaska OCS Office. The location of any major colonies or rookeries discovered in the e will be submitted to the Manager, Alaska Office, for addition to the present list. Human safety will at all times take precedence over the provisions of this stipulation.

Stipulation No. 6

No underwater blasting which involves the use of high velocity explosives may be conducted on any leasehold unless:

(a) the Supervisor determines that such plasting is necessary to protect human safety, fishing equipment or navigation;
(b) the Supervisor determines that the failure to permit such blasting will result in greater environmental harm and economic costs than the blasting itself; or
(c) the Supervisor determines that such blasting will not pose a risk of significant damage to marine life.

As used in this stipulation, "high velocity explosives" includes any explosive with a burning rate greater than 5,000 fps or creating a pressure curve with a sharp spike and a rise time of less than 0.18 milliseconds.

Stipulation No. 7

To assist coastal communities in planning for the impact of activities during exploration under this lease, the lessee shall submit, for review and comment, to the Governor of the State of Alaska and to local jurisdictions that will be directly affect by those activities, a "Notice of Support Activity for the Exploration Program" (called hereafter in this stipulation "Notice"). When the lessee has doubts as to which local jurisdictions shall be informed, he will be guided by the advice of the Supervisor. The lessee shall not be required to include privileged information in the Notice. A lessee shall have discretion whether to submit a separate Notice in connection with each Exploration Plan submitted under 30 CFR 250.34 on a lease or to submit a Notice in connection with two or more Plans on one or more leases. The Notice shall not be subject to approval or disapproval by the Supervisor.

A copy of the Notice shall be submitted to the Supervisor simultaneously with, or prior to, the Exploration Plan with a certification that it has been submitted to the Governor of the State of Alaska and to the local jurisdictions that will be directly

affected by activities under the Plan. If the lessee shall submit a Notice in connection with two or more Exploration Plans, he shall not be required to submit additional copies of the Notice, but may instead refer to that previous submission. Before the Supervisor approves or disapproves the Exploration Plan, he shall allow at least 30 days from the date of receipt of the certification for the Governor and local jurisdictions to submit comments on the Notice to him as well as to the lessee. Subsequent to the submission of the certification, significant changes in estimated support activities will be forwarded by the lessee, as an amendment to the Notice, to the Supervisor, the Governor, and to the local jurisdiction that will be directly affected by the program.

The Notice shall include with respect to the lessee and his contractors:

(1) A description of the facilities, including site and size, that may be constructed, leased, rented or otherwise procured in affected areas;
(2) The location and amount of acreage required within the state for facilities, including the need for storage of various supplies;
(3) An estimate of the frequency of boat and aircraft departures and arrivals, on a monthly basis, and the onshore location of terminals;
(4) The approximate number of persons who are expected to be engaged in onshore support activities and transportation, the approximate number of local personnel who are expected to be employed for or in support of the exploration program, and the approximate total number of persons who are expected to be employed for the exploration program;
(5) Estimates of the approximate addition to the population of the local jurisdiction because of the exploration program and the approximate number of persons needing housing and other facilities;
(6) An estimate of any significant quantity of major supplies and equipment to be procured within the state; and
(7) The onshore addreses of the lessee's operation offices and of the offices of contractors involved with the exploratory operation.

Stipulation No. 8

Unless the lessee can demonstrate to the satisfaction of the Supervisor that it would not be in the interests of conservation, all reservoirs underlying this lease which extend into one or more other leases, as indicated by drilling and other information, shall be operated and produced only under a unit agreement including the other lease(s) and approved by the Supervisor. Such a unit agreement shall provide for the fair and equitable allocation of production and costs. The Supervisor shall prescribe the method of allocating production and costs in the event operators are unable to agree on a method acceptable to him.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
CONSERVATION DIVISION
ALASKA AREA OCS OPERATIONS

Example of
Conditions of Approval to Drill for Oil and Gas

1. The casing, cementing, blowout prevention and mud programs shall comply with the minimum requirements outlined in OCS Order No. 2, unless otherwise established by field drilling rules. In the event the well is plugged and abandoned, the work will be conducted in accordance with OCS Order No. 3.

2. A daily chronological drilling and progress report (one copy, no prescribed form) must be submitted to the OCS District Supervisor, Alaska Area, P.O. Box 259, Anchorage, Alaska 99510 (or by telephone, if perferable to the operator). This report shall commence with the spud date and shall include drilling depth, mud weight and principal items of work done during the previous day (running casing, testing, coring, sidewall sampling, logging, etc., and including zones of abnormal pressure, lost circulation, depth of kicks, or other hole difficulties encountered which caused cessation of operations or modification of the approved drilling plan). This report must be continued until the final status of the well is established (shut in or producing oil or gas well, temporarily abandoned, suspended, etc.).

3. The applicable reports and logs required under 30 CFR 250,38 and 250.90 through 250.95 of the OCS operating regulations will be properly and timely submitted. One copy of all field prints of individual runs of all well logs (electrical, radioactive, directional, etc.) must be submitted as soon as available, but no later than 30 days after running of the logs. Two copies (1 blueline and 1 sepia) of all the final logs must be submitted as soon as available. The completion report, Form 9-330, in duplicate, must be submitted no later than 30 days after completion of the approved work. Public information copies, Form 9-330, shall be submitted pursuant to OCS Order No. 12. The above submittals should be made to the OCS District Supervisor at the address shown on Paragraph 2 above.

4. All changes to the approved submitted plan, plans for suspension of operations, plugging or plug back, should be filed in a written notification of such intent and approval from the District Supervisor should be received prior to implementing these changes. Form 9-331, in triplicate plus the public information copy, "Sundry Notices and Reports on Wells," will be used for this written notification. Emergency approval may be obtained verbally, but such approval does not waive the written notice requirement.

   The same Form 9-331 shall also be used by the operator for filing a subsequent report with details of the completed operation.

5. To accomplish the purpose of 30 CFR 250.38, 250.95 and other pertinent regulations, all occurrences of oil, gas, sulphur and other minerals of potential geological interest will be noted on the completion report or on a marked electric log to include all important zones of porosity and contents thereof, cored intervals, and complete details on all drillstem or formation tests. Exact copies of any analysis of *cores* must be submitted.

   The identify of rock units in time-stratigraphic terms will be established by showing, as accurately as the present state of knowledge allows, the depths to the top of the upper Pliocene, middle Pliocene, lower Pliocene, upper Miocene, middle Miocene, etc., on the completion report or on a marked electric log. At the discretion of the Area Office, a palaeontological identification of all forminifera and nannoplankton by depth shall be reported to the Area Office; or washed and unwashed well samples normally maintained for palaeontological determinations, shall be furnished to the Area Office.

6. The disposal of waste materials from this drilling operation must be in compliance with Gulf of Alaska OCS Order No. 7.

7. Before completion, suspension or abandonment procedures area commenced, the District Supervisor shall be given sufficient lead time to examine well records and give approval of the proposed disposition of the well. Any request for approval of completion, suspension or abandonment ❑ust include a drilling mud disposal plan which meets the objectives of Gulf of Alaska OCS Order No. 7 part 1.A(2). At the present time, mud disposal in the Lower Cook Inlet will be limited to 30 bbls per hour with a dilution ratio of 25 (sea water) to 1 (mud), between March 15 and September 1. Between September 1 and March 15, no maximum discharge will be imposed, but the discharge mut be diluted 4 to 1. This maximum rate and dilution ratio are imposed because of the concerns of the Alaska Department of Fish and Game, National Marine Fisheries Service and U.S. Fish and Wildlife Service. These limitation will be enforced until there are studies or information to disprove this concern.

8. Representative cuts (washed) of all ditch samples and cores shall be collected for the U.S. Geological Survey. Ship samples *to:* Area Geologist, USGS, 800 "A" Street, Anchorage, Alaska 99501.

9. An Environmental Training Program for all personnel involved in exploration or development on site shall be implemented pursuant to Lower Cook Inlet lease stipulation No. 5. All personnel shall include contractors and subcontractors. A report of personnel trained will be maintained at the drillsite.

Office and mailing addresses

Offshore District Supervisor, Alaska Area
Conservation Division
U.S. Geological Survey
800 "A" Street
Anchorage, Alaska 99501

Area Geologist
U.S. Geological Survey
800 "A" Street
Anchorage, Alaska 99501
(Samples and core cuts only)

Telephones:	Oil and Gas Supervisor	271-4303
	Offshore District	271-4348

Answering service for nights and weekends 271-4303