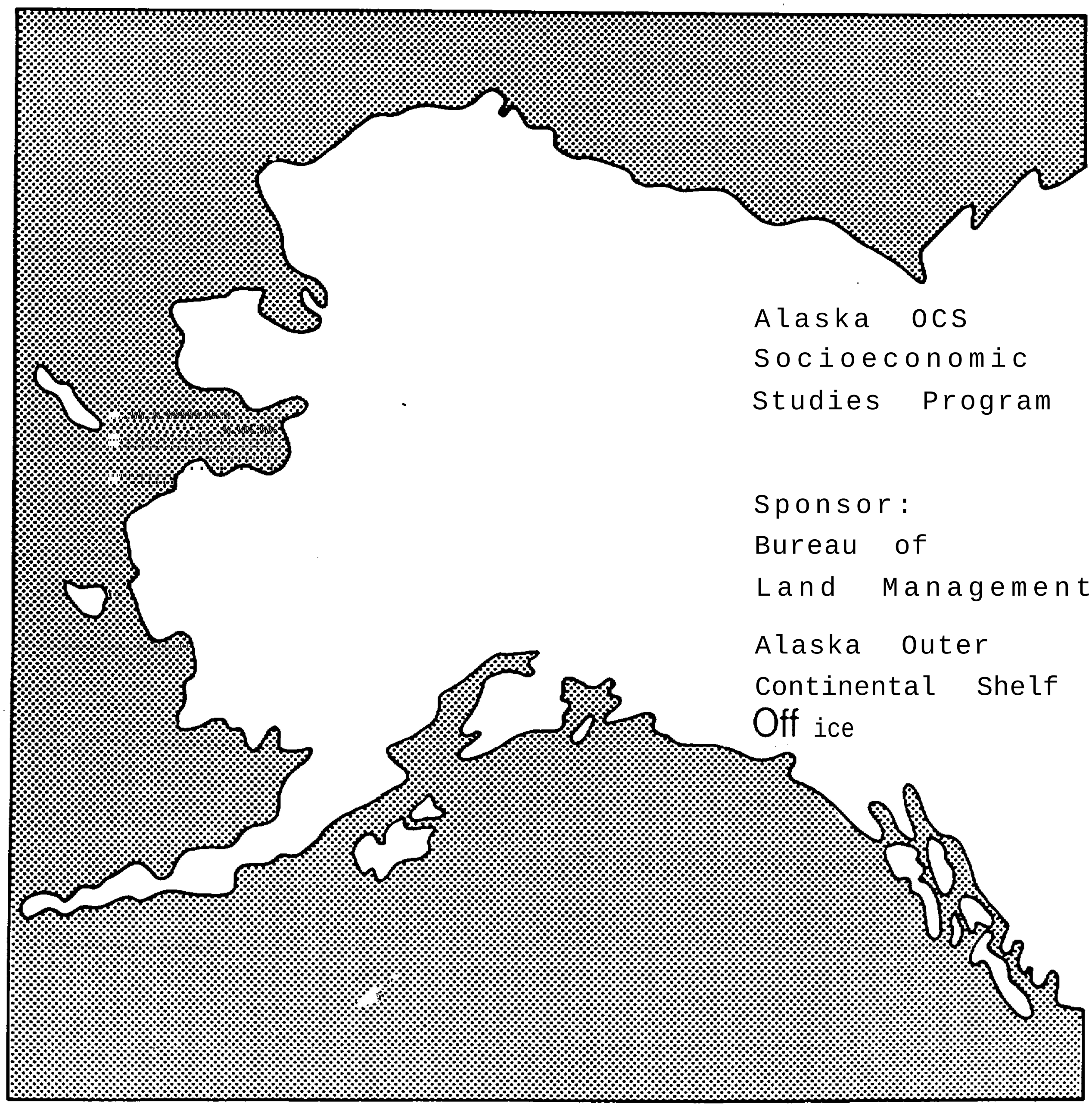
SE-AK-80

Technical Report
Number 46 Volume 2



Alaska OCS
Socioeconomic
Studies Program

Sponsor:
Bureau of
Land Management

Alaska Outer
Continental Shelf
Office

Lower Cook Inlet
Petroleum Development Scenarios
Local Socioeconomic Systems Analysis

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.

Technical Report No. 46
Volume 2 of 2 Volumes

Contract No. AA550-CT6-61

Alaska OCS Socioeconomic Studies Program

LOWER COOK INLET
PETROLEUM DEVELOPMENT SCENARIOS
LOCAL SOCIOECONOMIC SYSTEMS ANALYSIS

Prepared for

Bureau of Land Management

Alaska Outer Continental Shelf Office

March 1980

NOTICE

Alaska OCS Socioeconomic Studies Program
Lower Cook Inlet
Petroleum Development Scenarios
Local Socioeconomic Systems Analysis
Volume 2 of 2 Volumes

Prepared by
Alaska Consultants, Inc. for Peat, Marwick, Mitchell & Co.

VOLUME TWO

TABLE OF CONTENTS

Page

Page

Page

Page

VOLUME TWO

LIST OF TABLES

Page

Page

Page

Page

Page

Page

Page

APPENDICES

VOLUME TWO

LIST OF FIGURES

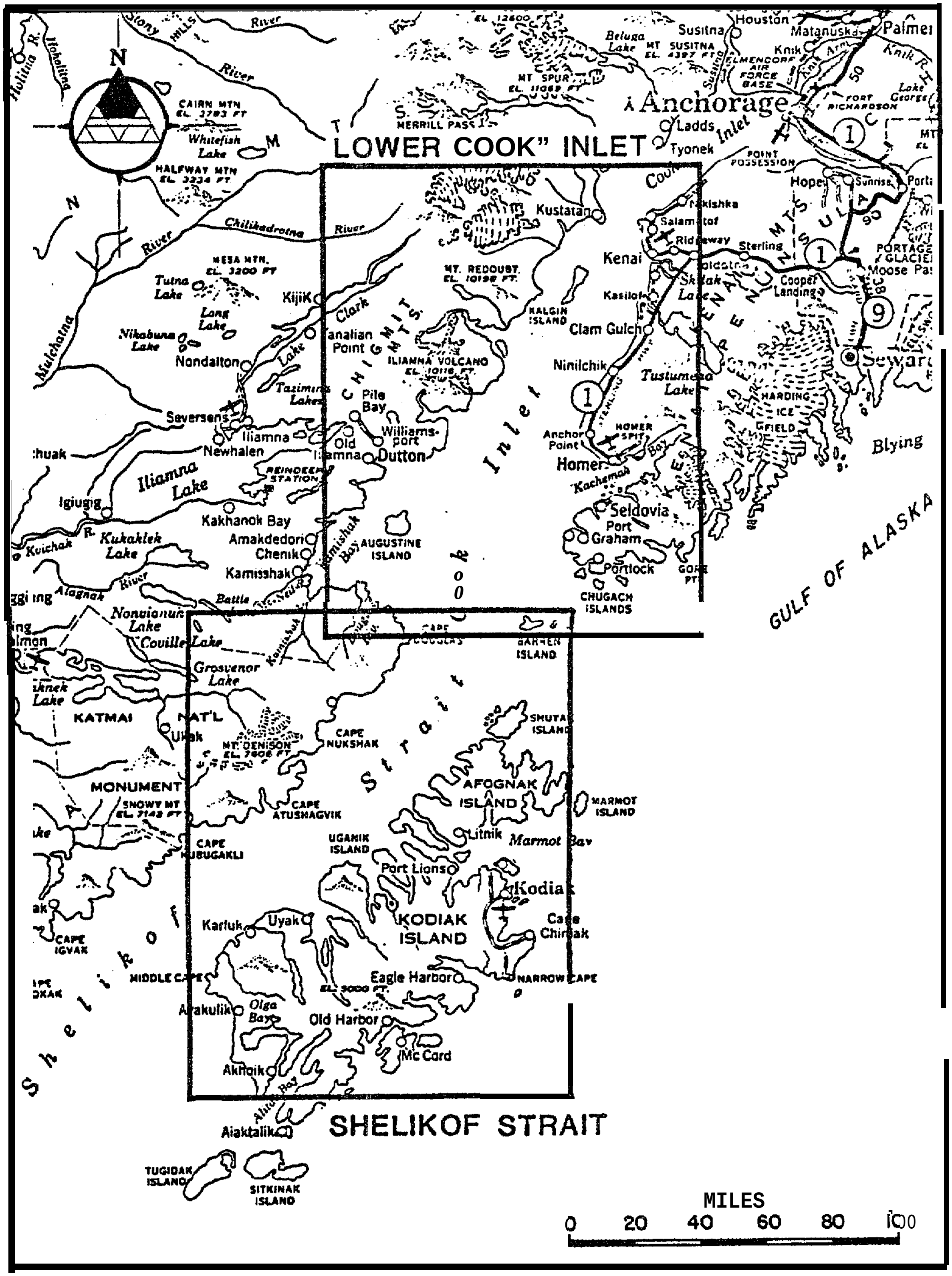
INTRODUCTION

Volume One of the "Final Technical Report, Lower Cook Inlet Socioeconomic Systems Impact Analysis" presented detailed baseline data about existing community conditions at Kenai, Soldotna and Homer. The objective of this Volume Two is to analyze how the growth and community infrastructure of these settlements might be affected as a consequence of the proposed Lower Cook Inlet OCS Lease Sale #60. This is a second-generation federal OCS lease sale in Cook Inlet, following upon OCS Sale CI held in October, 1977. Figure 1 illustrates the general location of the petroleum basins containing the tracts being considered for Sale #60.

In order to assess the range of possible community impacts of the proposed lease sale over two decades, the scenario method was used to construct and compare four different growth cases, a base case without the Lower Cook Inlet Lease Sale #60 and three distinct petroleum development cases.

To identify the significant community impacts of the different petroleum scenarios, this logical sequence of analyses was followed, proceeding from the baseline data published in Volume One:

- First, using techniques of economic base analysis and employment and population multipliers, local forecasts of future annual employment by economic sector and of future population were prepared for the base case and for each of three OCS petroleum



Source: Dames & Moore.

FIGURE 1

LOCATION Of- THE STUDY AREA

development scenarios. These scenarios were prescribed by Dames and Moore, based on oil and gas reserves estimates supplied by the U.S. Geological Survey. The specific forecasts of OCS-related employment used in the present study, from which indirect employment and future population estimates were derived, were adopted directly from Dames and Moore's petroleum scenarios.

- Second, a set of uniform standards and assumptions was developed for forecasting. For a given population, future public service and facility requirements and local governmental revenues and expenditures to facilitate comparisons among the different communities and alternative scenarios were developed.

- Finally, the standards and assumptions were used to quantify population-related community impacts of the various scenarios for purposes of comparative analysis.

As background for the analysis of the different scenarios, a brief explanation of the role of scenarios and the forecast methodology is provided below. A fuller explanation of the forecast methodology is given in the Appendices to this report.

Petroleum Development Scenarios

The outcome of the search for oil and gas is by nature highly speculative and it is thus impossible to advance any definitive single forecast about the community development impacts of a particular OCS lease sale. At the time of the lease sale and, indeed, for some years after, resource estimates and corporate decisions about development schedules and production facilities must be considered tentative, pending decisive exploration results and economic analyses.

Still, even preliminary and pre-lease resource data can be used statistically to calculate the likelihood of various recoverable reserve estimates. These different estimates, coupled with insight into the critical factors governing petroleum development decisions and operations, can be used to hypothesize forecasts or scenarios of how petroleum development might unfold in accord with one or another of the reserve estimates. Finally, the petroleum development scenarios provide a basis for constructing coherent, plausible accounts of potential socioeconomic impacts upon nearby communities of the proposed OCS lease sale to match the different assumptions about ultimate reserves and development decisions

This report characterizes the socioeconomic impacts on Kenai, Soldotna and Homer of a base case and of three different OCS petroleum development scenarios:

- Base Case. This is a forecast of how the settlements would most likely evolve were there no second Lower Cook Inlet OCS lease sale. It is the basis for comparison with the OCS scenarios.

- 95 Percent Probability Resource Level Scenario. This is the low or exploration only scenario, corresponding to that volume of "recoverable resources low enough to have a 95 percent probability of being realized. Under reasonable economic assumptions, the 95 percent resource level is not commercially profitable and is thus not produced.

- 5 Percent Probability Resource Level Scenario. This is the high scenario, corresponding to that volume of recoverable resources high enough to have only a 5 percent probability of being realized.

- Mean Probability Resource Level Scenario. This is a statistical mean scenario which is a mean of the high and low scenarios.

Detailed petroleum development scenarios for the Lower Cook Inlet Lease Sale were prepared for the Alaska OCS Office by Dames and Moore, based on oil and gas reserve estimates supplied by the U.S. Geological Survey. Table 1 lists the chief OCS-related industrial facilities and activities and associated employment assigned by Dames and Moore to onshore sites under each of these three petroleum scenarios. Local community impacts

TABLE 1

MAJOR ONSHORE FACILITIES AND ACTIVITIES
BY SCENARIO AND PHASE
LOWER COOK INLET SALE #60
KENAI AREA, HOMER AREA AND AFOGNAK ISLAND

	Kenai Area	Homer Area	Afognak Island
95 Percent Scenario			
1. Exploration only	Service base operation	Air support, service base operation	Not Applicable
Mean Scenario			
1. Exploration	Service base operation	Air support, service base operation	Service base construction
2. Development	Expanded service base operation, pipe-coating	Air support, expanded service base operation	Service base operation, oil terminal construction
3. Production	Service base operation, extended use of existing Nikiski oil facilities	Not Applicable	Service base operation, oil terminal operation (192,000 bpd, 32 jobs)
5 Percent Scenario			
1. Exploration	Service base operation	Air support, service base operation	Service base construction
2. Development	Expanded service base, operation, pipe-coating	Air support, expanded service base operation, onshore pipeline construction	Service base operation, oil terminal construction
3. Production	Service base operation, extended use of existing Nikiski oil facilities	Not Applicable	Service base operation, oil terminal operation (384,000 bpd, 84 jobs)

Source: Alaska Consultants, Inc. Derived from facility and OCS employment scenarios prepared by Dames and Moore.

for the most part stem from the construction, operation and staffing of these facilities. Thus, the validity of the socioeconomic scenarios necessarily depends on the realism of the petroleum scenarios. Most critical in this respect are the Dames and Moore workforce figures for construction camp and oil terminal operations, since they involve the largest share of employment.

The base or non-sale case describes the likely course of community growth, assuming a continuation of current economic trends, that is, without any further OCS-related economic activities. For the base case, a full analysis of community growth needs was prepared, focusing on the critical elements of community infrastructure: housing and residential land supply; public utilities (water supply; sewage systems; electric power; solid waste disposal; telephone); public safety; health and social services; education and recreation. Emphasis was given to those services and facility needs customarily provided by local government. A forecast was also prepared for the fiscal impact of growth on local governmental revenues and expenditures.

The base case forecasts and analyses were then used as the benchmark for assessing the incremental significance of the impact forecasts prepared for each of the three OCS cases. The analyses of the petroleum scenarios stress the noteworthy departures from base case conditions.

Methods of Forecasting

EMPLOYMENT AND POPULATION

The method employed to forecast future employment and population was the economic base method, outlined in detail in the Appendices to this report. Briefly explained, this method divides all local economic activities into two categories: exporting or basic industries which bring money into the locality by exporting locally produced goods and services; and non-exporting or service industries which produce goods and services for local consumption. Then, current employment is tabulated by economic sector and grouped as basic or service employment. Next, the recent trends and future prospects for each basic economic sector are analyzed and future levels of basic employment are forecast for each year. Finally, suitable ratios or multipliers relating basic employment to service or indirect employment are applied to basic employment projections to yield overall employment forecasts by sector. The suitable ratios vary from locality to locality, depending upon specific features of the local economy.

The employment forecasts are then used to project future population by applying an appropriate ratio of local employment to local population. The ratio proper to a given locality can be derived empirically, with adjustments as needed to account for any future factors that might alter it. This employment/population ratio will vary with the social composition of the local population, particularly with its age structure and labor force participation rate, and with the vitality of the local economy.

The local employment forecasts for the base case were derived in a straightforward way from existing economic data. However, the calculation of total local employment forecasts for the OCS scenarios was more complicated.

The petroleum development scenarios prepared by Dames and Moore summarize at a regional level the basic employment for a whole array of offshore industries. However, this regional summary was not immediately usable for community level forecasts. A number of intermediate steps was required to obtain community. employment forecasts:

- First, regional OCS employment was disaggregated and jobs were assigned to Kenai, Soldotna or Homer.

- Second, certain unusual traits of the workforce in the offshore industries were examined in order to interpret the numerical data in terms meaningful for economic base analysis. For example, among other factors, account was taken of personnel rotation policies, shift lengths, seasonality, round-the-clock operations, worker turnover and transiency, resident hire, and community/construction camp residency patterns as these factors affect different job categories, before an assessment was made of the quantitative impact of regional OCS-related employment on a given locale's overall employment, population and community infrastructure. The special assumptions and methods adopted herein to disaggregate and allocate OCS-related employment and the step-by-step results are recounted in the Appendices to this report.

- Third, to calculate indirect employment a series of assumptions was made assigning appropriate employment multipliers to different basic job categories.

- Fourth, the total indirect employment was distributed to various economic sectors in a proportion selected as descriptive of the economic structure toward which the relatively immature economies of Alaska's smaller coastal communities would tend under the economic stimulus of OCS industries.

The end product of these operations was a series of annual employment forecasts by economic sector for each locality for each OCS scenario, and a parallel population forecast.

COMMUNITY INFRASTRUCTURE AND FINANCES

A set of uniform standards was developed for forecasting local public facility and service demands and local revenues and expenditures, usually on a per capita basis. Quantitative standards were developed for the following items of community infrastructure: housing demand by type of unit; residential land use; water system capacity; domestic sewage treatment capacity; electric generating capacity; disposable solid wastes; telephone system capacity; police officers; jail facilities;

fire stations; hospitals; school enrollment and classroom needs; and recreational facilities.

The utility requirements of specific OCS industrial facilities such as service bases, pipe coating yards, construction camps and oil and LNG terminals, were estimated separately from community needs. Depending on the scenario and locality, various of these facilities may be wholly isolated from the settlement, or connected by road or in close proximity to the settled area. As a rule, it was presumed that large industrial enterprises would develop their own primary or backup utility systems, because they would find it more timely, economical and reliable to do so whenever existing excess local capacity was not readily available for their use. In those scenarios where industrial utilities may be a pertinent community development issue, their impact on community utility systems is evaluated.

These standards were then applied to the population forecasts to generate for each community its forecast of public service and facility needs for the base case and the OCS scenarios.

This use of uniform standards uniformly applied has the advantages of simplicity, of minimizing local biases and of yielding easily compared forecasts of impacts upon individual communities under the different scenarios. Conversely, the methodology has the disadvantage of slighting local features which may importantly influence the shape that impacts take. As a result, the methodology may occasionally generate unrealistic impact forecasts. Whenever(the uniform standards produced a forecast at odds with common sense or known local constraints, this was noted and an alternative forecast and the reasons for it were presented.

The revenue and expenditure forecasts require some special qualifications for their proper use and understanding. The fiscal forecasts simply carry forward into the future the local revenue patterns and expenditure practices which prevailed before the forecast period, adjusted for population growth (as determined by the economic base analysis) and for inflation at an annual rate of 6 percent. In terms of purchasing power, local property tax revenues were kept at a constant per capita level by ignoring inflation, except for the addition of revenue from new OCS-related industrial property which is taxed at the prevailing local rate, subject to the limits of State law.

The general fund and school district expenditure forecasts assume that each local governing unit will maintain its present level, variety and quality of services at its present per capita costs. On the whole, this is a debatable assumption, though it is not easy to pinpoint when and where exceptions to it may occur. Finally, the forecast of funds surplus to operating expenditures and available for capital improvements, debt' service or other purposes is obtained by subtracting expenditures from revenues.

The fiscal forecasts also do not take into account the possible changes in local tax policies (i.e., adoption of a use tax) or in local governmental operations (i.e., assumption of additional functions by the Kenai Peninsula Borough) or State tax policies (i.e., revision of the statutes governing local taxation of oil and gas property) or many other factors which could radically upset the fiscal balance. While it is granted that factors of this sort may well alter fiscal relationships, they are not for that reason alone germane to the fiscal analysis of growth impacts stemming from the OCS lease sale.

Again, it should be emphasized that this methodology has limited validity for predicting the services and facilities which will actually be provided in the future or for predicting actual expenditure and revenue patterns. For example, since the methodology imposes common standards for public service levels and assumes a continuation of current local fiscal practices, it cannot allow for local decisions to alter the assumed pattern of services or the pattern of taxation and expenditures. Nevertheless, the methodology does provide comparisons, within the framework of the assumptions, suggestive of the trend of growth impacts on the settlements under study and that is the point of these OCS scenarios.

Finally, a major but necessary omission from the forecasts of local government revenues and expenditures is a projection of a long term capital requirements to finance major capital improvements. In order to present such information, a complete needs assessment of the range of community facilities and services for each community would be required, a local assessment of the relative priority for improvement or replacement of various projects would then be made, and cost estimates and the means for financing such projects would be developed. Such Information is not available for Kenai, Soldotna or Homer and its development is well beyond the scope of this study. Nevertheless, it is needed to present a complete picture of the probable financial demands on communities under conditions of a non-OCS and several OCS scenarios and its absence from this report and the reasons for it are hereby noted.

PROJECTIONS OF GROWTH - BASE CASE

Kenai-Cook Inlet Census Division

BASE CASE - EMPLOYMENT AND POPULATION

Non-OCS Employment

The base case forecast of employment and population growth for the cities of Kenai, Soldotna and Homer was derived from an overall analysis of the economy of the Kenai-Cook Inlet Census Division, which comprises the western half of the Kenai Peninsula Borough.

For the forecast period, anticipated trends in the region's economic base were assessed and, upon this assessment, sector-by-sector growth rates were projected for future employment in the Kenai-Cook Inlet Labor Area and the Homer Labor Area.

Two events were segregated and treated as separate incremental contributors to the region's economic growth, apart from the economic base analysis: the first-generation OCS Sale CI and construction and operation of the proposed Pacific-Alaska LNG plant at North Kenai. The employment attributable to these two projects was individually estimated and then incorporated into the employment forecasts for the Kenai-Cook Inlet and Homer Labor Areas. Next, by use of a population/employment ratio, population estimates were calculated for the Kenai-Cook Inlet and Homer

Labor Areas. Finally, each labor area's population estimate was subdivided among the cities and their respective hinterlands.

Thus, this base case forecast is not a non-OCS forecast. It does include a level of OCS activity corresponding to a medium level of exploration success in Sale CI as well as a strong base level of oil and gas-related industrial facilities developed for earlier leases in the Cook Inlet Province. This aspect of the base case assumes significance in the impact assessment of the petroleum scenarios since it presents a situation in which many Sale 60 activities can draw upon industrial facilities with excess capacity due to the decline of earlier producing fields.

The sector-by-sector analysis of regional economic trends follows.

Oil and Gas. An inelastic demand for petroleum will exist throughout the planning period from 1980 through 2000 for Cook Inlet petroleum resources.

Although petroleum production from existing Upper Cook Inlet oil and gas fields will be declining throughout the planning period, strong demand for domestic oil and gas production will result in tertiary recovery from these fields through the year 2000. In addition, new petroleum production is assumed from State leases in the Cook Inlet area (and from offshore leases in OCS Lease Sale CI).

It is also assumed that the existing and forecast natural gas reserves are sufficient to maintain current levels of production throughout the forecast. However, substantial additions to processing capacity are not seen to occur during this period.

Any shortfall in crude oil production from Cook Inlet fields supplying Cook Inlet refineries is assumed to be offset by crude oil importation from other areas of Alaska or elsewhere. Thus, these facilities are assumed to operate at or above current levels throughout the planning period. However, substantial additions to processing capacity are not seen to occur during the period of forecast.

Possible declines in petroleum mining related employment due to production from Upper Cook Inlet platforms ceasing is assumed to be more than compensated for by increases in oil service industry employment resulting from servicing oil developments in other areas of the State.

Fishing and Seafood Processing. Growth in fishing and seafood processing employment is assumed to result from increased-yields in the traditional fisheries of the Kenai-Cook Inlet area and successful entry and exploitation of deep sea fishing resources.

The harvesting and processing of deep sea fishery resources (or so called groundfish or bottomfish) is assumed to take place in the southern Kenai Peninsula area, particularly Homer. Also, some supply of bottomfish to offshore processing vessels by fishing boats based in this area is foreseen.

Although involvement in deep sea fisheries is forecast to result in substantial employment increases, the sum of the increase in employment in the fishing and fish processing sector is assumed to be even greater since the base which is vested in the traditional fisheries is forecast to increase also.

Traditional fishing and fish processing are forecast to increase modestly throughout the planning period. These increases are based in part upon increased knowledge and experience by the State of Alaska in the management of traditional species such as salmon, king crab, tanner crab and other species taken in this area. This more capable management will enable the regulatory authorities to stabilize the production of these fisheries and permit catches approaching optimum yields.

It is also assumed that further diversification of fisheries products with the addition of bottomfish as an example and the fisheries product mix in Cook Inlet plants, especially the southern Kenai Peninsula plants, will result in a substantial year-round operation with a more stable, resident labor force in the fishing and fish processing sector.

Improved management and greater yields in Alaska's fisheries districts will continue to result in part from the 200 miles offshore limit imposed by the United States and the recently agreed upon U.S./Japan treaty which limits Japanese salmon catches beyond the 200 mile limit.

Overall, it is assumed that the improved management of Alaska fishery resources gained through law, treaty, knowledge and experience will result in a more dependable and larger harvest of fisheries resources during the period of this forecast.

Tourism and Recreation. The tourism and recreation industry is forecast to become a more significant factor in the economic growth of the Kenai-Cook Inlet area. General population growth, as forecast for the Southcentral region by the Institute of Social and Economic Research for a "moderate base case", together with increased visitor traffic to the Kenai Peninsula Borough originating outside the State, are expected to intensify use of the area's tourism and recreational assets.

The tourism and recreation sector within the Kenai-Cook Inlet area is seen responding to this increased potential by providing the facilities and services necessary to support increased tourism and recreation.

The Kenai-Cook Inlet area is assumed to attract a more than proportionate share of the total visitor traffic venturing beyond the Anchorage area. Especially important in attracting and accommodating visitor traffic will be the Homer area although all areas within the Kenai-Cook Inlet area will realize visitation increases:

Logging and Wood Products. Although the Kenai-Cook Inlet area contains substantial timber resources with major wood processing plants located at Jakolof Bay and Tyonek, conflicts with the fishing and fish processing industry and the tourist and recreation industry are seen as inhibiting factors to further growth.

Logging and wood processing currently occupy a small position in the economy and basic employment of the Kenai-Cook Inlet area and, despite the potential of this industry to expand, it is assumed to remain at current levels throughout the forecast period, for reasons noted in the preceding paragraph.

Government. A modest rate of growth is assumed to take place in basic government employment during the forecast period. Increases in resident population and visitors, especially those engaged in tourism and recreation, are assumed to result in the need for more intensive management in areas of fish and wildlife. Additional basic Federal employees are seen to be needed to protect and manage the fish and wildlife within the Kenai Moose Range. Also, additional basic State employees will be required to protect the productive fish streams, rivers and beaches of this area as well as to manage State Parks and recreational facilities provided to accommodate visitors.

Increased offshore activities in petroleum development and deep sea fishing as well as increased recreational boating will necessitate increases in U.S. Coast Guard employment. And in the air, the increases in fixed wing and helicopter traffic resulting from offshore development and general economic and population growth will result in increased basic Federal and State employment.

It is also assumed at the State and local level that the substantial intergovernmental transfers, principally in the form of grant funds, resulting in basic employment within the Kenai-Cook Inlet area will be maintained roughly in proportion to increases in population within the area.

In summary, increases in basic employment during the period of the forecast are assumed to result from the same natural resource-based industries now supporting basic employment in the area. However, these industries are forecast to range further from the Kenai-Cook Inlet area in providing the products supporting basic employment. The fishing industry is forecast to range further into the ocean for bottomfish. The petroleum industry will move further out on the continental shelf to produce oil and gas and utilize more extensive methods to realize tertiary recovery from existing fields. And greater numbers of visitors will travel to the area from greater distances to enjoy tourist and recreation opportunities on the lands and waters of the Kenai-Cook Inlet area.

In the principal sectors, basic employment in Agriculture, Forestry and Fisheries is forecast to increase in the Kenai-Cook Inlet Census Division at 4 percent per year from 1979 to 1990 and 2.5 percent per year from 1991 to 2000. This increase is based solely upon growth in the fisheries with bottomfishing being a major factor. Since a large portion of the growth is forecast to take place through bottomfishing and through greater yields in the total mix of fish catches, the southern Kenai Peninsula area is forecast to experience greater growth. Homer area basic employment in Agriculture, Forestry and Fisheries is forecast to increase at a rate of 5 percent per year from 1979 to 1990 and 3 percent per year from 1991 to 2000. On the other hand, basic employment in this sector in the Kenai-Soldotna area, where salmon fishing dominates, is forecast to increase steadily at 1.5 percent per year throughout the planning period.

Basic employment in manufacturing which is vested primarily in petroleum processing and seafood processing is forecast to increase at a modest 2 percent per year in the non-OCS forecast for the Kenai-Cook Inlet Census Division. (The inclusion of the OCS Sale CI in the base case does not alter this growth since the same facilities and employment are used to process the petroleum production of Sale CI. However, it results in maintaining a share of petroleum employment at current levels).

Of course, basic employment growth varies for the area under study within the Kenai-Cook Inlet Census Division. The Homer Area whose basic manufacturing employment is vested in seafood processing is forecast to increase at 5 percent per year from 1979 to 1990 and 3 percent per year from 1991 to 2000. In the Kenai-Soldotna area, where petroleum processing employment dominates, basic employment is expected to increase at 2 percent per year throughout the forecast period.

Basic non-OCS employment in mining in the Kenai-Cook Inlet Census Division is located almost exclusively in the Kenai-Soldotna area and is almost exclusively petroleum industry related employment. This basic employment sector is forecast to increase by 1.0 percent per year in the Kenai-Soldotna area, whereas no employment is recorded in this sector in the Homer area.

The distributive industry sectors of Transportation, Communications and Public Utilities, Trade and Services support basic non-OCS employment in the Kenai-Cook Inlet Census Division through provision of goods and services primarily to basic industries, visitors, transient fishing vessels and offshore petroleum operations.

Basic employment in Transportation, Communications and Public Utilities is forecast to increase at 3.5 percent per year throughout the planning period in the Kenai-Cook Inlet Census Division. The Kenai-Soldotna area where this sector, especially in transportation, is extensively developed is forecast to increase at 3 percent per year from 1979 to 2000. Some economies of scale are seen in this sector. The Homer area with a less developed basic economy in this sector is forecast to increase at 4 percent per year throughout the forecast period.

Activities in the trade sector and service sector are forecast to result in a basic employment growth of 3.75 percent per year in the Kenai-Cook Inlet Census Division. Primarily because of tourism and recreation, basic employment in the Homer area is forecast to increase at 4 percent per year while lesser involvement in the Kenai-Soldotna area will result in an annual growth of 3.5 percent for the length of the forecast.

Basic employment in the sectors of Contract Construction and Finance, Insurance and Real Estate facilitate the development of basic economic activities such as petroleum development. The basic employment in the Kenai-Cook Inlet Census Division is forecast to increase at 3.5 percent per year. Basic employment in the Homer area is somewhat higher at 4 percent per year in each of these sectors while in the Kenai-Soldotna area both sectors are forecast 'to increase by 3 percent per year throughout the forecast period.

The forecast for basic employmentin the Government sector in the Kens"i-Cook Inlet Census Division Area as a whole and the Kenai-Soldotna and Homer areas is forecast at 3 percent per year throughout the period of the forecast.

The overall growth rate in basic employment for all industry sectors in the Kenai-Cook Inlet Census Division is estimated at approximately 2.8 percent per year (Table 2), with the Homer area increasing at about 3.8 percent per year (Table 4) and the Kenai-Soldotna area increasing roughly at 2.4 percent per year (Table 3).

<u>Secondary Employment.</u> Since the existence of service employment is dependent upon expenditures of the basic sector, service employment can be derived roughly from basic employment through the use of a multiplier to elicit total employment. Total employment minus basic employment equals service employment.

TABLE 2

FORECAST OF NON-OCS EMPLOYMENT AND POPULATION
KENAI-COOK INLET CENSUS DIVISION
LOWER COOK INLET
1980 - 2000

Year	Basic Employment	Secondary Employment	Total Non-OCS Employment	Total Non-OCS Population
1980	4,574	3,430	8,004	24,012
1981	4,703	3,527	8,230	24,690
1982	4,835	3,626	8,461	25,383
1983	4,970	3,728	8,698	26,094
1984	5,110	3,832	8,942	26,826
1985	5,254	3,940	9,194	27,582
1986	5,405	4,054	9,459	28,377
1987	5,559	4,169	9,728	29,184
1988	5,718	4,288	10,006	30,018
1989	5,883	4,412	10,295	30,885
1990	6,053	4,540	10,593	31,779
1991	6,213	4,660	10,873	32,619
1992	6,378	4,784	11,162	33,486
1993	6,545	4,909	11,454	34,362
1994	6,722	5,042	11,764	35,292
1995	6,900	5,175	12,075	36,225
1996	7,086	5,314	12,400	37,200
1997	7,277	5,458	12,735	38,205
1998	7,474	5,606	13,080	39,240
1999	7,676	5,757	13,433	40,299
2000	7,882	5,912	13,794	41,382

Source: Alaska Consultants, Inc.

TABLE 3

FORECAST OF NON-OCS EMPLOYMENT AND POPULATION
KENAI-SOLDOTNA AREA
LOWER COOK INLET
1980 - 2000

Year	Basic Employment	Secondary Employment	Total Non-OCS Employment	Total Non-OCS Population	City of Kenai	City of Soldotna	Remaining Area
1980	2,960	2,220	5,180	14,504	4,714	2,538	7,252
1981	3,026	2,270	5,296	14,828	4,819	2,595	7,414
1982	3,095	2,321	5,416	15,165	4,853	2,729	7,583
1983	3,166	2,375	5,541	15,515	4,965	2,792	7,758
1984	3,239	2,429	5,668	15,870	4,999	2,936	7,935
1985	3,313	2,485	5,798	16,234	5,114	3,003	8,117
1986	3,391	2,543	5,934	16,615	5,151	3,156	8,308
1987	3,470	2,602	6,072	17,002	5,271	3,230	8,501
1988	3,549	2,662	6,211	17,391	5,305	3,390	8,696
1989	3,632	2,724	6,356	17,797	5,428	3,470	8,899
1990	3,719	2,789	6,508	18,222	5,467	3,644	9,111
1991	3,806	2,854	6,660	18,648	5,594	3,730	9,324
1992	3,895	2,921	6,816	19,085	5,726	3,816	9,543
1993	3,987	2,990	6,977	19,536	5,861	3,907	9,768
1994	4,085	3,064	7,149	20,017	6,005	4,003	10,009
1995	4,182	3,136	7,318	20,490	6,147	4,098	10,245
1996	4,284	3,213	7,497	20,992	6,298	4,198	10,496
1997	4,384	3,288	7,672	21,482	6,445	4,296	10,741
1998	4,491	3,368	7,859	22,005	6,602	4,400	11,005
1999	4,600	3,450	8,050	22,540	6,762	4,508	11,270
2000	4,712	3,534	8,246	23,108	6,932	4,622	11,554

Source: Alaska Consultants, Inc.

TABLE 4

FORECAST OF NON-OCS EMPLOYMENT AND POPULATION
HOMER AREA
LOWER COOK INLET
1980 - 2000

Year	Basic Employment	Secondary Employment	Total Non-OCS Employment	Total Non-OCS Population	City of Homer	Remaining Area
1980	964	733	1,697	5,091	2,087	3,004
1981	1.005	764	1.769	5,307	2,229	3,078
1982	1 ,052	800	1 ,852	5,556	2,389	3,167
983	1,098	834	1,932	5,796	2,550	3,246
984	1,146	871	2,017	6,051	2,723	3,328
985	1,198	910	2,108	6,324	2,909	3,415
986	1,252	952	2,204	6,612	3,108	3,504
987	1,304	992	2,295	6,885	3,305	3,580
988	1,363	1,036	2,399	7,197	3,527	3,670
989-	1,424	1,082	2,506	7,518	3,759	3,759
990	1,489	1,132	2,621	7,863	3,932	3,931
991	1,536	1,167	2,703	8,109	4,055	4,054
992	1,586	1,205	2,791	8,373	4,187	4,186
993	1,638	1,245	2,883	8,649	4,325	4,324
994	1,692	1,286	2,978	8,934	4,467	4,467
995	1,748	1,328	3,076	9,228	4,614	4,614
1996	1,806	1,373	3,179	9,537	4,769	4,768
1997	1,865	1,417	3,282	9,846	4,923	4,923
1998	1,927	1,465	3,392	10,176	5,088	5,088
1999	1,989	1,512	3,501	10,503	5,252	5,251
2000	2,056	1,563	3,619	10,857	5,429	5,428

Source: Alaska Consultants, Inc.

The 1979 employment estimate by Alaska Consultants, Inc. derived from Alaska Department of Labor, Employment Security Division statistics for the Kenai-Cook Inlet Labor Area totaled 7,795. Estimates of basic and service employment were 4,451 and 3,344 respectively (see Table 5). Thus, the multiplier derived is 1.75. The multiplier appears reasonably representative of an area in which there is a mixture of stable, year-round industrial employment with high wage rates and seasonal activities with large transient work forces.

The sum of the basic employment in the industrial sectors for each of the years forecast multiplied by the multiplier of 1.75 produces the estimate of total employment for each year. Of course, there are many factors which could result in the multiplier changing. However, rather than speculating upon these changes, the multiplier is assumed to be constant throughout the forecast period.

The estimate of total employment for the Kenai-Soldotna area made by Alaska Consultants, Inc. from Employment Security Division data is 5,075 in 1979. The estimate of basic employment is 2,893 with secondary employment estimated to be 2,182 (see Table 6). Thus, the multiplier derived is 1.75 which is the same as that estimated for the Kenai-Cook Inlet Labor Area. However, it is not at all surprising that these multipliers are similar considering the dominance of the Kenai-Soldotna area with approximately 65 percent of the Labor Area's employment.

TABLE 5

AVERAGE ANNUAL FULL-TIME EMPLOYMENT
KENAI-COOK INLET LABOR AREA
1979 a/

Industry Classification	Number	%	% Basic	Basic Number	Secondary Number
Agriculture, Forestry and Fishing b/	700	9.0	99	693	7
Mining	745	9.6	99	738	7
Contract Construction c/	600	7.7	35	210	390
Manufacturing	1,230	15.8	98	1,205	25
Transportation, Communication & Public Utilities	680	8.7	50	340	340
Trade	1,275	16.4	35	446	829
Finance, Insurance & Real Estate	260	3.3	25	65	195
Service	1,050	13.5	30	315	735
Government	1,255	16.1	35	439	816
TOTAL	7,795	100.0*	57	4,451	3,344

a/ Average annual full-time employment from the Alaska Department of Labor, Employment Security Division from 1970-1977 projected by annual average increase by sector to obtain 1979 estimates. Estimates in 1979 were desired to make data reasonably compatible with Alaska Consultants' count in the Homer area.

b/ Number of fishermen employed on an average annual year-round basis estimated by using yearly registration data, length of fishing season and "normal" crew sizes for various types of fishing vessels.

c/ The major construction projects at Collier Carbon and Chemical Corporation's urea plant and Tesoro's refinery reflected in the 1977 contract construction employment figures were discounted. Previous, more "normal" contract construction employment figures were used as a basis for the 1979 estimates.

Source: Alaska Department of Labor, Employment Security Division. 1978. Alaska Labor Force Estimates by Area and Employment by Industry. Juneau.

Alaska Consultants, Inc.

e

AVERAGE ANNUAL FULL-TIME EMPLOYMENT
KENAI-SOLDOTNA LABOR AREA a/
1979 b/

Industry Classification	Number	%	% Basic	Basic Number	Secondary Number
Agriculture, Forestry and Fishing c/	100	2.0	100	100	0
Mining	765	15.1	99	759	6
Contract Construction d/	400	7.9	48	190	210
Manufacturing	745	14.7	99	739	6
Transportation, Communication & Public Utilities	385	7.6	55	211	174
Trade	980	19.3	35	343	637
Finance, Insurance & Real Estate	165	3.2	25	41	124
Service	735	14.4	29	215	520
Government e/	800	15.8	37	295	505
Federal	(90)	(1.8)	(80)	(72)	(18)
State	(170)	(3.4)	(52)	(88)	(82)
Local	(540)	(10.6)	(25)	(135)	(405)
TOTAL	5,075	100.0	57	2,893	2,182

a/ The Kenai-Soldotna Labor Area is defined as the sum of Kenai Precincts Number 1, 2 and 3, Nikiski Precincts Number 1 and 2, Soldotna, Ridgeway and Kalifonsky.

b/ Average annual full-time employment from the Alaska Department of Labor, Employment Security Division from 1970-77 and 9 months of 1978 projected by annual average increase by sector to obtain 1979 estimates. Estimates in 1979 were desired to make data reasonably compatible with Alaska Consultants' 1979 count in the Homer area.

c/ Number of fishermen employed on an annual average year-round basis estimated by using yearly registration data, length of fishing seasons and "normal" crew sizes for various types of fishing vessels.

d/ The major construction projects at Collier Carbon and Chemical Corporation's urea plant and Tesoro's refinery reflected in the 1977 contract construction employment figures were discounted. The average of the nine months of 1978 were used as a basis for the 1979 estimate.

e/ Employment figures for 1979 government employment were obtained from communications with all federal, State and local government units in the Kenai-Soldotna area.

Sources: Alaska Department of Labor, Employment Security Division. 1978 Alaska Labor Force Estimates by Area and Employment by Industry. Juneau.

Alaska Consultants, Inc.

TABLE 7

AVERAGE ANNUAL FULL-TIME EMPLOYMENT a/
HOMER LABOR AREA b/

Industry Classification	Number	%	% Basic	Basic Number	Secondary Number
Agriculture, Forestry and Fishing	400 c/	24.7	98	392	8
Mining	o d/	0.0	--	0	0
Contract Construction	49	3.0	12	6	43
Manufacturing	151	9.3	95	143	8
Transportation, Communication & Public Utilities	139	8.6	46	64	75
Trade	311	19.2	37	115	196
Finance, Insurance & Real Estate	77	4.7	31	24	53
Service	198	12.2	24	53	145
Government	296	18.3	42	125	171
Federal	(78)	(4.8)	(80)	(62)	(16)
State	(71)	(4.4)	(48)	(34)	(37)
Local	(147)	(9.1)	(20)	(29)	(118)
TOTAL	1,621	100.0	57	922	699

a/ Includes self-employed and military personnel.
b/ The Homer Labor Area is defined as the Homer Precinct, Anchor Point, Fritz Creek, Diamond Ridge and Kachemak.
c/ Number of fishermen employed on an average annual year-round basis estimated by using yearly registration data, length of fishing season and normal "crew" sizes for various types of fishing vessels.
d/ Minor employment in sand and gravel considered with contract construction and transportation.

Source: Alaska Consultants, Inc.

The Homer area in which Alaska Consultants, Inc. conducted its own employment count during 1979 totaled 1,621 employees; however, this figure included self-employed persons and military personnel. The estimate of basic employment is 883, with secondary employment estimated to be 738 (see Table 7). The multiplier derived is 1.84.

This is a high multiplier for a rural area. However, this employment count includes a large number of self-employed persons engaged in marginal retailing and service enterprises. These enterprises are heavily weighted toward providing goods and services to the resident population and are therefore classed as secondary.

Total Employment. Since the multiplier of basic to secondary employment is assumed to remain constant during the forecast period, the rate of increase in basic employment is equal to the rate of increase in total employment. Therefore, the Kenai-Cook Inlet Labor Area in which total employment is forecast to increase from an estimated 7,795 employees in the 1979 base year (Table 5) to 15,794 employees estimated in the year 2000 (Table 2) is forecast to increase by approximately 2.8 percent per year.

The Kenai-Soldotna area is projected to increase from an estimated 5,075 employees in 1979 (Table 6) to 8,246 in 2000 (Table 3) or by about 2.4 percent per year. And the Homer area is projected to increase by approximately 3.8 percent annually or from 1,621 employees in 1979 (Table 7} to 3,619 employees in 2000 (Table 4).

Non-OCS Population

Given the population composition and the propensity for people desiring a semi-rural lifestyle in an attractive, natural setting to migrate to the Kenai-Cook Inlet Census Division, the ratio of population to employment in this area is assumed to remain constant at approximately 3.0. (Population in Table 8 divided by employment in Table 5). This ratio coupled with the growth in employment results in a population growth forecast to be approximately 3 percent per year. The non-OCS population of the Kenai-Cook Inlet Census Division is forecast to increase from 23,552 (Table 8) in the base year of 1979 to 41,382 (Table 2) in the year 2000, or by a total of 71 percent.

In the Kenai-Soldotna area, where a large portion of the basic employment is outside these two incorporated cities and where the growth rates among industries are forecast to change, the distribution of population among the City of Kenai, City of Soldotna and the remaining area (Table 9) is assumed to change (Table 10) during the period of the forecast. The ratio of population to employment in this area is 2.8 (population in Table 8 divided by employment in Table 6) and is forecast to remain constant. As a result, the population of the City of Kenai is forecast to increase from 4,631 in 1979 to 6,932 (Table 3) in 2000. Although this is an increase of 46 percent, the growth rate is slightly less than 2 percent per year. The City of Soldotna's population, conversely, is forecast to increase at a rate slightly over 3 percent per year from 2,486 in 1979 to 4,622 (Table 3) in 2000, or by approximately 80 percent overall.

TABLE 8

ESTIMATED POPULATION
KENAI-COOK INLET CENSUS DIVISION AND SELECTED AREAS
1979

	1978 Census a/	1979 Est. b/
KENAI-COOK INLET CENSUS DIVISION	22,271	23,552
KENAI AREA	7,859	
Kenai Precinct No. 1	1,731	
Kenai Precinct No. 2	1,779	
Kenai Precinct No. 3	864	
Nikiski Precinct No. 1	1,481	
Nikiski Precinct No. 2	2,004	
SOLDOTNA AREA	5,538	
Soldotna	2,365	
Ridgeway	1,472	
Kalifonsky	1,701	
TOTAL KENAI & SOLDOTNA AREAS	13,397	14,167
HOMER AREA	5,081	
Homer	2,054	
Anchor Point	1,447	
Fritz Creek	876	
Diamond Ridge	433	
Kachemak	271	
TOTAL HOMER AREA	5,081	5,373

a/ Special Census of Population, U.S. Bureau of the Census, July 1978.

b/ Estimates for 1979 derived by projecting 1978 population based upon an historical growth rate of 5.75 percent between 1970 and 1978 in the Kenai-Cook Inlet Census Division.

Sources: Kenai Peninsula Borough, Growth Monitoring Program Advisory Committee. March 1979. Kenai Peninsula Borough: Special Census of the Population. Soldotna, March 1979. (Special Report Number 1).

Alaska Consultants, Inc.

TABLE 9

DISTRIBUTION OF POPULATION
KENAI-SOLDOTNA AND HOMER AREAS
1978

	Population	Percent a/
KENAI-SOLDOTNA AREA	13,397	100.0
Cities of Kenai and Soldotna	6,739	50.0
City of Kenai	(4,374)	(32.5)
City of Soldotna	(2,365)	(17.5)
Remaining Area	6,658	50.0
HOMER AREA	5,081	100.0
City of Homer	2,054	40.5
Remaining Area	3,027	59.5

a/ Rounded to nearest 0.5 percent.

Source: Kenai Peninsula Borough, Growth Monitoring Program Advisory Committee. March 1979. Kenai Peninsula Borough: Special Census of the Population. Soldotna, March 1979. (Special Report" Number 1).

T B.E 10

PERCENTAGE ALLOCATION OF ESTIMATED NON-OCS POPULATION
SELECTED KENAI-COOK INLET CENSUS DIVISION AREAS

Year	Kenai-Soldotna Area: City of Kenai	Kenai-Soldotna Area: City of Soldotna	Kenai-Soldotna Area: Remaining Area	Kenai-Soldotna Area: Total Kenai-Soldotna Area	Homer Area: City of Homer	Homer Area: Remaining Area	Homer Area: Total Homer Area
1980	32.5	17.5	50.0	100.0	41.0	59.0	100.0
1981	32.5	17.5	50.0	100.0	42.0	58.0	100.0
1982	32.0	18.0	50.0	100.0	43.0	57.0	100.0
1983	32.0	18.0	50.0	100.0	44.0	56.0	100.0
1984	31.5	18.5	50.0	100.0	45.0	55.0	100.0
1985	31.5	18.5	50.0	100.0	46.0	54.0	100.0
1986	31.0	19.0	50.0	100.0	47.0	53.0	100.0
1987	31.0	19.0	50.0	100.0	48.0	52.0	100.0
1988	30.5	19.5	50.0	100.0	49.0	51.0	100.0
1989	30.5	19.5	50.0	100.0	50.0	50.0	100.0
1990	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1991	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1992	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1993	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1994	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1995	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1996	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1997	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1998	30.0	20.0	50.0	100.0	50.0	50.0	100.0
1999	30.0	20.0	50.0	100.0	50.0	50.0	100.0
2000	30.0	20.0	50.0	100.0	50.0	50.0	100.0

Source: Alaska Consultants, Inc.

Bottomfish processing and tourism and recreation are forecast to be principal factors in the City of Homer's population growth which is forecast to increase at slightly over 5 percent per year. The City of Homer's population is projected to increase by 153 percent during the period of the forecast or from 2,171 in 1979 to 5,429 (Table 4) in 2000. Population increases during the next decade are forecast to result in an increasing proportion of the Homer area's population living within the City of Homer (see Tables 9 and 10).

OCS Sale CI

Employment. The Sale CI portion of the Base Case employment and population is derived from a petroleum scenario which is assumed to be representative of a medium find scenario for the current OCS Lease Sale cr. In deriving the Sale CI Medium Find Scenario, the following assumptions were made:

A Sale CI Medium Find Scenario is assumed as part of the base case of employment and population forecasts for the Kenai-Cook Inlet coastal area (Kenai-Cook Inlet Census Division).

The USGS resource estimates for the Lower Cook Inlet OCS area are allocated two-thirds for Sale CI and one-third for Sale 60.

The estimates for the Sale CI medium find scenario are 400 million barrels of oil and 402 billion cubic feet of unassociated natural gas.

Field development in Sale 60 considers costs, especially pipeline, to be shared with Sale CI.

- The Sale 60 high find scenario assumes an offshore and onshore gas pipeline to be in place as a result of field development from Sale CI. A subsea gas pipeline is assumed to have been constructed from a field(s) between Cape Douglas and the Barren Islands to Anchor Point for a distance of 97 kilometers (60 miles). Onshore, a 129 kilometer (80 mile) pipeline is assumed to have been constructed which would carry the gas from Anchor Point to existing LNG facilities in the Nikiski area.

- The Sale 60 medium find scenario assumes an offshore and onshore oil pipeline in the same vicinity. A subsea oil pipeline is assumed to have been constructed as a result of Sale CI development from a field(s) off Point Bede to Anchor Point for a distance of 129 kilometers (40 miles). The onshore portion of this pipeline is assumed to have been constructed from Anchor Point for a distance of 97 kilometers (80 miles) to existing oil terminal facilities in Nikiski.

No precise scenario had been developed for the Sale CI medium find scenario. However, a medium find oil production schedule was forecast by Dames and Moore based upon the USGS resource estimates.

- Approximate production was 400 million barrels of oil.

- Production would begin during 1986 and terminate during 1998 or production would last 13 years.

The Sale 60 high find scenario for the Lower Cook Inlet (excluding the Shelikof Strait area) is assumed to be representative of the Sale CI medium find scenario with specific modifications.

- This scenario results in the production of 400 million barrels of oil and 363 billion cubic feet of natural gas.

The modifications assumed for the Sale 60 high find scenario for Lower Cook Inlet are as follows:

- The production schedule and, therefore, the sequence of activities in all phases resulting in oil production is shifted to 1986 for oil and 1987 for gas.

- Oil production is assumed to terminate in 1998 or after 13 years of production.

- Gas production which begins in 1987 is assumed to terminate after 10 years or during 1996 rather than after 8 years. This is assumed to allow the recovery of 400 billion cubic feet of gas rather than 363 billion cubic feet.

- Previous offshore pipeline employment in the model is discounted as well as its effects on service base, helicopter and supply boat employment.

- Offshore pipelaying employment to construct 129 kilometers (40 miles) of subsea oil pipeline during 1986 and 97 kilometers (60 miles) of subsea gas pipeline during 1987 is substituted along with the employment effects on the other groups of tasks.

- Onshore pipelaying employment to construct 129 kilometers (80 miles) of oil pipeline and 129 kilometers (80 miles) of gas pipeline during 1985-86 is substituted for the previous onshore pipelaying in the Sale 60 high find scenario for the Lower Cook Inlet portion only.

Since Sale CI concludes within the period of the Base Case forecast, the annual additions of Sale CI employment and population to the non-OCS forecast result in higher annual averages and intermediate changes in the rates of growth but do not alter the long-term growth rates from the 1979 base year to the end of the forecast period in 2000. However, Sale CI is foreseen to assure the utilization of existing Cook Inlet petroleum facilities at or near capacity. And, although no tertiary recovery is assumed in this scenario, should the level of production in the forecast result there is a distinct probability of tertiary recovery under the assumption for the non-OCS forecast.

The basic or direct employment exhibited by the Medium Find Scenario for Sale CI is reasonably typical of OCS petroleum development. Onshore employment is reasonably small during the first 5 years (1979-83) of exploration. Service bases located on the waterfront provide materials to the offshore rigs while at the airport, helicopters transport employees and small volume, light weight freight to the rigs (see Table 11). This is followed by 4 years (1984-87) of intensive development where offshore platform installation, development drilling and subsea pipelaying and burying are supported from onshore. In this scenario it is onshore pipelaying and pipe coating which result in the onshore employment peak of 283 onshore-onsite employees. However, the largest onshore employment impact is generally created by oil terminal and LNG plant construction. This scenario assumes that the existing Cook Inlet plants and employees will accommodate the oil and gas production from this scenario.

The onshore production phase (1988-98) provides stable employment until platforms are taken off line beginning in 1997. Again, a higher level of employment is usually encountered where oil terminal and LNG plant employment is provided in this scenario.

Offshore employment (Table 12) is much greater than onshore employment except where platform construction and other major facilities construction takes place onshore during the development phase. This is not the case here. It is important to note that onsite employment is used in Table 12 to convey what is actually taking place at a given period of time offshore. Actually, much of the intensive employment offshore such as

TABLE

YEARLY ONSHORE ONSITE MANPOWER REQUIREMENTS BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI)
1979 - 1998

Year	Service Base	Helicopter Service	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Concrete Platform Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1979	9	5									14
1980	18	10									28
1981	18	10									28
1982	18	10									28
1983	17	10									27
1984	33	3									36
1985	33	4		167							204
1986	68	10		167				39			284
1987	60	13						58			131
1988	43	15									58
1989	41	15									56
1990	35	15									50
1991	41	15									56
1992	41	15									56
1993	41	15									56
1994	41	15									56
1995	41	15									56
1996	41	15									56
1997	30	12									42
1998	27	10									37

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 12

YEARLY OFFSHORE ONSITE MANPOWER REQUIREMENTS BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI)
1979 - 1998

Year	Survey	Rig	Platform	Supply/Anchor/ Tug Boat	Platform Installation	Offshore Pipeline Construction	Total Offshore Onsite
1979	17	56		26			99
1980	29	112		52			193
1981	25	112		52			189
1982	29	112		52			193
1983	19	112		52			183
1984				46	146		192
1985			112	46	146		304
1986			257	102	146	72	577
1987			374	54		108	536
1988			475	36			511
1989			263	36			299
1990			149	36			185
1991			166	36			202
1952			181	36			217
1993			181	36			217
1994			181	36			217
1995			181	36			217
1996			181	36			217
1997			156	33			189
1998			131	24			155

Source: Dames and Moore/Alaska Consultants, Inc.

work on rigs and platforms is performed by crews who work two weeks on and two weeks off. Therefore, there is an equal number of employees on leave ashore.

As with onshore employment, reasonably consistent yearly employment is assured during the exploration phase. This is followed by a peak in employment of almost three times this number during the development phase when platforms are being installed, subsea pipeline is being laid and buried and development drilling is taking place. This is followed by a stable yearly production phase employment which is in the range of 40 percent below the development phase.

Only basic employment onshore and offshore by task is depicted in this scenario (Tables 11 and 12) for the entire Sale CI work force. This provides a graphic indication of the OCS petroleum development taking place, but it does not necessarily indicate employment-related impacts upon the local communities. In this scenario, it is necessary to make assumptions regarding the area of location of onshore employees and the secondary employment generated by the onshore activity. With offshore employment, assumptions must be made as to the numbers assumed to be resident in the local area as well as the secondary employment generated. The sum of the onshore and offshore basic employment resident in the Kenai-Cook Inlet Census Division and the secondary employment generated by this offshore and onshore employment is the total employment resident in the area under study.

The principal assumptions for OCS operations necessary to disaggregate onshore employment in the general Kenai and Homer areas involve the location of facilities (see Table 13). Service bases are assumed for both the Kenai area and the Homer area. The Homer service base is assumed to be a forward service base which will accommodate all survey vessel activity and one-third of the rig service activities during the exploration phase. During the development phase, it will provide one-third of the support for platform construction, subsea pipelaying and burying and development drilling from platform. In addition, a construction camp for one-half of all onshore pipeline construction will be located in this area. However, all of these activities are assumed to cease upon entry into the production phase. Only the helicopter service operating from Homer Airport is forecast throughout the petroleum scenario.

An existing permanent service base in the Kenai area is assumed to support two-thirds of the rig activity during the exp" oration phase, two-thirds of all offshore activities during the deve" opment phase and all offshore activities during the production phase. In addition, a pipeline construction camp will be located in the Kenai area to complete one-half of all onshore pipeline construction.

Thus, the basic OCS employment onshore and offshore is distributed by function and task (Table 18) between the Central Peninsula area of the Kenai-Cook Inlet Census Division-Kenai area (Tables 14 and 15) and the Southern Peninsula area of the Kenai-Cook Inlet Census Division-Homer area (Tables 16 and 17).

TABLE 13

ASSUMPTIONS FOR THE DISTRIBUTION OF EMPLOYMENT
AMONG THE COASTAL AREAS OF KENAI AND HOMER
MEDIUM FIND SCENARIO
LOWER COOK INLET - SALE CI

Phase, Task and Area of Operations	Kenai	Homer
EXPLORATION		
Survey		
Offshore Geophysical and Geological Surveying [area of operation]	Not Applicable	Survey vessels conducting geophysical and geological surveys on tracts in Lower Cook Inlet outside the Kenai-Lower Cook Inlet coastal area.
Onshore Service Base	Not Applicable	Advance service base providing resupply and communications for vessels surveying the Lower Cook Inlet.
Rigs		
Offshore Exploration Well Drilling [area of operation]	Not Applicable	Rigs drilling exploration wells on the tracts in Lower Cook Inlet outside the Kenai-Lower Cook Inlet coastal area.
Marine Transport,ation [port area]	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs on the tracts in Lower Cook Inlet.	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs on the "tracts in Lower Cook Inlet.

Onshore Service Base	Existing permanent shore base supplying rigs and boats in Lower Cook Inlet with tubular materials, fuel, water, mud, cement, food and other cargo.	Advance shore base supply rigs and boats in Lower Cook Inlet and with fuel, “ water, mud, cement, food and other cargo.
Air Transportation	Not Applicable	Helicopter service from Homer Airport transporting offshore personnel and small volume, light weight freight to and from rigs in Lower Cook Inlet.
Construction	Not Applicable	Minor construction of an advance service base.
DEVELOPMENT		
<u>Platform Installation and Pipe Laying</u>		
Offshore Platform Installation [area of operation]	Not Applicable	Locating, installing and commissioning platforms in Lower Cook Inlet.
Pipeline Construction [area of operations]	Not Applicable	Laying and burying subsea gathering and trunk lines.
Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to platforms, lay barges and bury barges. Two-thirds of the efforts in platform installation and pipe laying will be provided from the Kenai area.	Supply/anchor/tug boats transporting materials to platforms, lay barges and bury barges. One-third of the effort in platform installation and pipe laying will be provided from Homer.
Onshore Service Base	Shore base supplying boats and platforms with tubular materials, fuel, water, food and other cargo. Two-thirds of the total effort for platform installation and pipe laying will be from the Kenai area.	Shore base supply, boats and platforms with tubular materials, fuel, water, food and other cargo. One-third of the total effort for platform installation and pipe laying will be provided from Homer.

Air Transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, light weight freight to platforms, lay barges and bury barges in Lower Cook Inlet.
Construction	Coating of all pipe used in subsea gathering and trunk pipelines. Constructing onshore oil and gas pipelines from Anchor Point to Nikiski. Fifty percent of the effort from the Kenai area.	Construction onshore oil and gas pipelines from Anchor Point to Nikiski. Fifty percent of the effort from the Homer area.
<u>Platforms</u>		
Offshore		
Development Drilling [area of operation]	Not Applicable	Development drilling on platforms in the Lower Cook Inlet.
Marine Transportation [port area]	Supply boats transporting materials to platforms in Lower Cook Inlet.	Supply boats transporting materials to platforms in Lower Cook Inlet.
Onshore		
Service Base	Shore base supplying boats and platforms with tubular materials, fuel, water, mud, cement, food and other cargo. Two-thirds of the effort will be provided from Nikiski.	Shore base supplying boats and platforms with fuel, water, mud, cement, food and other cargo. One-third of the effort will be provided from Homer.
Air Transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, light weight freight to platforms in Lower Cook Inlet.
PRODUCTION		
<u>Platforms</u>		
Offshore		
Platform Operations [area of operation]	Not Applicable	Operating platforms with workovers and well stimulation in Lower Cook Inlet.

Marine Transportation [port area]	Supply boats transporting materials to platforms in Lower Cook Inlet.	Not Applicable
Onshore Service Base	Shore base supply boats and platforms in the Lower Cook Inlet with tubular materials, fuel, water, mud, cement, food and other cargo.	Not Applicable
Air Transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, light weight freight to platforms in the Lower Cook Inlet.
Oil Terminal and LNG Plant Operations	The use of existing facilities in the Kenai area is assumed.	Not Applicable

Source: Alaska Consultants, Inc.

TA8LE 14

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - KENAI AREA
1979 - 1998

Year	Service '-Base	Helicopter Service: Exploration	Helicopter Service: Development	Helicopter Service: Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1979	5											5
1980	11											11
1981	11											11
1982	11											11
1983	11											11
1984	22											22
1985	22					83						105
1986	45					83			39			167
1987	40								58			98
1988	43											43
1989	41											41
1990	35											35
1991	41											41
1992	41											41
1993	41											41
1994	41											41
1995	41											41
1996	41											41
1997	30											30
1998	27											27

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 15

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - KENAI AREA
1979 - 1998

Year	Survey	Rigs	Platforms: Development Drilling	Platforms: Operations	Supply/Anchor/Tug Boats: Exploration	Supply/Anchor/Tug Boats: Development	Supply/Anchor/Tug Boats: Production	Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
1979					17					17
1980					35					35
1981					35					35
1982					35					35
1983					35					35
1984						31				31
1985						31				31
1986						64	6			70
1987						20	24			44
1988							36			36
1989							36			36
1990							36			36
1991							36			36
1992							36			36
1993							36			36
1994							36			36
1995							36			36
1996							36			36
1997							33			33
1998							24			24

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 16

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - HOMER AREA
1979 - 1998

Year	Service Base	Helicopter Service			Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
		Exploration	Development	Production								
1979	4	5										9
1980	7	10										17
1981	7	10										17
1982	7	10										17
1983	6	10										16
1984	11		3									14
1985	11		4			84						99
1986	23		7	3		84						117
1987	20		8	5								33
1988				15								15
1989				15								15
1990				15								15
1991				15								15
1992				15								15
1993				15								15
1994				15								15
1995				15								15
1996				15								15
1997				12								12
1998				10								10

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 17

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LONER COOK INLET (SALE CI) - HOMER AREA
1979 - 1998

Year	Survey	Rigs	Platforms: Development Drilling	Platforms: Operations	Supply/Anchor/Tug Boats: Exploration	Supply/Anchor/Tug Boats: Development	Supply/Anchor/Tug Boats: Production	Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
1979	17				9					82
1980	29	17!			17					158
1981	25	1?2			17					154
1982	29	112			17					158
1983	19	112			17					148
1984						15		146		161
1985			112			15		146		273
1986			224	33		32		146	72	507
1987			280	94		10			108	492
1988			243	232						475
1989			112	151						263
1990				149						149
1991				166						166
1992				181						181
1993				181						181
1994				181						181
1995				181						181
1996				181						181
1997				156						156
1998				131						131

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 18

EMPLOYMENT MULTIPLIER VALUES FOR THE KENAI-COOK INLET COASTAL AREA a/

ONSHORE (Applied to onshore-onsite employees in the Coastal Area) b/

Service Base	1.50
Helicopter Service - Exploration	1.10
Development	1.20
Production	1.50
Onshore Pipeline Construction	?.10
Pipe Coating	1.10

OFFSHORE (Applied to offshore employees assumed to be resident in the Coastal Area) c/

Survey	(Nil)	
Rigs	(10%)	1.50
Platforms - Development Drilling	(30%)	1.50
Operations	(70%)	1.50
Supply/Anchor/Tug Boats - Exploration	(20%)	1.50
Development	(30%)	1.50
Production	(80%)	1.50
Platform Installation	(lo%)	1.50
Offshore Pipeline Construction	(lo%)	1.50

a/ The coastal area is assumed to be the Kenai-Cook Inlet Labor Area. This area does not include any portion of the Lower Cook Inlet OCS lease sale area (Sale CI) which is in federal waters.

b/ The employment multiplier values are applied to the direct onshore-onsite employment in the coastal area.

c/ The employment multiplier values are applied only to the estimated portion of total offshore employment resident in the Kenai-Cook Inlet coastal area.

Source: Alaska Consultants, Inc.

All basic onshore-onsite employment is assumed to be resident employment of the local area of employment activity. However, the secondary employment supported by the onshore activities is assumed to vary considerably based upon the onshore activities in the respective areas. Thus, different multipliers are applied to the various groups of tasks (Table 18) to derive total employment (Tables 19 and 20). Total employment minus basic employment provides secondary employment.

OCS employees are technically not employees in the area under study. In fact, they are not even employees in the State since they are outside the State in federal waters. However, for purposes of analyzing impacts upon the study area, their place of residence is assumed as the location of basic employment. Therefore, percentages of offshore employment by task are assumed to reside within the Kenai-Cook Inlet Census Division. The percentages vary according to the function and phase of petroleum development (Table 18). A small percentage is assumed to be resident locally during the exploration phase. However, a larger part of the work force is assumed to be resident during the production phase. A common multiplier value of 1.50 (Table 18) is assumed for total offshore employment resident in the Kenai-Cook Inlet Census Division. Table 21 shows the forecast of total offshore OCS employment in the Kenai area while Table 22 exhibits the Homer area.

Population. Given the non-OCS forecast of population for the Kenai-Cook Inlet Census Division (Table 2), the OCS population as derived from the employment scenarios (Tables 19 and 20) indicates a modest

TABLE 19

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE 13) CENTRAL PENINSULA AREA (KENAI)
1980 - 1998

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1980	11	5	16		16	40	40
1981	11	5	16		16	40	40
1982	11	5	16		16	40	40
1983	11	5	16		16	40	40
1984	22	11	33		33	82	82
1985	105	19	124	83	41	102	185
1986	167	35	202	122	80	200	322
1987	98	26	124	58	66	165	223
1988	43	21	64		64	160	160
1989	41	21	62		62	155	155
1990	35	17	52		52	130	130
1991	41	21	62		62	155	155
1992	41	21	62		62	155	155
1993	41	21	62		62	155	155
1994	41	21	62		62	155	155
1995	41	21	62		62	155	155
1996	41	21	62		62	155	155
1997	30	15	45		45	112	112
1998	27	13	40		40	100	100

Source: Alaska Consultants, Inc.

TABLE 20

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - SOUTHERN PENINSULA AREA (HOMER)
1980 - 1998

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1980	17	4	21		21	52	52
1981	17	4	21		21	52	52
1982	17	4	21		21	52	52
1983	16	4	20		20	50	50
1984	14	5	19		19	48	48
1985	99	13	112	84	28	70	154
1986	117	17	134	84	50	125	209
1987	33	14	47		47	118	118
1988	15	7	22		22	55	55
1989	15	7	22		22	55	55
1990	15	7	22		22	55	55
1991	15	7	22		22	55	55
1992	15	7	22		22	55	55
1993	15	7	22		22	55	55
1994	15	7	22		22	55	55
1995	15	7	22		22	55	55
1996	15	7	22		22	55	55
1997	12	6	18		18	45	45
1998	10	5	15		15	38	38

Source: Alaska Consultants, Inc.

TABLE 21

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - CENTRAL PENINSULA AREA (KENAI)
1980 - 1998

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1980	19	10	29	72
1981	19	10	29	72
1982	19	10	29	72
1983	19	10	29	72
1984	25	13	38	95
1985		19	78	220
1986	1:;	69	208	512
1987	183	91	274	685
1988	257	129	386	965
1989	160	82	242	605
1990	171	85	256	640
1991	138	68	206	515
1992	148	74	222	555
1993	148	74	222	555
1994	148	74	222	555
1995	148	74	222	555
1996	148	74	222	555
1997	129	65	794	485
1998	106	53	159	398

Source: Alaska Consultants, Inc.

TABLE 22

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - SOUTHERN PENINSULA AREA (HOMER)
1980 - 1998

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1980	19	9	28	70
1981	19	9	28	70
1982	19	9	28	70
1983	19	9	28	70
1984	25	12	37	92
1985	58	20	88	222
1986	137	68	205	512
1987	182		274	685
1988	257	1 %	385	962
1989	161	81	242	605
1990	170	86	256	640
1991	137	69	206	515
1992	148	74	222	555
1993	148	74	222	555
1994	148	74	222	555
1995	148	74	222	555
1996	148	74	222	555
1997	129	64	193	482
1998	106	53	159	398

Source: Alaska Consultants, Inc.

increase in population from 1980 through 1998. For example, the OCS population of 234 added in the typical exploration year of 1981 represents an addition of approximately 1 percent to the non-OCS population of 24,690 forecast for that year. As OCS development peaks in 1988, a total of 2,124 persons are added to the non-OCS population of 30,018, or about 7 percent. And, during a typical year of the production phase (1994), 1,320 OCS-related people are added, or less than a 4 percent addition to the non-OCS population which is forecast to be 35,292.

However, as the population is allocated to the communities of study within the Kenai-Cook Inlet Census Division (Table 23), the population of 30 persons added at Kenai in the typical exploration year of 1981 (Tables 24 and 25) results in less than a 1 percent addition to the forecast non-OCS population of 4,819 (Table 3). In 1988, during the height of the development phase, 289 persons or an addition of approximately 5.5 percent is made to the non-OCS population forecast of 5,035 persons. During the typical production year of 1994, 186 persons or 3 percent, are added to the non-OCS forecast of 6,005 persons.

The OCS forecast results in a somewhat greater population impact on the City of Soldotna where 26 persons or 1 percent (Tables 24 and 25) are added to the non-OCS population forecast of 2,595 (Table 3) during the typical exploration year of 1981. The peak OCS population addition during the development phase year of 1988 is 273 people or 8 percent added to the non-OCS population base of 3,390 persons. The typical production phase year of 1994 would see the addition of 170 persons or 4 percent to the non-OCS base of 4,003 persons.

TABLE 23

PERCENTAGE ALLOCATION OF ESTIMATED OCS RELATED POPULATION
SELECTED KENAI-COOK INLET CENSUS DIVISION AREAS
1980 - 2000

	Offshore a/	Onshore b/
KENAI-SOLDOTNA AREA	100	100
City of Kenai	25	30
City of Soldotna	25	20
Remaining Area	50	50
HOMER AREA	100	100
City of Homer	50	50
Remaining Area	50	50

a/ Total offshore-related resident employment and population is assumed to be equally divided between the Kenai-Soldotna Area and the Homer Area. This employment and population includes onshore-related resident employment and population derived from the Afognak Island operations during the LCI Medium and High Find Scenarios.

b/ Total onshore related resident employment and population was derived from the various petroleum scenarios on an area specific basis. The resulting population is assumed to reside in the specific area of onshore employment.

Source: Alaska Consultants, Inc.

TABLE 24

ALLOCATION OF ESTIMATED POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENAR1O
LOWER COOK INLET (SALE CI) - CENTRAL PENINSULA AREA (KENAI)
1980 - 1998

Year	City of Kenai	city of Soldotna	Remaining Area	Total Central Peninsula Area
1980	12	8	20	40
1981	12	8	20	40
1982	12	8	20	40
1983	12	8	20	40
1984	25	16	41	
1985	31 a/	20 a/	134 a/	1:: a/
1986	60 a/	40 a/	222 a/	322 a/
1987	50 a/	33 a/	140 a/	223 a/
1988	48	32	80	160
1989	47	31	77	155
1990	39	26	65	130
1991	47	31	77	155
1992	47	31	77	155
1993	47	31	77	155
1994	47	31	77	155
1995	47	31	77	155
1996	47	31	77	155
1997	34	22	56	112
1998	30	20	50	100

a/ Construction camp population located outside the cities of Kenai and Soldotna.

Source: Alaska Consultants, Inc.

TABLE 25

ALLOCATION OF ESTIMATED POPULATION FROM OCS OFFSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - CENTRAL PENINSULA AREA (KENAI)
1980 - 1998

Year	City of Kenai	City of Soldotna	Remaining Area	Total Central Peninsula Area
1980	18	18	36	72
1981	18	18	36	72
1982	18	18	36	72
1983	18	18	36	72
1984	24	24	47	95
1985	55		110	220
1986	1 28	1:;	256	512
1987	171	171	343	685
1988	241	241	483	965
1989	151	151	303	605
1990	160	160	320	640
1991	129	129	257	515
1992	139	139	277	555
1993	139	139	277	555
1994	139	139	277	555
1995	139	139	277	555
1996	139	139	277	555
1997	121	121	243	485
1998	100	100	198	398

Source: Alaska Consultants, Inc.

TABLE 26

ALLOCATION OF ESTIMATED POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET (SALE CI) - SOUTHERN PENINSULA AREA (HOMER)
1980 - 1998

Year	City of Homer	Remaining Area	Total Southern Peninsula Area
1980	26	26	52
1981	26	26	52
1982	26	26	52
1983	25	25	50
1984	24	24	48
1985	35 a/	119 a/	154 a/
1986	63 a/	146 a/	209 a/
1987	59	59	118
1988	28	27	55
1989	28	27	55
1990	28	27	55
1991	28	27	55
1992	28	27	55
1993	28	27	55
1994	28	27	55
1995	28	27	55
1996	28	27	55
1997	23	22	45
1998	19	19	38

a/ Pipeline construction camps assumed to be located outside the City of Homer.

Source: Alaska Consultants, Inc.

TABLE 27

ALLOCATION OF ESTIMATED POPULATION FROM OCS OFFSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LowER COOK INLET (SALE CI) - SOUTHERN PENINSULA AREA (HOMER)
1980 - 1998

Year	city of Homer	Remaining Area	Total Southern Peninsula Area
1980	35	35	70
1981	35	35	70
1982	35	35	70
1983	35	35	70
1984	46		92
1985	111	1:!	222
1986	256	256	512
1987	343	342	685
1988	481	481	962
1989	303	302	605
1990	320	320	640
1991	258	257	515
1992	278	277	555
1993	278	277	555
1994	278	277	555
1995	278	277	555
1996	278	277	555
1997	241	241	482
1998	199	199	398

Source: Alaska Consultants, Inc.

The City of Homer, with a smaller population base and a greater individual share of the forecast OCS population assumed to reside there, is forecast to experience added OCS population in the typical exploration year of 1981 of61 persons (Tables 26 and 27) or somewhat less than 3 percent of the non-OCS population projected to be 2,229 persons (Table 4). During the peak year of 1988, 509 persons would be added as a result of OCS activities or 14 percent over the non-OCS population of 3,527. And, production phase employment during 1994 would average 306 persons or 7 percent of the forecast non-OCS population of 4,467.

Proposed Pacific Alaska LNG Plant

Employment. In order to portray the proposed Pacific Alaska LNG facility as an element in the Base Case of employment and population, a scenario involving only the construction and operations employment was developed. The facility as currently proposed by the Pacific Alaska LNG Company is assumed to have a capacity of 400 million cubic feet per day. The timing and direct employment required in the construction and operation of this facility were obtained from the Institute of Social and Economic Research, University of Alaska. These were used by ISER in the Lower Cook Inlet, State-wide and Regional Population and Economic Projections. Construction is forecast to take place beginning in 1980 and concluding with a finished plant during 1983. Production is assumed to begin in 1984 and to extend at full production beyond the year 2000 (Table 28).

TABLE 28

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENTBY TASK
NORTH KENAI LNG PLANT CONSTRUCTION AND OPERATIONS
KENAI AREA
1980-2000

Year	Service Base	Helicopter Service- Exploration	Helicopter Service- Development	Helicopter Service- Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1980								146				146
1981								B44				844
1982								1,323				1,323
1983								420				420
1984											60	60
1985											60	60
1986											60	60
1987											60	60
1988											60	60
1989											60	60
1990											60	60
1991											60	60
1992											60	60
1993											60	60
1994											60	60
1995											60	60
1996											60	60
1997											60	60
1998											60	60
1999											60	60
2000											60	60

Source: ISER/Alaska Consultants, Inc.

The basis for the construction of this plant is not vested with OCS gas production. It is assumed to utilize gas reserves from existing fields which are shut in and from future onshore and offshore fields brought into production by a more intensive development in upper Cook Inlet. However, as with Sale CI, it is an integral part of the foundation upon which the Lower Cook Inlet petroleum scenarios are constructed. The North Kenai LNG facility capacity is assumed as a portion of the total capacity available for the processing of natural gas critical to the high find scenario.

Since the supply of natural gas to this facility is not dependent upon a major find of Pacific Alaska LNG Company's making, the offshore and onshore employment involved in developing the gas reserves or transporting them to the plant are not included in this scenario. This employment is accounted for as part of the non-OCS employment where onshore and offshore reserves of upper Cook Inlet are utilized or OCS employment in the case of Sale CI.

The basic or direct employment forecast to be required to construct the Pacific Alaska LNG Company plant peaks in construction year 3 (1982) with an annual average full-time employment of 1,323 persons. The construction employment requirements forecast are typical for these large complex facilities. Year 1 (1980) is foreseen as a year of site preparation with foundation work being undertaken. Year 2 (1981) is seen as the year the liquefaction trains which cool and condense natural gas into liquid form are placed upon completed foundations. Year 3

(1 982) is seen to involve the major part of plumbing the facility and year 4 is forecast as the year in which construction is completed and the plant tested.

Production, which is forecast to begin during 1984, will require a relatively small work force of 60 employees. This operations employment is forecast to remain constant throughout the period of the forecast. Therefore, 60 employees are forecast to be employed from 1984 through 2000 in LNG plant operations.

The only employment tallied in this LNG plant scenario is onshore employment. Onshore employment by task is shown in Table 28 is direct employment. This provides a graphic indication of the scale of the facility and its operations, but is does not necessarily indicate employment related impacts upon the communities.

In this case, it is assumed that the impacts in this scenario will fall upon the Kenai area communities only. During the construction phase, it is assumed that the construction workforce will be composed almost exclusively of transient workers who are rotated through the Kenai-Cook Inlet area to their permanent residences outside. Furthermore, these employees are assumed to reside in construction camps on the site of the facility construction. These camps are seen to contain a wide range of amenities for comfortable living. Thus, excellent camps coupled with limited leisure time and scheduled rotation for employees are assumed to minimize impacts in the Kenai area. This is the basis for the assumption of a low multiplier of 1.10.

TABLE 29

ESTIMATED EMPLOYMENT AND POPULATION
NORTH KENAI LNG PLANT CONSTRUCTION AND OPERATIONS
CENTRAL PENINSULA AREA (KENAI)
1980 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1980	146	15	161	146	15	38	184
1981	844	84	928	844	84	210	1,054
1982	1,323	132	1,455	1,323	132	330	1,653
1983	420	42	462	420	42	105	525
1984	60	30	90		90	225	225
1985	60	30	90		90	225	225
1986	60	30	90		90	225	225
1987	60	30	90		90	225	225
1988	60	30	90		90	225	225
1989	60	30	90		90	225	225
1990	60	30	90		90	225	225
1991	60	30	90		90	225	225
1992	60	30	90		90	225	225
1993	60	30	90		90	225	225
1994	60	30	90		90	225	225
1995	60	30	90		90	225	225
1996	60	30	90		90	225	225
1997	60	30	90		90	225	225
1998	60	30	90		90	225	225
1999	60	30	90		90	225	225
2000	60	30	90		90	225	225

Source: Alaska Consultants, Inc.

On the other hand, all of the LNG plant operations employees are assumed to be permanent employees whose permanent residence is seen to be relatively close to the plant. Therefore, all LNG plant operations employees are forecast to live within the Kenai area. Since these employees are provided long-term, stable employment, the multiplier is assumed to be 1.50.

The multiplier for LNG plant construction and operations when applied to the direct employment for these tasks (Table 29) provide total employment. Total employment minus basic employment provides secondary employment.

Population. Given the direct construction employment, assumed to be transient, and permanent employment (direct and indirect), total population is der· veal. It is assumed that the dependency ratio for this largely immigrant petroleum-related employment will be more representative of national norms or somewhat lower than the Kenai-Cook Inlet area. Therefore, instead of a dependency ratio of 3 as currently exists, a ratio of 2.5 persons per employee is assumed. This ratio is applied to all permanent employment. Where direct construction employment is involved, this is added into the population without application of the dependency ratio. This is based upon the direct construction employees living without families in camps. Thus, despite employment peaking at 1,323 during 1982, the population peak is a modest 1,653 (Table 29).

The population resulting from the LNG facility is allocated within the Kenai-Soldotna area on an historical basis (Table 23) with the City of

TABLE 30

ALLOCATION OF ESTIMATED POPULATION
NORTH KENAI LNG PLANT CONSTRUCTION AND OPERATIONS
CENTRAL PENINSULA AREA (KENAI)
1980 - 2000

Year	City of Kenai	City of Soldotna	Remaining Area	Total Central Peninsula Area
1980	11 a/	8 a/	165 a/	184
1981	63 a/	42 a/	949 a/	1054
1982	99 a/	66 a/	1488 a/	1653
1983	32 a/	21 a/	472 a/	525
1984	68	45	112	225
1985	68	45	112	225
1986	68	45	112	225
1987	68	45	112	225
1988	68	45	112	225
1989	68	45	112	225
1990	68	45	112	225
1991	68	45	112	225
1992	68	45	112	225
1993	68	45	112	225
1994	68	45	112	225
1995	68	45	112	225
1996	68	45	112	225
1997	68	45	112	225
1998	68	45	112	225
1999	68	45	112	225
2000	68	45	112	225

a/ Construction camp population located outside the cities of Kenai and Soldotna.

Source: Alaska Consultants, Inc.

Kenai receiving 30 percent, the City of Soldotna 20 percent and the remaining area outside these two incorporated cities 50 percent. However, where a construction camp is located on a specific site, the population is assigned to that area and the remainder distributed according to the above percentages (Table 30). Therefore, the population impact during construction is biased toward the outside area where the camps are located. However, the fact that these enclaves are used serves to abate the effects of population impacts in the areas of the construction employment.

Upon the conclusion of the construction phase, the stable employment during the operations phase is not particularly large. Of the total of 225 persons, it is estimated that 68 will reside within the City of Kenai, 45 within the City of Soldotna and 112 in the remaining area.

Base Case Total Employment Forecast

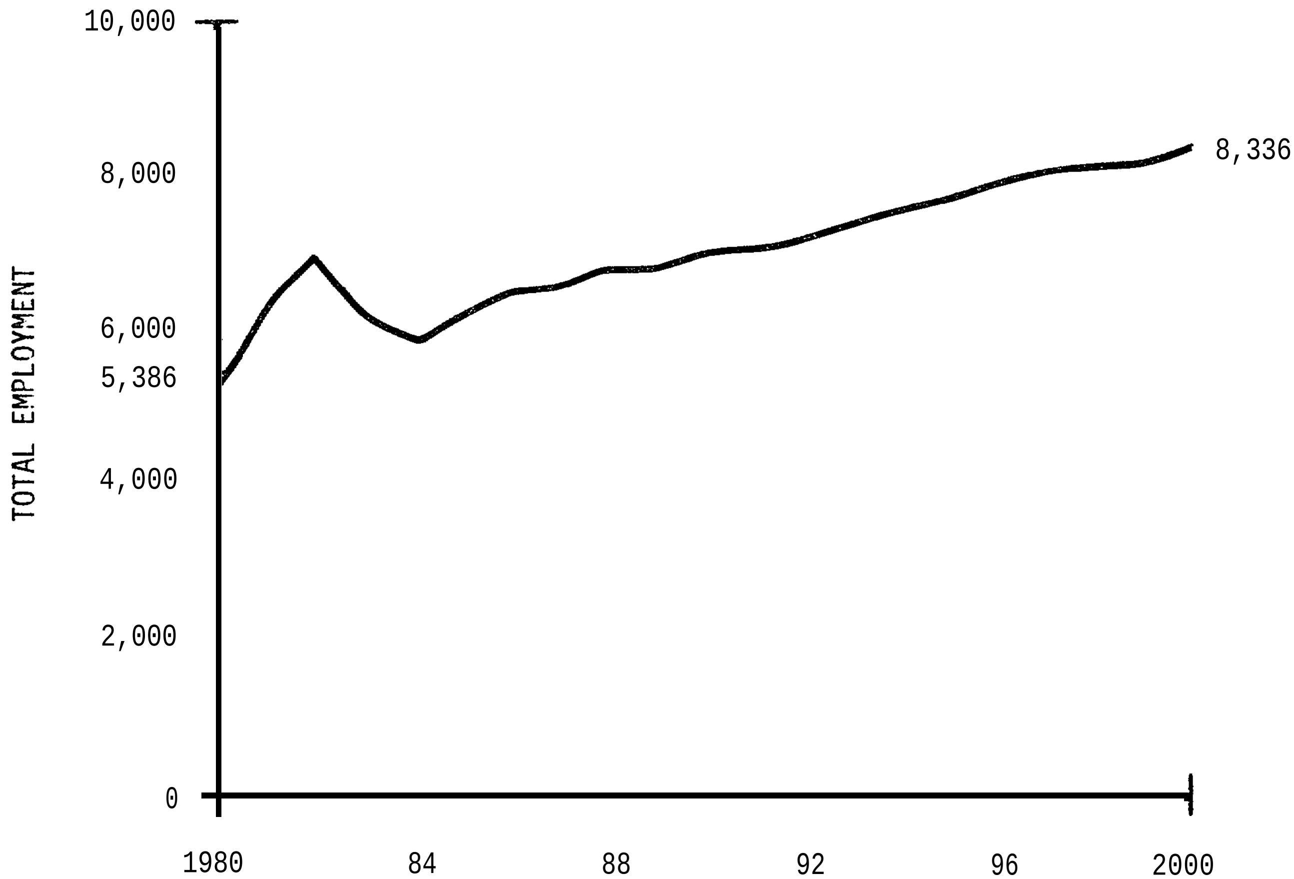
For purposes of forecasting future employment levels, an overall projection was first developed for the regional economy, that is, for the Kenai-Cook Inlet Census Division. Then, on the basis of past and anticipated economic trends, a share of the regional projection was assigned to the Kenai-Soldotna and Homer Labor Areas. Individual employment forecasts were not developed for each city in viewof the high work force mobility within the economic sub-areas and in view of the fact that resident population, not employment, was the critical variable for estimating community impacts. Separate population forecasts were developed for each city by distributing the population growth generated by the new employment in each area to their respective cities (Kenai and Soldotna or Homer) and their unincorporated hinterlands. The base case population forecasts provide the basis for the individual city's base case impact analysis.

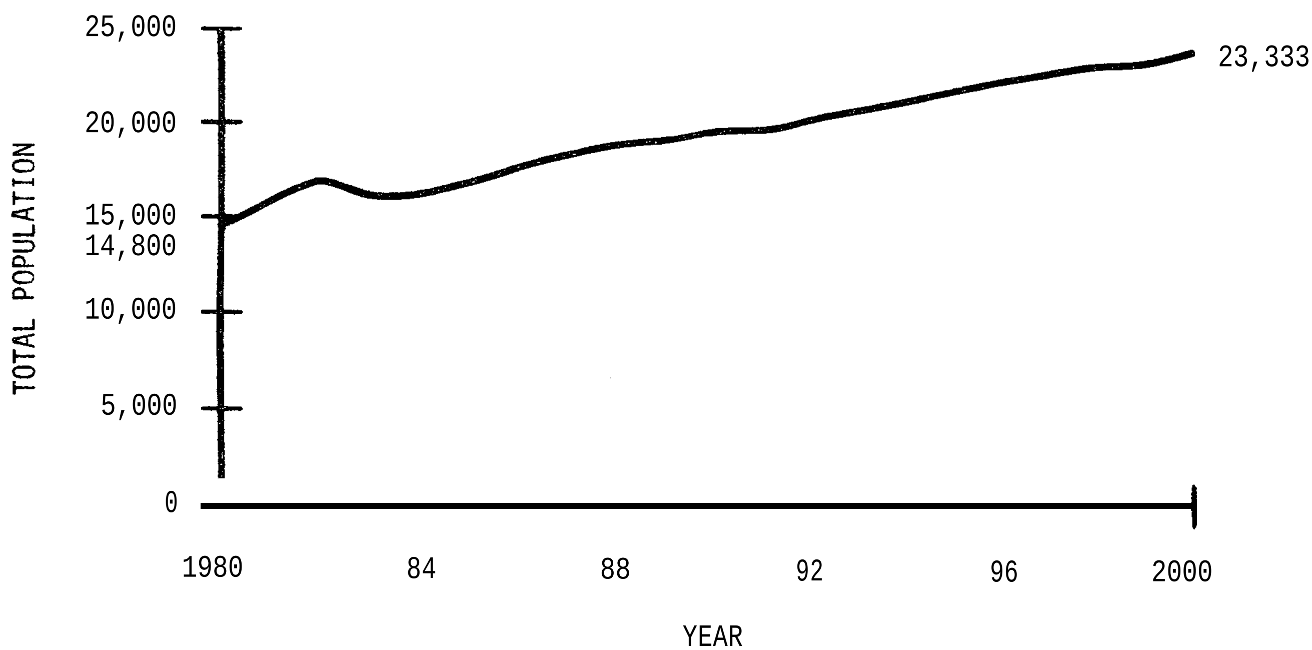
Kenai-Soldotna Labor Area. Base Case employment in the Kenai-Soldotna area is projected to increase from 5,386 jobs in 1980 to 8,336 jobs by 2000 (see Table 31). The pace of expansion is generally expected to be steady, with the exception of a strong surge in construction employment during the building of the proposed Pacific Alaska LNG plant scheduled for 1981-84. At peak, this project creates up to 1,323 direct jobs. Many of these short-term construction jobs are assumed to be filled by a temporary work force residing in camp facilities at the project site. Other noteworthy sectors of basic growth include continuing oil and gas development related to Sale CI and to other State leases and the transportation industry.

Homer Labor Area. The employment forecast for the Homer Area anticipates rapid, steady growth over the next two decades. Particularly strong advances are projected for the fishing and fish processing industry, partly as a result of exploitation of groundfish resources. The trade and services sector of the economy is expected to exhibit strong growth, due to expansion in Homer's tourism industry and diversification of the local service economy. Sale CI is potentially also a major growth factor: the medium find scenario assumed for that sale is estimated to

FIGURE 2

Kenai - Soldotna Area
Total Employment and Total Population
Base Case
Lower Cook Inlet
1980 - 2000

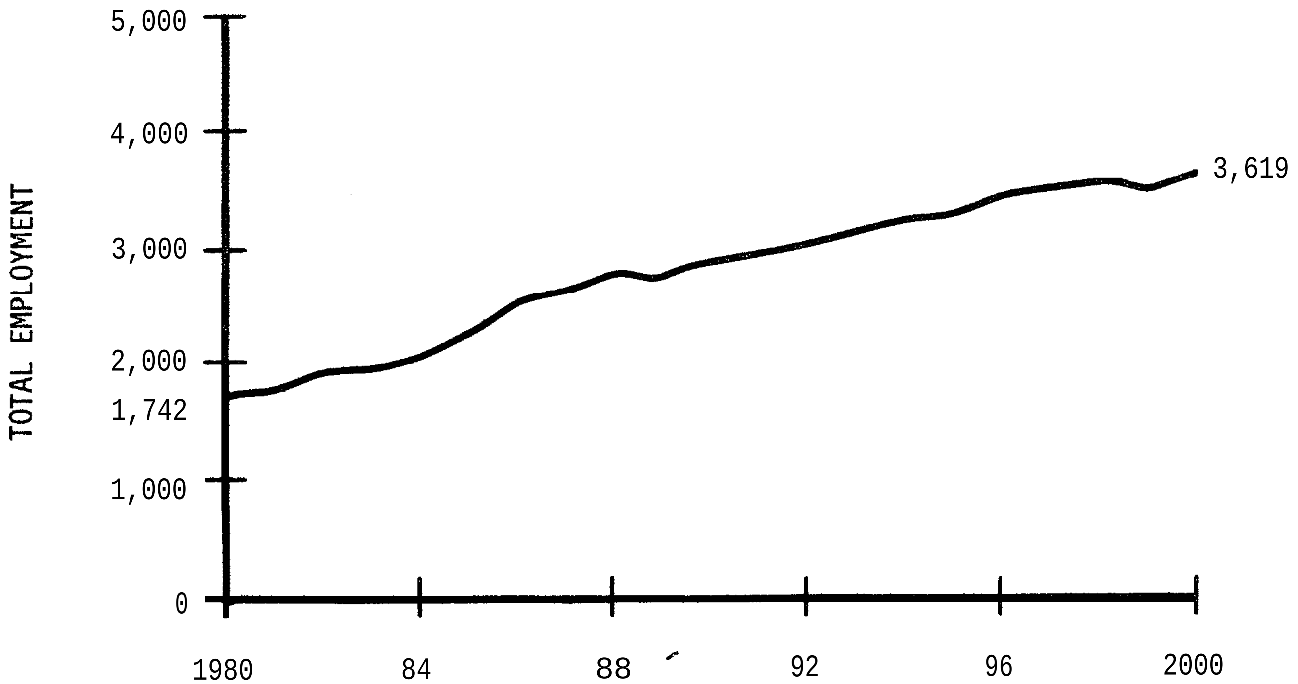


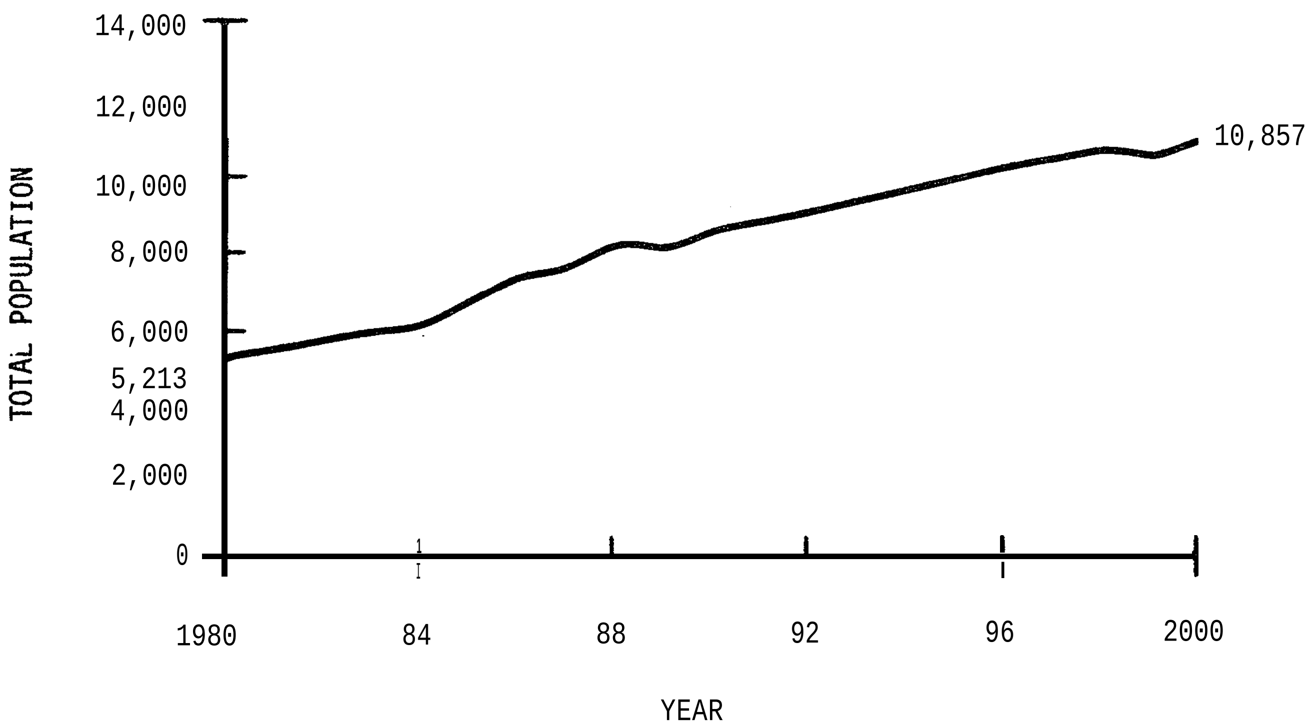


Source: Alaska Consultants, Inc.

FIGURE 3

Homer Area
Total Employment and Total Population
Base Case
Lower Cook Inlet
1980 - 2000





Source: Alaska Consultants, Inc. 76

TABLE 31

FORECAST OF EMPLOYMENT AND POPULATION
BASE CASE
LOWER COOK INLET - KENAI-SOLDOTNA AREA
1980 - 2000

	Kenai-Soldotna Area		City of Kenai	City of Soldotna	Remaining Kenai-Soldotna Area		
	Total Employment	Total Population	Total Population	Total Population	Total Population	Permanent Residents	Construction Camp Residents
1980	5,386	14,800	4,755	2,572	7,473	7,327	146
1981	6,269	15,994	4.912	2,663	8,419	7,575	844
1982	6,916	16,930	4; 982	2,821	9,127	7,804	1,323
1983	6,048	16,152	5,027	2,839	8,286	7,866	420
1984	5,829	16,272	5,116	3,021	8,135	8,135	
1985	6,100	16,864	5,268	3,123	8,473	8,390	
1986	6,431	17,674	5,407	3,369	8,898	8,776	1!;
1987	6,560	18,135	5,560	3,479	9,096	9,038	58
1988	6,751	18,741	5,662	3,708	9,371	9,371	
1989	6,750	18,782	5,694	3,697	9,391	9,391	
1990	6,906	19,217	5,734	3,875	9,608	9,608	
1991	7,018	19,543	5,838	3,935	9,770	9,770	
1992	7,190	20,020	5,980	4,031	70,009	10,009	
1993	7,351	20,471	6,115	4,122	10,234	10,234	
1994	7,523	20,952	6,259	4,218	10,475	10,475	
1995	7,692	21,425	6,401	4,313	10,711	10,711	
1996	7,871	21,927	6,552	4,413	10,962	10,962	
1997	8,001	22,304	6,668	4,484	11,152	11,152	
1998	8,148	22,728	6,800	4,565	11,363	11,363	
1999	8,140	22,765	6,830	4,553	11,382	11,382	
2000	8,336	23,333	7,000	4,667	11,666	11,666	

Source: Alaska Consultants, Inc.

TABLE 32

FORECAST OF EMPLOYMENT AND POPULATION
BASE CASE
LOWER COOK INLET - HOMER AREA
1980 - 2000

	Homer Area		City of Homer	Remaining Homer Area		
	Total Employment	Total Population	Total Population	Total Population	Permanent Residents	Construction Camp Residents
1980	1,742	5,213	2,148	3,065	3,065	
1981	1,814	5,429	2,290	3,139	3,139	
1982	1,897	5,678	2,450	3,228	3,228	
1983	1,976	5,916	2,610	3,306	3,306	
1984	2,068	6,191	2,793	3,398	3,398	
1985	2,295	6,700	3,055	3,645	3,561	84
1986	2,526	7,333	3,427	3,906	3,822	84
1987	2,602	7,688	3,707	3,981	3,981	
1988	2,799	8,214	4,036	4,178	4,178	
1989	2,763	8,178	4,090	4,088	4,088	
1990	2,892	8,558	4,280	4,278	4,278	
1991	2,924	8,679	4,341	4,338	4,338	
1992	3,028	8,983	4,493	4,490	4,490	
1993	3,120	9,259	4,631	4,628	4,628	
1994	3,215	9,544	4,773	4,771	4,771	
1995	3,313	9,838	4,920	4,918	4,918	
1996	3,416	10,147	5,075	5,072	5,072	
1997	3,487	10,373	5,187	5,186	5,186	
1998	3,561	10,612	5,306	5,306	5,306	
1999	3,501	10,503	5,252	5,251	5,251	
2000	3,619	10,857	5,429	5,428	5,428	

Source: Alaska Consultants, Inc.

generate as many as 407 jobs in the Homer area, about 14 percent of total local employment.

Overall, Homer area employment is forecast to more than double from 1,742 jobs in 1980 to 3,619 by 2000 (see Table 32).

Base Case Total Population Forecast

The sum of the non-OCS population forecast and the forecast for OCS Lease Sale CI and the North Kenai LNG facility for each year forecasted is equal to the Base Case forecast.

The Base Case forecast estimates population in the Kenai-Cook Inlet Census Division to be 41,607 persons in the year 2000 (Table 33). This is an increase of approximately 2.8 percent per year over the life of the forecast. Although this is a moderate growth rate, the Census Division increases by 77 percent from the 1979 population estimate of 23,552 (Table 8).

Within the Census Division study area, the City of Kenai is forecast to experience the slowest growth. It is expected to increase from the 1979 estimate of 4,604 people to 7,000 by 2000 (Table 34) or by approximately 2.0 percent per year. Although this is a reasonably low growth rate in Southcentral Alaska, it is forecast as a 52 percent increase in population by the year 2000.

The City of Soldotna's population growth is expected to be higher with an increase of approximately 3 percent per year forecasted. Soldotna is projected to increase from 2,479 persons in 1979 to 4,667 in 2000 (Table 34) for a total' increase of 88 percent.

The City of Homer is expected to experience the greatest rate of growth as forecast in the Base Case. Homer is expected to increase to approximately 5,429 people (Table 36) by the year 2000. This is an overall growth in excess of 150 percent since 1979. The population growth rate for the City of Homer is forecast to be 4.8 percent per yea r.

TABLE 33

FORECAST OF POPULATION
BASE CASE
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1980 - 2000

Year	Non-OCS Population	Sale CI Resident OCS-Offshore Population	Sale CI Resident OCS-Onshore Population	LNG Plant Resident Population	Total Population
1980	24,012	142	92	184	24,430
1981	24,690	142	92	1,054	25,978
1982	25,383	142	92	1,653	27,270
1983	26,094	142	90	525	26,851
1984	26,826	187	130	225	27,368
1985	27,582	442	339	225	28,588
1986	28,377	1,024	531	225	30,157
1987	29,184	1,370	341	225	31,120
1988	30,018	1,927	215	225	32,385
1989	30,885	1,210	210	225	32,530
1990	31,779	1,280	185	225	33,469
1991	32,619	1,030	210	225	34,084
1992	33,486	1,110	210	225	35,031
1993	34,362	1,110	210	225	35,907
1994	35,292	1,110	210	225	36,837
1995	36,225	1,110	210	225	37,770
1996	37,200	1,110	210	225	38,745
1997	38,205	967	157	225	39,554
1998	39,240	796	138	225	40,399
1999	40,299			225	40,524
2000	41,382			225	41,607

Source: Alaska Consultants, Inc.

TABLE 34

FORECAST OF POPULATION
BASE CASE
LOWER GOOK INLET - CITY OF KENAI
1980 - 2000

Year	Non-OCS Population	Sale CI Resident OCS-Offshore Population	Sale CI Resident OCS-Onshore Population	LNG Plant Resident Population	Total Population
1980	4,714	18	12	11	4,755
1981	4,819	18	12	63	4,912
1982	4,853	18	12	99	4,982
1983	4,965	18	12	32	5,027
1984	4,999	24	25	68	5,116
1985	5,114	55	31	68	5,268
1986	5,151	128	60	68	5,407
1987	5,271	171	50	68	5,560
1988	5,305	241	48	68	5,662
1989	5,428	151	47	68	5,694
1990	5,467	160	39	68	5,734
1991	5,594	129	47	68	5,838
1992	5,726	139	47	68	5,980
1993	5,861	139	47	68	6,115
1994	6,005	139	47	68	6,259
1995	6,147	139	47	68	6,401
1996	6,298	139	47	68	6,552
1997	6,445	121	34	68	6,668
1998	6,602	100	30	68	6,800
1999	6,762			68	6,830
2000	6,932			68	7,000

Source: Alaska Consultants, Inc.

TABLE 35

FORECAST OF POPULATION
BASE CASE
LOWER COOK INLET - CITY OF SOLDOTNA
1980 - 2000

Year	Non-OCS Population	Sale CI Resident OCS-Offshore Population	Sale CI Resident OCS-Onshore Population	LNG Plant Resident Population	Total Population
1980	2,538	18	8	8	2,572
1981	2,595	18	8	42	2,663
1982	2,729	18	8	66	2,821
1983	2,792	18	8	21	2,839
1984	2,936	24	16	45	3,021
1985	3,003		20	45	3,123
1986	3,156	1;:	40	45	3,369
1987	3,230	171	33	45	3,479
1988	3,390	241	32	45	3,708
1989	3,470	151	31	45	3,697
1990	3,644	160	26	45	3,875
1991	3,730	129	31	45	3,935
1992	3,816	139	31	45	4,031
1993	3,907	139	31	45	4,122
1994	4,003	139	31	45	4,218
1995	4,098	139	31	45	4,313
1996	4,198	139	31	45	4,413
1997	4,296	121	22	45	4,484
1998	4,400	100	20	45	4,565
1999	4,508			45	4,553
2000	4,622			45	4,667

Source: Alaska Consultants, Inc.

TABLE 36

FORECAST OF POPULATION
BASE CASE
LOWER COOK INLET - CITY OF HOMER
1980 - 2000

Year	Non-OCS Population	Sale CI OCS-Offshore Population	Sale CI OCS-Onshore Population	Total Population
1980	2,087	35	26	2,148
1981	2,229	35	26	2,290
1982	2,389	35	26	2,450
1983	2,550	35	25	2,610
1984	2,723		24	2,793
1985	2,909	1:!	35	3,055
1986	3,108	256	63	3,427
1987	3,305	343	59	3,707
1988	3,527	481	28	4,036
1989	3,759	303	28	4,090
1990	3,932	320	28	4,280
1991	4,055	258	28	4,341
1992	4,187	278	28	4,493
1993	4,325	278	28	4,631
1994	4,467	278	28	4,773
1995	4,614	278	28	4,920
1996	4,769	278	28	5,075
1997	4,923	241	23	5,187
1998	5,088	199	19	5,306
1999	5,252			5,252
2000	5,429			5,429

Source: Alaska Consultants, Inc.

Kenai

COMMUNITY FORECASTS - BASE CASE

Future Population

Over the period of the base case forecast, the City of Kenai's population is estimated to grow at a steady pace from about 4,755 in 1980 to about 7,000 by 2000, an increase of 47 percent (see Table 31). This is equivalent to an annual average growth rate of about 2 percent. By far the bulk of this population growth is attributed to economic events unrelated to Sale CI or the proposed Pacific Alaska LNG plant. At the beginning and close of the forecast, these two projects are very minor elements in Kenai's growth. In the middle years of the base case, when Sale CI activities peak and the new LNG plant begins operation, these projects momentarily inflate population by about 6 percent. Essentially, these noteworthy projects amount to a continuation of the growth trend that has characterized the City of Kenai for the recent decade or more rather than a departure from that trend.

IMPACT ASSESSMENT

Social Impacts

The economic and population growth forecast for the City of Kenai under the base case does not seem to portend any radical change in the social character of the community. Essentially, under this scenario, Kenai confirms its role as the center of Cook Inlet oil and gas development. The construction of the proposed LNG plant can be expected to foster a short-term economic boom, but even that event will echo the boom-bust pattern that has become familiar at Kenai in the course of its emergence as the primary scene of Alaska's oil and gas processing industries.

Impacts on Community Infrastructure

Housing and Residential Land. The general pattern of housing demand in Kenai under the base case scenario anticipates a steady demand for new housing units. Housing demand peaks from 1985 to 1988 coincident with the development phase for the CI Sale and the onset of production at the North Kenai LNG facility and again from 1992 to 1996 during the height of CI Sale onshore and offshore production (see Table 37).

The housing forecast for the base case estimates that there will be a net increase in demand of 663 housing units in the City of Kenai by 2000 for additional residents (see Table 37). Assuming-the continuation of historic patterns, slightly more than half of the increase will be accounted for by single family units, while multifamily units will account for about one-third of the total. Trailers will comprise about 15 percent of the housing unit demand.

According to the growth forecast, an estimated 51 hectares (126 acres) of undeveloped land will be required to accommodate residential expansion (see Table 38). A recent planning study (R.W. Thorpe and Associates, 1979) indicates that there are about 5,666 hectares (more than 14,000 acres) of undeveloped land in the City of Kenai. While some of this is in public hands or is undesirable because of poor soil conditions or flood hazards, there is more than adequate land, particularly in the outlying areas of the City, to absorb residential expansion with an ample reserve for commercial and other uses.

Utilities

- Water. In 1978, domestic water use accounted for roughly 75 percent of the total water consumed in the City of Kenai, while commercial use accounted for the remainder. For purposes of forecasting, it is assumed that this ratio will remain constant and that major industrial users will as at present continue to provide their own water. Water demand is estimated to increase approximately 40 percent during the forecast period (see Table 39). While existing pumping capacity and the distribution system, if extended, will be adequate to meet this demand, recent fluctuations in groundwater levels in the Kenai-North Kenai-Soldotna area are the cause of some concern. Extended and severe changes in groundwater levels combined with substantial growth in water consumption in the Central Peninsula area may necessitate development of an alternative to the current groundwater sources.

- Sewer. The City of Kenai's sewer system was thoroughly studied and a program of improvements recommended in the 1978 Wastewater Facilities Plan prepared by CH2M Hill. The City adopted the plan and is now implementing it. Apart from incremental extensions of the system to service new development, the plan recommends three basic improvements to the distribution system prior to 1985. These include central and west Kenai interceptors and several lift stations.

The sewage treatment plant has several reported defects. Although the plant's design capacity of 169 kiloliters (44,600 gallons) per hour peak flow is well above the City's current peak output of 126 kiloliters (33,300 gallons) per hour, there are occasions when infiltration and inflow overload the system. This is caused primarily by inefficient operation of the plant and poorly designed equipment, problems which are being addressed by the City.

The Wastewater Facilities Plan recommends a number of expansions and improvements to the treatment plant through the year 2000 to accommodate a peak flow in that year of 7,570 kiloliters (two million gallons) per day (315 kiloliters or 83,000 gallons an hour). Capacity requirements estimated for the base case will exceed this standard in 1986 (see Table 40). Thus, to meet base case requirements at the end of the forecast, additional capacity may be demanded.

- Electric Power. The Homer Electric Association, an REA consumer cooperative, provides electric power for the Kenai area, as well as most of the rest of the Kenai Peninsula. Power is purchased from Chugach Electric Association's gas turbine facilities at Beluga and Bernice Lake and from its hydro-electric facility at Cooper Landing. If the Corps of Engineers builds a hydro facility at Bradley Lake as planned, an additional 322 million kilowatt hours of electricity will be available to the area by 1987. Thus, it appears that as long as natural gas supplies last, HEA will have adequate power available to meet base case forecasts (see Table 41).

- Solid Waste Disposal. Commercial and residential garbage in Kenai is collected by a private contractor and hauled to one of two 12 hectare (30 acre) landfills in the area operated by the Kenai Peninsula Borough. Both dump sites are nearly filled to capacity and the Borough will have to locate new landfills in the next five years. Borough public works personnel have determined that about 0.4 hectare (one acre) is required to dispose of 8,028 cubic meters (10,500 cubic yards) of solid waste. In the base case, the estimated 579,387 cubic meters (757,765 cubic yards) of disposable solid waste to be generated from the City of Kenai during the forecast will consume roughly 29 hectares (72 acres) of landfill by the year 2000 (see Table 42). Landfill requirements for the remaining Central Peninsula area under the base case total approximately 65 hectares or 161 acres.

- Communications. The base case anticipates an increase in the number of telephone hook-ups at Kenai of about 53 percent, from 2,039 telephones in 1982 to about 3,111 hook-ups in the year 2000 (see Table 43). It does not appear that Glacier State Telephone Company, which provides telephone service to the Kenai area, should have any problem in maintaining adequate' service, although historically the company has been behind in adding new stations and delays were often encountered in phone installations.

Public Safety

- Police. The City of Kenai police department provides police services within the City, while law enforcement outside the City is the responsibility of the Alaska State Troopers. To maintain an adequate level of police service during the base case forecast, the City can expect to require at least five new police officers and five additional jail cells. Furthermore, if Kenai continues to provide jail facilities for both Soldotna and the Alaska State Troopers, an additional 30 cells will be demanded to accommodate growth in areas under the police jurisdiction of these two entities.

- Fire Protection. Provision of fire protection and emergency medical services in the City of Kenai is the responsibility of the Kenai fire department. Kenai's fire insurance rating varies from 6 to 9 depending on the availability of fire hydrants and distance from the fire station. Areas on the hydrant system and within 8 kilometers (5 miles) of the station have a rating of 6, while those areas more than 8 kilometers (5 miles) distant have a rating of 8 where hydrants are available and 9 where they are not. The City anticipates that the rating of the downtown area will be lowered to 5 when the new 11,355 kiloliter (3 million gallon) storage tank at the airport becomes operational. The new storage capacity will serve to meet fire flow requirements in newly developing areas.

With continuing growth in the northern and eastern sectors of town, the ability of the single centrally located fire station to maintain a satisfactory response time is declining. The planned construction of a substation at mile 5 on the Spur Highway will improve response time to the eastern reaches of the City, and a proposed substation near Wildwood will similarly reduce response time in outlying areas to the north.

The construction of the two new substations, the acquisition of required fire personnel and equipment, and the provision of additional water storage to meet fire flow requirements should ensure that Kenai's fire protection is adequate for the foreseeable future.

Health and Social Services. The Kenai-Soldotna area is large enough to require and support a diverse mix of medical facilities and professional services. Health facilities include the Borough-owned Central Peninsula General Hospital in Soldotna which serves the hospital needs of Kenai, North Kenai, Kasilof, Sterling, Cooper Landing and Soldotna; the Kenai Health Center operated by the State Department of Health and Social Services; and the Medical Center at Wildwood run by the Kenai Native Association for the area's Alaska Natives.

Based on the standard of three acute care beds for 1,000 population, the 30-bed Central Peninsula General Hospital is already short 14 beds for existing needs and, by the end of the forecast period, about 40 additional beds are likely to be demanded. However, recent hospital occupancy rates of about 30 percent suggest that this standard is too high, probably because area residents are seeking some hospital services outside the community. If this trend continues, the Central Peninsula General Hospital may require few, if any, new hospital beds during the base case forecast period.

Although hospital beds are adequate to accommodate a substantially larger population, both space and equipment for outpatient and emergency services are inadequate for existing needs. A proposal to expand these will go before service area voters in the fall of 1979 and, if approved, outpatient and emergency services should be adequate for the base case forecast period.

In 1979, there were ten doctors affiliated with the Central Peninsula General Hospital and practicing in the Kenai-Soldotna area. In addition, medical specialists visit regularly or are on call for assistance from Anchorage. Applying the standard of two physicians for a community of 3,000 plus another physician for each additional increment of 1,500 population, three to four more physicians are likely to be needed in the Kenai-Soldotna area by the year 2000. During the base case forecast period, no demand for new dentists is anticipated.

In general, by the standards adopted by the State of Alaska, the facilities and services available to the Kenai-Soldotna area, with the possible exception of the need for an alcohol and drug detoxification center, meet or exceed recommended levels and should be able to be expanded to meet new service loads anticipated under the base case.

Education. The City of Kenai is not directly responsible for financing and administering a local school district as the Kenai Peninsula Borough provides educational services on an areawide basis for the entire Borough. The school system is funded mainly through State contributions, supplemented by Borough revenues raised on an areawide basis. The Borough operates two elementary schools, a junior high school and senior high school in Kenai. The two elementary schools serve students from Kenai and Kalifonsky, while the junior' high school serves North Kenai as well as Kenai and Kalifonsky. The service area for the senior high school currently includes the City of Kenai and the communities of North Kenai, Soldotna, Kalifonsky, Kasilof, Sterling and

Cooper Landing, but with the completion of the new Soldotna high school in 1980, students from Soldotna, Kalifonsky, Sterling arid Cooper Landing will attend that facility, leaving the Kenai high school with a considerably smaller service area. However, it should be noted that the future enrollment trends used in this forecast are for the City of Kenai's students only and do not include students from other communities who may attend Kenai junior and senior high schools in the future.

For the purpose of the base case, it is assumed that students account for approximately 20 percent of the total population, with elementary students comprising 60 percent of the total and high school students (grades 7 through 12) accounting for the remaining 40 percent throughout the forecast period. Forecasts of capacity requirements are based on a ratio of 25 elementary students and 20 high school students per classrooms.

The school enrollment forecast for the base case envisions a relatively slow and steady growth throughout the period (see Table 44). Net growth in enrollment is about 30 percent, to about 840 elementary students and 560 high school students ·n the year 2000. A review of the present capacity and condition of the school facilities at Kenai indicates that Kenai is well equipped to accommodate such expansion. The two elementary schools have a total capacity of 41 classrooms, about 6 more classrooms than will be forecasted to be demanded under the base case. Kenai Junior High School and Kenai Central High together contain about 60 classrooms, more than double the number projected to be needed to meet base case secondary school enrollment forecasts. Kenai schools have been maintained in good condition and should remain in use throughout the forecast period.

Recreation. Kenai possesses a variety of major recreational facilities such as a swimming pool, gymnasiums, tennis courts, a hockey rink and ball fields that compare favorably with standards for a town its size. As in many Alaska communities, many of these are provided by the Borough school district even through the City retains the parks and recreation power. The major deficiency in Kenai's outdoor recreation facilities is the lack of neighborhood parks and play equipment for young children. By the end of the base case forecast, Kenai is expected to experience a demand for a total of 8 hectares (21 acres) to meet outdoor recreational needs. Indoor facilities that may be needed to meet base case recreational demands are an additional swimming pool and a community center.

Local Government Finances. In fiscal year 1978, the City of Kenai obtained most of its revenue from local sources. Property taxes (42 percent), sales taxes (26 percent) and a variety of service charges and miscellaneous other sources (8 percent) provided over three-fourths of the City's general fund income. Intergovernmental transfers, mainly from federal and State revenue sharing, accounted for the remaining 24 percent.

For the future, it is assumed that the City's revenues will grow at the same rate as its population grows. By this standard, the City's 1982 general revenue fund income estimate of $3,560,000 annually is forecast to climb to about $5,000,000 by 2000 (see Table 45).

As for operating expenditures, under the base case, it is assumed that the City of Kenai will continue to maintain about the same level of services at about the same level of per capita cost as it does at present (see Table 46). Only about one-third of the projected growth in the Central Peninsula area under the base case is allotted to Kenai so the brunt of the fiscal impact of growth on the City will be somewhat mitigated. Fiscal impact will be further tempered by the fact that the Borough government administers and funds the local share of educational services as well as certain other areawide services such as garbage disposal and hospital services. In addition, certain utility services in Kenai, such as power and telephone are financed through independent public and private utilities.

At present, the City's general financial position in terms of its per capita debt, ratio of debt to valuation, property valuation per capita, property tax rates and other indexes of fiscal soundness are about equal to or poorer than the average of other Alaskan municipalities. This suggests that Kenai may have some difficulty financing future capital improvements within its existing fiscal framework and may, instead, have to rely on State and federal grants to finance new facilities or develop new revenue sources.

CAUSE/EFFECT OF IMPACTS

Under the base case, growth impacts at Kenai are expected to stem from consolidation of its position in the economic functions that now support the community. Continuing economic growth is forecast, but with no noteworthy sudden departures from recent economic trends. The Kenai area will maintain its oil and gas and petrochemical base, drawing upon existing and yet-to-be proven hydrocarbon reserves anticipated from new State leases and Sale CI. An additional LNG plant will be constructed as scheduled. Expanded commercial fisheries and fish processing and tourism industries are expected to support some growth.

The pace of population growth, estimated to average about 2 percent annually, is even slower than during the post-1970 period and is quite different from the explosive growth pattern of the 1960-70 decade. In sum, the base case projection envisions a diminished rate of economic and population growth for the City of Kenai.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

The projected base case growth is not expected to generate any exceptional growth-related burdens on Kenai's municipal facilities and services. The relatively easy pace of town growth since 1970 has enabled Kenai to catch up with the backlog of municipal needs that accumulated during the hectic expansion of the 1960's. Now, Kenai is generally better positioned to absorb without disruption such growth impacts as may occur in conjunction with another LNG plant project, Sale CI and other anticipated developments. On the whole, the forecast gradual growth is expected to generate demand for such routine improvements as expanded water supply, minor improvements and corrections to the sanitary waste system, a new landfill site and additional fire station and recreational facilities.

SUMMARY OF IMPACTS

In contrast to its status in the boom years during the initial phase of Cook Inlet oil and gas development, Kenai has now matured into a relatively broad-based community with a developed infrastructure in relation to the growth demands likely to be placed upon it in the next two decades under the base case. Therefore, it is not expected that Kenai will be facing growth impacts of stressing proportions.

TABLE 37

FORECAST OF NET CHANGE IN HOUSING DEMAND
BASE CASE
CITY OF KENAI
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	70	22	11	7	4
1983	45	14	7	5	2
1984		28	15	9	4
1985	1:;	48	25	16	7
1986	139	44	23	14	7
1987	153	49	26	16	7
1988	102	32	17	10	5
1989	32	10	5	3	2
1990	40	13	7	4	2
1991	104	33	17	11	5
1992	142	45	23	15	7
1993	135	43	22	14	7
1994	144	46	24	15	7
1995	142	45	23	15	7
1996	151	48	25	16	7
1997	116	37	19	12	6
1998	132	42	22	14	6
1999		10	5	3	2
2000	1;;	54	28	18	8
TOTALS	2,088	663	344	217	102

Source: Alaska Consultants, Inc.

TABLE 38

ESTIMATED DEMAND FOR RESIDENTIAL LAND
BASE CASE
CITY OF KENAI
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	58	10.4	4.1	14.5
Multifamily & Trailer	54	4.9	1.9	6.8
1986-90				
Single Family	78	14.0	5.5	19.5
Multifamily & Trailer	70	6.3	2.4	8.7
1991-95				
Single Family	109	19.6	7.6	27.2
Multifamily & Trailer	103	9.3	3.6	72.9
1996-2000				
Single Family	99	17.8	6.9	24.7
Multifamily & Trailer	92	8.3	3.2	11.5
TOTAL	663	90.6	35.2	125.8

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 39

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
BASE CASE
CITY OF KENAI
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
982	623	224	847
983	628	226	854
i 984	640	230	870
1985	658	237	895
1986	676	243	919
1987	695	250	945
1988	708	255	963
1989	712	256	968
1990	717	258	975
1991	730	263	993
1992	748	269	1,017
1993	764	275	1,039
1994	782	282	1,064
1995	800	288	1,088
1996	819	295	1,114
1997	834	300	1,134
1998	850	306	1,156
1999	853	307	1,160
2000	875	315	1,190

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 40

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
BASE CASE
CITY OF KENAI
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	847	'105.9
1983	854	106.8
1984	870	108.8
1985	895	111.9
1986	919	114.9
1987	945	118.1
1988	963	120.4
1989	968	121.0
1990	975	121.9
1991	993	124.1
1992	1,017	127.1
1993	1,039	129.9
1994	1,064	133.0
1995	1,088	136.0
1996	1,114	139.2
1997	1,134	141.8
1998	1,156	144.5
1999	1,160	145.0
2000	1,190	148.8

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 41

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
BASE CASE
KENAI AREA
1982- 2000

Year	Estimated Capacity Requirements in kw's
1982	23,301
1983	20,761
1984	29,835
1985	30,654
1986	31,292
1987	31,674
1988	31,882
1989	32,002
1990	32,152
1991	32,542
1992	33,075
1993	33,581
1994	34,121
1995	34,654
1996	35,220
1997	35,655
1998	36,150
1999	35,612
2000	36,250

Source: Alaska Consultants, Inc.

TABLE 42

ESTIMATED DISPOSABLE SOLID WASTES
BASE CASE
CITY OF KENAI
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	6,494	38,971
1983	5,579	33,425
1984	5,313	32,095
1985	5,706	34,272
1986	6,023	35,948
1987	6,181	36,796
1988	6,320	37,432
1989	6,413	37,995
1990	6,511	38,589
1991	6,632	39,322
1992	6,786	40,256
1993	6,933	41,147
1994	7,090	42,098
1995	7,245	43,037
1996	7,409	44,031
1997	7,470	44,690
1998	7,611	45,544
1999	7,508	45,498
2000	7,693	46,619

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 43

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
BASE CASE
CITY OF KENAI
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	1,581	2,039	43
1983	1,595	2,074	35
1984	1,623	2,126	52
1985	1,671	2,206	80
1986	1,715	2,281	75
1987	1,764	2,364	83
1988	1,796	2,425	61
1989	1,806	2,456	31
1990	1,819	2,492	36
1991	1,852	2,556	64
1992	1,897	2,637	81
1993	1,940	2,716	79
1994	1,986	2,780	64
1995	2,031	2,843	63
1996	2,079	2,911	68
1997	2,116	2,962	51
1998	2,158	3,021	59
1999	2,168	3,035	14
2000	2,222	3,111	76

Source: Alaska Consultants, Inc.

TABLE 44

SCHOOL ENROLLMENT FORECAST
BASE CASE
CITY OF KENAI
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	598	398	996
1983	603	402	1,005
1984	614	409	1,023
985	632	422	1,054
986	649	432	1,081
987	667	445	1,112
988	679	453	1,132
989	683	456	1,139
990	688	459	1,147
991	701	467	1,168
1992	718	478	1,196
1993	734	489	1,223
1994	751	501	1,252
1995	768	512	1,280
1996	786	524	1,310
1997	800	534	1,334
1998	816	544	1,360
1999	820	546	1,366
2000	840	560	1,400

Source: Alaska Consultants, Inc.

TABLE 45

GENERAL FUND
REVENUE FORECAST
BASE CASE
CITY OF KENAI
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$1,504	$ 943	$ 838	$ 275	$3,560
1983	1,517	952	846	278	3,593
1984	1,544	968	861	283	3,656
1985	1,590	997	886	291	3,764
1986	1,632	1,024	910	299	3,865
1987	1,678	1,053	936	307	3,974
1988	1,709	1,072	953	313	4,047
1989	1,719	1,078	958	315	4,070
1990	1,731	1,085	965	317	4,098
1991	1,762	1,105	982	323	4,172
1992	1,805	1,132	1,006	331	4,274
1993	1,846	1,158	1,029	338	4,371
1994	1,889	1,185	1,053	346	4,473
1995	1,932	1,212	1,077	354	4,575
1996	1,978	1,240	1,102	362	4,682
1997	2,013	.1,262	1,122	369	4,766
1998	2,053	1,287	1,144	376	4,860
1999	2,062	1,293	1,149	378	4,882
2000	2,113	1,325	1,178	387	5,003

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 46

FORECAST OF REVENUES AND OPERATING EXPENDITURES
BASE CASE
CITY OF KENAI
1982 - 2000
$1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$3,560	$2,469	$1,091
1983	3,593	2,491	1,102
1984	3,656	2,535	1,121
1985	3,764	2,611	1,153
1986	3,865	2,680	1,185
1987	3,974	2,755	1,219
1988	4,047	2,806	1,241
1989	4,070	2,822	1,248
1990	4,098	2,842	1,256
1991	4,172	2,893	1,279
1992	4,274	2,964	1,310
1993	4,371	3,030	1,341
1994	4,473	3,102	1,371
1995	4,575	3,172	1,403
1996	4,682	3,247	1,435
1997	4,766	3,305	1,461
1998	4,860	3,370	1,490
1999	4,882	3,385	1,497
2000	5,003	3,469	1,534

a/ The City of Kenai does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Soldotna

COMMUNITY FORECASTS - BASE CASE

Future Population

Considering all sources of growth, the base case population of the City of Soldotna is estimated to increase from about 2,572 in 1980 to about 4,667 by 2000, an increase of 81 percent (see Table 31). Except for minor flutters caused by Sale CI and the LNG project, Soldotna is expected to maintain a steady upward trend, averaging an annual growth rate of about 3 percent over the two decades of the forecast. Thus, Soldotna is projected to grow at a somewhat faster rate than Kenai.

Soldotna attracts new residents from Sale CI and the new LNG plant in absolute numbers about equal to Kenai but, because of its lesser population base, these projects assume a somewhat larger role in Soldotna's growth pattern. This is especially so in the middle years of the forecast, when the employment bulge associated with these projects causes a short-term bulge in Soldotna's population trend. Nevertheless, over the full term of the forecast, the impact of Sale CI and the LNG project are far outweighed by other growth factors in Soldotna's future.

IMPACT ASSESSMENT

Social Impacts

The social impact of the base case scenario upon Soldotna appears likely to be neutral. This scenario does not portend any significant change in Soldotna's economic structure, but a continuation of its role as a governmental and commercial center and as a bedroom community for its more industrialized vicinity. Foreseeable is a gradual transition in scale to a more urban type of settlement due to the cumulative effect of population growth.

Impacts on Community Infrastructure

Housing and Residential Land. In Soldotna, the base case forecast estimates that 608 additional dwellings will be demanded by 2000 to house population growth. The need for new housing is heaviest during the mid-1980's during a period when the basic growth trend is augmented by onshore and offshore CI Sale development and the start-up of production at the LNG facility in North Kenai. Mild interruptions to the increase in housing demand occur in 1989 following the completion of the CI Sale development phase and in 1999 when CI Sale production is scheduled to phase out (see Table 47).

Assuming that the future demand for housing types resembles today's pattern, about 56 percent of the demand (344 units) will be single family units, about 16 percent (99 units) will be multifamily and the remaining 28 percent (168 units) will be trailers.

It is estimated that about 48 hectares (119 acres) of undeveloped land will be demanded to accommodate new residential development in Soldotna (see Table 48). With only about one-third of the land inside the City's corporate limits in use in 1979 (Ted Forsi and Associates, 1979), there appears to be sufficient land available for future expansion.

Utilities

- Water. Soldotna's municipal water system was first constructed in 1972 and has been expanded yearly since that time. Total pumping capacity at the City's three wells amounts to 7,570 kiloliters (about 2 million gallons) per day, well in excess of current and anticipated base case demands of 3,354 kiloliters (886,000 gallons) per day for the year 2,000 (see Table 49).

  Since water is not metered and records of wellhouse production have not been maintained consistently in Soldotna until recently, City water officials have no accurate measure of actual water consumption. In the past, groundwater supply has been adequate to meet demand and the recent addition of a new well should insure that water supply is adequate for at least the near term. The sufficiency of Soldotna's groundwater supply, as opposed to pumping capacity, over the long term is the subject of some concern with Borough planning officials as groundwater levels in the Central Peninsula area have experienced fluctuations in recent years. Extented and severe fluctuations in groundwater levels combined with substantial growth in the Central Peninsula Area may necessitate the development of additional or alternative water sources.

Sewer. Soldotna's sewer system was thoroughly studied and a program of improvements recommended in the 1977 Wastewater Facilities Plan and its 1979 amendment. The City adopted the plan and is now implementing it. Aside from incremental extensions of the system to service new development, only minor improvements to the collection system are anticipated to meet base case demands. These include expansion of the existing 25.4 centimeter (lO-inch) line connecting to the treatment plant and the addition of lift stations to prevent build-up of sludge in the distribution system.

Both" daily average and peak flows through Soldotna's treatment facility are well above the plant's design standard. The Wastewater Facilities Plan and amendment recommended modification and expansion of the plant in two phases to meet projected capacity requirements through 1998. Phase I, scheduled for completion in 1981, is designed to serve a population of 6,200 in 1988 and process a peak daily flow of

3,785 kiloliters (one million gallons). Phase II expansion will double the plant's 1988 capacity to 7,570 kiloliters (two million gallons) per day and serve a projected 1998 population of 16,000.

Daily capacity requirements for the base case for the year 2000 are 3,354 kiloliters (886,000 gallons), slightly less than the capacity planned for the treatment plant at the end of Phase I expansion. Consequently, it appears that even without the Phase II project, Soldotna will have excess treatment capacity throughout the base case forecast period (see Table 50).

- Electric Power. The Homer Electric Association, an REA consumer cooperative, provides electric power for the Soldotna area, as well as for most of the rest of the Kenai Peninsula. Power is purchased from Chugach Electric's gas turbine facilities at Beluga and Bernice Lake and from its hydro-electric facility at Cooper Landing. A Corps of Engineers hydro-electric facility proposed for construction at Bradley Lake will provide an additional 322 million kilowatt hours of electrictiy to the area by 1987. Thus, it appears that as long as natural gas supplies last, there will be adequate electric power generation capacity to meet base case demands in Soldotna (see Table 51).

- Solid Waste Disposal. Commercial and residential garbage in the City of Soldotna is collected by a private contractor and hauled to one of two 12-hectare (30 acre) landfills in the area operated by the Kenai Peninsula Borough. These same dump sites are also used to dispose of solid waste from other Central Peninsula communities. Both landfills are nearly filled and the Borough will have to locate new landfills in the next five years. Public works personnel have determined that about 0.4 hectares (one acre) are needed to dispose of 8,028 cubic meters (10,500 cubic yards) of disposable solid waste. In the base case, the estimated 363,296 cubic meters (475, 145 cubic yards) of disposable solid waste to be generated by Soldotna during the forecast period will require roughly 18 hectares (45 acres) of landfil 1 (see Table 52).

- Communications. During the base case forecast, the number of telephone hook-ups in Soldotna is estimated to increase about 80 percent, from about 1,103 hook-ups in 1982 to 1,981 in the year 2000 (see Table 53). It does not appear that Glacier State Telephone Company, which provides telephone service to the Central Peninsula area, should have any problem maintaining adequate service for this level of growth.

Public Safety

- Police. The Soldotna police department provides police protection inside the Soldotna City limits and outside the City to mile 90 on the Sterling Highway, to mile 20 on the Kalifonsky Beach Road and to mile 2 on the Kenai Spur Road. Unincorporated areas outside this perimeter are served by Alaska State Troopers stationed in Soldotna. The police department is currently staffed by a chief and seven commissioned officers. To maintain an adequate level of police protection, four to five new police officers will be called for under the base case forecast.

  The Soldotna police station includes two temporary holding cells appropriate for only short term incarceration. Consequently, prisoners requiring detention of any duration are accommodated in the Kenai jail. Assuming this practice is continued throughout the base case forecast, a demand for an additional four to five cells is foreseen at the Kenai facility to meet Soldotna's needs during the base case.

- Fire Protection. Fire protection and emergency medical services in Soldotna are provided by the Soldotna volunteer fire department. The department is staffed by four salaried firemen and about 15 volunteers. Service is provided throughout the City and, under contract, to State land within a 6.5

kilometer (four mile) radius of the City. Soldotna's ISO rating of 6 depends on the presence of fire hydrants. Residential areas outside the hydrant system have a rating of 7, while commercial properties outside the system are rated on the merits of the property.

Soldotna's fire protection service has several deficiencies. One is the excessively long run to outlying areas of the City often not equipped with fire hydrants. With continuing growth in the outlying reaches of town, particularly along the Sterling Highway to the north and in the vicinity of the airport across the river, the ability of the single fire station to maintain good response time is declining.

The distribution of fire hydrants is also inadequate, particularly in the commercial sections of town. In the spring of 1979, a bond issue was proposed to expand and upgrade the hydrant system, but this proposal was turned down by local voters.

The fire department's pumping capacity is adequate for a city of Soldotna's size. However, because of limited water storage, peak capacity cannot be sustained over an extended period. The City has obtained a Coastal Energy Impact Program grant to design a second 1,892 kiloliter (500,000 gallon) reservoir. Construction is expected within the next five years.

In sum, to meet fire protection needs during the base forecast, the City may have to construct two new substations, obtain the additional personnel and equipment to operate them, upgrade the water and hydrant system and expand water storage capacity to meet fire flow requirements.

Health and Social Services. Soldotna residents are fortunate to have available within their area a broad mix of medical facilities and professional services. Health facilities include the Borough-owned Central Peninsula General Hospital which serves the hospital needs of Kenai, North Kenai, Kasilof, Sterling and Cooper Landing as well as Soldotna; the Kenai Health Center in Kenai operated by the State Department of Health and Social Services; and the Medical Center at Wildwood run by the Kenai Native Association for the area's Alaska Natives.

Based on the standard of three acute care beds for each 1,000 population, the 30-bed Central Peninsula General Hospital today has 14 fewer beds than needed to meet existing service area demands and, by the end of the base case forecast period, is projected to require about 30 additional beds. However, recent hospital occupancy rates of about 30 percent suggest that this standard is too high, probably because area residents are seeking at least some hospital services outside the community. If this trend continues, it is expected that the Central Peninsula General Hospital will need few, if any, new hospital beds during the base case forecast.

a

Although hospital bed capacity is adequate to accommodate a substantially larger population, both space and equipment for outpatient and emergency services are inadequate for existing needs. A proposal to expand outpatient and emergency service facilities will go before service area voters in the fall of 1979. If the proposed improvements are made, outpatient and emergency services should be adequately equipped for the base case forecast period.

In 1979, there were ten doctors affiliated with the Central Peninsula General Hospital and practicing in the Soldotna area. In addition, medical specialists visit regularly or are on call for assistance from Anchorage. An estimated three to four additional physicians may be needed in the Soldotna area to maintain a standard level of medical care during the base case. The seven dentists currently practicing in the area should be sufficient for base case needs.

Education. Because the Kenai Peninsula Borough provides educational services on an areawide basis for the entire Borough, the City of Soldotna is not responsible for financing and administering a local school district. The Borough school system is funded primarily through State contributions, but the Borough contributes some funds raised on an areawide basis. The Borough operates two elementary schools and a junior high school in Soldotna. The elementary schools house students from Soldotna only, while the junior high school serves students in grades 7 through 9 from Soldotna and Kasilof. Until 1980 when the new high school is completed, Soldotna students in grades 10 through 12 will attend school in Kenai.

The new high school will house grades 9 through 12 from Soldotna, Sterling, Kasilof and Funny River and the junior high will be reorganized to accommodate grades 7 and 8 only.

While it is anticipated that Soldotna junior and senior high schools will continue to accept students from outside the community, the base case enrollment estimates and capacity requirements used in this forecast only take into account students resident in the City of Soldotna.

Soldotna school enrollments for the base case are projected to grow steadily throughout the forecast period (see Table 54). Net growth in enrollment is about 65 percent, to 560 elementary and 373 high school students in the year 2000. A review of the present capacity and condition of the school facilities at Soldotna indicates that Soldotna is well equipped to accommodate such expansion. The two elementary schools have a total of 48 classrooms, about double the number expected to be needed to house enrollments forecast for the base case. The Soldotna junior and senior high schools together contain about 64 classrooms, more than three times the number expected to be needed to meet secondary enrollments. Soldotna school plants are new and well maintained and, thus, should be useful throughout the forecast period.

Recreation. Although the Soldotna area possesses an abundance of outdoor recreation resources used by residents and visitors alike, outdoor facilities provided by the City are limited and are designed primarily for use by visitors rather than local residents. The only neighborhood park in the City is the Jack Farnsworth Memorial Park on Birch Lane. Portions of Centennial Park given over to ballfields and the City Fairgrounds are heavily used by Soldotna residents. The City does not. provide any indoor recreation facilities or activities.

As in many Alaska communities, the public schools in Soldotna provide a focal point for both outdoor and indoor recreational activities. The three multipurpose rooms in Soldotna's elementary and junior high schools are available during non-school hours for community athletic programs. Facilities to be included in the new high school will substantially enlarge the recreation opportunities for local residents. The new high school will house a swimming pool, an 800-seat auditorium, a gym and a multi-use room, all of which will be available for public use. With the completion of the new school, Soldotna will have more than adequate indoor recreation capacity for base case needs. Although provision of a community center is normally demanded for a town this size, the new auditorium and excess capacity in the school plants may accommodate some of the functions usually incorporated in a community center and thereby postpone the necessity for the City to provide a community center.

Local Government Finances. As of 1978, nearly five-sixths of Soldotna's general fund revenues were raised locally from property taxes (29 percent), local sales tax (30 percent) and miscellaneous other local revenue sources (24 percent). Only about 17 percent of general fund revenues were derived from intergovernmental transfers. Since 1974, the City's mill rate has fallen considerably from 20.20 to 16.10 mills, a trend which is probably related to a period of rapid expansion in the City's residential and commercial property tax base.

For the base case forecast, it is assumed that the City's revenues will increase at a rate proportionate to population growth. By this assumption, the City's 1982 estimated general fund revenues of about $1,913,000 will climb to about $3,165,000 by the year 2000, an overall increase of 65 percent (see Table 55).

Under the base case, it is also assumed that the City will maintain its customary mix and quality of municipal services and facilities and that its general fund expenditures will have to be maintained at about the same per capita level as prevailed at the outset of the forecast period. Thus, general fund operating expenditures are estimated to grow by 65 percent from about $1,618,000 in 1982 to $2,677,000 by 2000 (see Table 56). Operating expenditures are projected to consume about 85 percent of general fund receipts, with the remainder available for capital improvements and debt service.

At present, the City's overall financial situation seems improved over recent years. The City's per capita valuation is now typical of middle-sized Alaska cities, thanks to recent town development. However, it should be noted that Soldotna's role as a residential community and governmental and commercial center for the Central Peninsula area may help perpetuate an imbalance and relatively disadvantageous property tax base structure for Soldotna. The City must rely heavily on residential and commercial development for revenues, since it does not have tax access to the highly valued industrial plants in the North Kenai-Nikiski industrial complex which employs so many of the area's residents.

The City of Soldotna now experiences a relatively high indebtedness ratio when the City's own debt is combined with the City's share of borough indebtedness. This situation, in conjunction with the above-noted imbalance in its property tax base, may place financial strain upon the City's debt capacity, if major capital improvements are needed during the forecast period.

CAUSE/EFFECT OF IMPACTS

Soldotna is estimated to grow at an annual average rate of about 3 percent under the base case forecast. This growth rate is slower than in the previous decade and much slower than the decade before that. Soldotna's growth is linked to its role as a residential community and commercial and service center for the Central Peninsula area upon whose overall economic vitality its own prosperity depends. It is not anticipated that any major new industrial employers will locate within Soldotna, although the City is expected to capture a part of the region's resident offshore work force for Sale CI.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

As Soldotna's population is estimated to increase by about 65 percent over the forecast period, the City should experience a trend toward a more urbanized community. The major growth impact issues at Soldotna will likely be related to relatively routine matters such as the town's perennial water supply problem, the already scheduled waste treatment plant improvements, development of a new sanitary landfill site and construction of additional fire stations to service new development. In comparison to Soldotna's recent history, the forecast imposes only moderate physical growth management demands upon the city.

SUMMARY OF IMPACTS

The base case forecast for Soldotna is for gradual growth, about 3 percent annually, along with the ordinary demands for additional public services and facilities implied by such growth. The forecast does not anticipate any transforming events such as the oil and gas boom which radically affected the communities of the Central Peninsula area in the 1960's.

TABLE 47

FORECAST OF NET CHANGE IN HOUSING DEMAND
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

Year	Net Population Change	..Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	158	48	27	'8	13
1983		5	3	1	1
1984	1;;	55	31	9	15
1985	102	31	17	5	9
1986	246	75	42	12	21
1987	110	33	19	5	9
1988	229	69	39	11	19
1989	-11	-3	-2	0	-1
1990	178	54	30	9	15
1991	60	18	10	3	5
1992	96	29	16	5	8
1993	91	28	16	4	8
1994	96	29	16	5	8
1995	95	29	16	5	8
1996	100	30	17	5	8
1997	71	22	12	4	6
1998	81	25	14	4	7
1999	-12	-4	-2	-1	-1
2000	114	35	20	5	10
TOTALS	2,004	608	341	99	168

Source: Alaska Consultants, Inc.

TABLE 48

ESTIMATED DEMAND FOR RESIDENTIAL LAND
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
982-85				
Single Family	78	14.0	5.5	19.5
Multifamily & Trailer	61	5.5	2.1	7.6
986-90				
Single Family	12,8	23.0	9.0	32.0
Multifamily & Trailer	100	9.0	3.5	12.5
1991-95				
Single Family	74	13.3	5.2	18.5
Multifamily & Trailer	59	5.3	2.1	7.4
1996-2000				
Single Family	61	11.0	4.3	15.3
Multifamily & Trailer	47	4.2	1.6	5.8
TOTAL	608	85.3	33.3	118.6

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 49

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
BASE CASE
CITY OF SOLDOTNA
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commerical and Other Capacity	Total Capacity
1982	353	183	536
1983	355	185	540
1984	378	196	574
1985	390	203	593
1986	421	219	640
1987	435	226	661
1988	464	241	705
1989	462	240	702
1990	484	252	736
1991	492	256	748
1992	504	262	766
1993	515	268	783
1994	527	274	801
1995	539	280	819
1996	552	287	839
1997	560	291	851
1998	571	297	868
1999	569	296	865
2000	583	303	886

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 50

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	536	67.2
1983	540	67.5
1984	574	71.8
1985	593	74.1
1986	640	80.0
1987	661	82.6
1988	705	88.1
1989	702	87.8
1990	736	92.0
1991	748	93.5
1992	766	95.8
1993	783	97.9
1994	801	100.1
1995	819	102.4
1996	839	104.9
1997	851	106.4
1998	868	108.5
1999	865	108.1
20G0	886	110.8

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 51

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
BASE CASE
SOLDOTNA AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,579
1983	10,646
1984	11,329
1985	11,711
1986	12,634
1987	13,046
1988	13,905
1989	13,864
1990	14,531
1991	14,756
1992	15,116
1993	15,458
1994	15,818
1995	16,174
1996	16,549
1997	16,815
1998	17,119
1999	17,074
2000	17,501

Source: Alaska Consultants, Inc.

TABLE 52

ESTIMATED DISPOSABLE SOLID WASTES
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,754	16,689
1983	2,827	17,132
1984	3,069	18,598
1985	3,236	19,610
1986	3,526	21,368
1987	3,677	22,283
1988	3,958	23,985
1989	3,986	24,155
1990	4,220	25,573
1991	4,285	25,967
1992	4,390	26,603
1993	4,489	27,203
1994	4,593	27,834
1995	4,697	28,464
1996	4,806	29,124
1997	4,883	29,591
1998	4,971	30,124
1999	4,958	30,045
2000	5,082	30,797

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 53

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	855	1,103	70
1983	860	1,118	15
1984	915	1,199	81
1985	946	1,249	
1986	1,021	1,358	1;;
1987	1,054	1,412	54
1988	1,123	1,516	104
1989	1,120	1,523	7
1990	1,174	1,608	85
1991	1,192	1,645	37
1992	1,221	1,697	52
1993	1,249	1,749	52
1994	1,278	1,789	40
1995	1,307	1,830	41
1996	1,337	1,872	42
1997	1,359	1,903	31
1998	1,384	1,938	35
1999	1,380	1,932	(6)
2000	1,415	1,981	49

Source: Alaska Consultants, Inc.

TABLE 54

SCHOOL ENROLLMENT FORECAST
BASE CASE
CITY OF SOLDOTNA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	338	226	564
1983	341	227	568
1984	362	242	604
1985	375	250	625
1986	404	270	674
1987	418	278	696
1988	445	297	742
1989	443	296	739
1990	465	310	775
1991	472	315	787
1992	484	322	806
1993	494	330	824
1994	506	338	844
1995	518	345	863
1996	530	353	883
1997	538	359	897
1998	548	365	913
1999	547	364	911
2000	560	373	933

Source: Alaska Consultants, Inc.

TABLE 55

GENERAL FUND
REVENUE FORECAST
BASE CASE
CITY OF SOLDOTNA
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 548	$ 582	$ 316	$ 467	$1,913
1983	551	586	318	470	1,925
1984	587	623	339	500	2,049
1985	606	644	350	517	2,117
1986	654	695	378	558	2,285.
1987	676	718	390	576	2,360
1988	720	765	416	614	2,515
1989	718	763	414	612	2,507
1990	752	799	434	641	2,626
1991	764	812	441	651	2,668
1992	783	831	452	667	2,733
1993	800	850	462	682	2,794
1994	819	870	473	698	2,860
1995	837	890	484	714	2,925
1996	857	910	495	730	2,992
1997	871	925	503	742	3,041
1998	886	942	512	756	3,096
1999	884	939	510	754	3,087
2000	906	963	523	773	3,165

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 56

FORECAST OF REVENUES AND OPERATING EXPENDITURES
BASE CASE
CITY OF SOLDOTNA
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,913	$1,618	$ 295
1983	1,925	1,628	297
1984	2,049	1,733	316
1985	2,117	1,791	326
1986	2,285	1,932	353
1987	2,360	1,995	365
1988	2,515	2,127	388
1989	2,507	2,120	387
1990	2,626	2,222	404
1991	2,668	2,257	411
1992	2,733	2,312	421
1993	2,794	2,364	430
1994	2,860	2,419	441
1995	2,925	2,474	451
1996	2,992	2,531	461
1997	3,041	2,572	469
1998	3,096	2,618	478
1999	3,087	2,611	476
2000	3,165	2,677	488

a/ The City of Soldotna does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Homer

COMMUNITY FORECASTS - BASE CASE

Future Population

The City of Homer is currently the smallest of the three Kenai Peninsula communities under study. It is also forecast to be the fastest growing during the next two decades. Strong advances in the fishing and seafood processing industries and the local service sector are expected to promote Homer's growth. Also, Homer is expected to be the most affected of the three communities by the scenario for Sale CI, mainly as a result of its nearness and attractiveness as a place of residence for offshore OCS workers.

Homer is forecast to grow from about 2,148 residents in 1980 to 5,429 by 2000 (see Table 32). This is an overall increase of 153 percent or an average rate of better than 4.5 percent a year. Growth is swiftest during the latter part of the 1980's, corresponding with the onset of Sale CI production. At a peak, Sale CI supports almost 13 percent of the City's population, mainly through its role as home base for offshore field workers rather than as itself a site for much Sale CI activity. Homer is also prone to be proportionately more impacted by Sale CI than Kenai or Soldotna due to its smaller size and because previous to Sale CI it has had little oil and gas related employment.

IMPACT ASSESSMENT

Social Impact

Of the three Kenai communities, Homer appears most vulnerable to social change under the base case scenario. Homer is forecast to experience the most rapid economic and population growth. Furthermore, a substantial portion of its expansion accrues from its function as a residential community serving the Sale CI offshore work force. This rapid growth trend may tend to erode the semi-rural atmosphere which has been the source of Homer's appeal to many of its residents. The Sale CI scenario poses few direct burdens upon Homer, so there is little likelihood of direct physical conflict at Homer between fishing operations and offshore marine support activities. Nevertheless, there is potential for conflict between the fishing and oil industries based on fishermen's fears that offshore operations may adversely affect fishery resources or operations. If so, then the perceived incompatibility of the fishing and oil and gas industries may become a continuing divisive issue in the community.

Impacts on Community Infrastructure

Housing and Residential Land. The housing forecast for Homer under the base case scenario estimates that a net increase of 951 units will be demanded by 2000 to house new residents (see Table 57). The strongest demand will occur during the first half of the forecast period when Homer experiences the combined economic stimulation of an expanding deep sea fishery and OCS lease Sale CI. If the future-housing demand resembles the current pattern of housing types, then about 60 percent (572 units) of the housing units will be conventional single family dwellings, about 32 percent (303 units) will be trailers, and only 8 percent (76 units) will be in multifamily dwellings.

For future residential development, natural hazards, poor soil conditions and drainage patterns, competition for other uses and public ownership of large parcels of land virtually rule out Homer Spit as a potential site. Similar physical factors affect the pattern of development on the Homer mainland. Still, there appears to be an ample supply of undeveloped land for future residential and commercial expansion. There are many vacant lots on the main streets in town and many undeveloped tracts near the commercial center of town which currently have no road access. It is estimated that about 77 hectares (190 acres) of undeveloped land will be demanded to accommodate housing construction to meet needs generated by the base case scenario (see Table 58) and that sufficient land for the purpose can be made available through installation of needed public access and utilities.

Utilities

- Water. Homer derives its water from the Bridge Creek Reservoir which has a storage capacity of 548,825 kiloliters (145 million gallons). A reservoir at the water treatment plant and a second reservoir provide approximately 2,839 kiloliters (750,000 gallons) of storage. Water service is provided within the City limits, including the Homer Spit.

During periods of peak demand, industrial consumption currently accounts for as much as 90 percent of Homer's total water demand and, on an annual basis, for about 56 percent of the total. For the base case forecast, industrial demand is assumed to account for an even higher annual average of about 65 percent. This increase is related to the water consumption requirements of the fish processing industry and the marine service base serving offshore rigs during Sale CI exploration, development and production. Both of these industries are intensive water users and will be supplied by the City system.

Over the base case forecast period, water demand in Homer is forecast to increase about 114 percent, from 3,471 kiloliters (917,000 gallons) in 1982 to just under 7,570 kiloliters (2 million gallons) in the year 2000 (see Table 59). Water supply from present sources is adequate to accommodate this increase. However, treatment capacity is restricted. As designed, the treatment facility is meant to serve a population of 2,350 only if industrial demand remains relatively constant. As the base case population is forecast to reach this level by 1981 and a steep rise in industrial demand is forecast, it appears that existing treatment capacity will soon be outrun, and that capacity may need to be expanded two to threefold over the forecast period.

Sewer. The City of Homer sewer system serves the central commercial district and residential areas to the north and east of town. Not served by the system are outlying subdivisions within the City limits and the Homer Spit where sewage is treated by individual septic tanks with soil absorption systems. Wastewaters from the seafood processing plants are treated and discharged separately through outfalls into Kachemak Bay.

The 1977 Comprehensive Sewer Plan adopted by the City determined that if housing density remained constant, Homer's sewer system was adequate to serve a population of about 2,700. The City's sewage treatment plant can process 1,048 kiloliters (277,000 gallons) per day.

Under the base case, treatment plant capacity requirements are estimated to climb to 1,166 kiloliters (308,000 gallons) per day by 1982 and to 2,570 kiloliters (679,000 gallons) per day by 2000 (see Table 60). If these forecasts hold true, then the present capacity of the treatment plant will be exceeded in a couple of years and major expansion will be in order to meet long-term needs. The sewage collection system will also require significant improvements and expansion to serve new residential development and may need to be extended to the Spit to serve the development expected to be located there.

- Electric Power. The Homer E" ectric Association (HEA), an REA cooperative serves the Homer area with power purchased from Chugach Electric Association s natural gas-powered generating plant at Beluga across Cook Inlet. The proposed Corps of Engineers hydro-electric project at Bradley Lake north of Homer could provide an additional source of power to the area in 1987. It appears that as long as local natural gas supplies are adequate to fuel the Beluga plant, HEA will be able to purchase sufficient power to meet base case requirements in Homer through the forecast period (see Table 61).

- Solid Waste Disposal. Commercial and residential garbage in the Homer area is collected by a private contractor and hauled to a new 4 hectare (10 acre) landfill on the Sterling Highway north of the City operated by the Kenai Peninsula Borough. The Borough estimates the landfill to have a useful life of about five years, although optimum maintenance could extend this somewhat longer.

  Borough public works personnel have determined that about 0.4 hectare (one acre) is required to dispose of 8,028 cubic meters (10,500 cubic yards) of solid waste. In the base case scenario, the estimated 395,737 cubic meters (517,574 cubic yards) of disposable solid waste to be generated by the City of Homer will consume roughly 20 hectares (50 acres) of landfill by the year 2000 (see Table 62). Disposable solid waste generated by people residing outside the City but within the Homer area will consume an additional 20 hectares (50 acres) of landfill.

- Communications. During the base case, the number of telephone hook-ups in Homer is estimated to increase about 140 percent, from 957 hook-ups in 1982 to 2,303 hook-ups in the year 2000 (see Table 63). Although expanding the system to accommodate growth is reportedly a routine matter, Glacier Telephone Company, which provides service to the Homer area, is currently way behind demand in adding new stations and installing new telephones in Homer. Similar service delays may occur in the future during periods of rapid population growth.

Public Safety

- Police. The Homer Department of Public Safety provides police protection within the City of Homer, while areas outside the City are served by the Alaska State Troopers. The Department of Public Safety is currently staffed by six police officers, including a chief. Beyond existing facilities and staff, the Homer police department may need to acquire an additional six new officers along with support facilities and an additional 10 to 11 jail cells in order to maintain standards of service in pace with population growth.

- Fire Protection. The Homer volunteer fire department provides fire protection services throughout the City and, when possible, to road connected areas outside the City limits. Fire protection at the State airport is provided by the City under contract to the State. The fire department also provides emergency medical services in the City. The Coast Guard vessel has its own firefighting capability although Coast Guard firefighting personnel and equipment have been used by the City in emergencies.

  Even without the growth forecast in the base case, Homer's fire protection service has a number of deficiencies which need attention. These include the lack of a full-time staff, inadequate pumping and water storage capacity, poorly distributed fire hydrants and outmoded equipment.

  Homer's major fire protection problem area is Homer Spit where the crowded small boat harbor and heavy concentration of valuable commercial and industrial property increase the potential for serious fire. The long equipment run from the central fire station and the single 25.4 centimeter (lO-inch) water main serving the Spit adversely affect the ability of the Department to respond adequately to fires in this locale. Expansion of the small boat harbor, the planned acquisition of a new 63 liter per second (1,000 gallon per minute) pumper to be stationed on the Spit and the construction of water storage capacity here will do much to alleviate the problem. Regardless, with the increased concentration of high value property on the Spit envisioned in the base case, the City may need to construct a substation on the Spit. Also, with increasingly heavy residential development in the East Hill area, the need for additional water storage capacity to meet fire flow requirements will become more apparent.

Health and Social Services. For a community of its size, Homer has available a good mix of medical facilities and professional services. Health facilities include the Borough-owned South Peninsula Hospital which serves Homer and its environs to just north of Ninilchik.

Based on the standard of three acute beds for each 1,000 population, the 17-bed South Peninsula Hospital today has an excess capacity of several beds, but by the end of the base case forecast will probably need to double its capacity. Recent occupancy rates of less than 40 percent, however, suggest that the standard of three beds per 1,000 population may be too high for communities such as Homer which have reasonably good access to a wide variety of superior medical facilities and services in Anchorage. If the rate of use of local hospital facilities remains well below the standard throughout the forecast period, Homer is likely to require few, if any, additional hospital beds.

While hospital occupancy rates have declined in recent. years, use of outpatient and emergency room facilities has undergone a dramatic increase. This has placed a tremendous strain on both space and equipment used for these purposes. If Homer area residents continue to rely heavily on the Hospital's outpatient clinic and emergency room for the provision of medical services, these facilities will probably have to be significantly expanded to meet area population growth during the base case forecast.

In 1979, there were six doctors practicing in the Homer area. In addition, about 35 specialists visit Homer periodically and provide on-call assistance. Applying the standard of two physicians for a community of 3,000 plus another physician for each additional increment of 1,500 population, one or two additional physicians will be demanded in the Homer area by the year 2000 There are presently two dentists available to area residents. During the base case forecast, at least one additional dentist will be demanded.

Education. Because the Kenai Peninsula Borough provided educational services on an areawide basis for the entire Borough, the City of Homer is not required to finance and administer a local school district. The Borough school system is funded primarily through State contributions, but the Borough contributes some funds raised on an areawide basis. The Borough operates an elementary school and a junior/senior high school in Homer. The elementary school houses students in grades K through 5 from Homer and the road-connected area up to, but not including, Anchor Point. The junior/senior high school serves students in grades 6 through 8 as far north as, but not including, Anchor Point, while the service area for grades 9 through 12 includes the communities of Anchor Point and Nikolaevsk, although few students from the latter village go beyond grade 8.

Although it is anticipated that Homer schools will continue to accommodate students from outside the community during the base case forecast, enrollment estimates and capacity requirements used in this forecast are for Homer students only. However, assuming the school system service area is equivalent to the Homer area, it can be assumed that classroom demands for the area will be roughly double those of the City as the population of the area is about double that of the City. Base case enrollment figures also assume the traditional organization of grades K to 6 in elementary school and grades 7 through 12 in high school rather than the organization which now exists in Homer of grades K to 5 in elementary school and grades 6 to 12 in high school.

Homer school enrollments for the base case are projected to grow steadily throughout the forecast period (see Table 64). Net growth in enrollment is about 120 percent, to 652 elementary students and 434 high school students in the year 2000.

A review of the present capacity and condition of Homer's school facilities indicates that the community is not equipped with facilities to handle such long-term enrollment expansion. The 652 elementary school students projected for the year 2000 should need from 26 to 27 classrooms, nearly double the number of existing elementary classrooms. The Borough is currently considering two expansion proposals, a six-classroom addition to East Homer Elementary School and a new 10-room facility. However, neither would suffice to accommodate projected enrollments through the year 2000. Assuming the construction a new 10-room elementary school, an additional four to five classrooms would be demanded sometime before 1995.

The recent addition of nine classrooms to the Homer Junior/Senior High School brings that facility's total classroom capacity to 19, about three fewer than demanded at the end of the base case forecast. However, the Borough does intend to construct an addition to the existing facility to house a theater, cafeteria, domestic science classrooms and offices. It is conceivable that some of this space could be modified into general classrooms. Otherwise, several high school classrooms will probably have to be added near the end of the forecast.

Recreation. With the possible exception of a new community center, Homer's indoor recreation facilities are adequate for the base case forecast. Public outdoor facilities, particularly neighborhood parks and recreation areas, appear to be deficient and several are likely to be demanded throughout the City. Homer's small boat harbor is an important recreational asset for local residents as well as an economic asset for its tourism and recreational industry. The boat harbor is severely overcrowded now and needs expansion to satisfy current and future demand.

Local Government Finances. As of fiscal year 1978, the most recent year for which data is available, local property taxes were the main source of general fund revenues for the City of Homer, providing about 55 percent of the City's general fund income. Various other local revenues account for another 9 percent of general funds while intergovernmental transfers account for the remaining 36 percent, better than one-third of all general funds.

As a general rule, it is expected that the City's revenues will increase in proportion to its population growth. By this standard, it is estimated that the City's general fund income of approximately $910,000 as of fiscal year 1978 will reach about $2,400,000 by the close of the forecast period, or an increase of about 164 percent (see Table 65).

In the base case forecast, it is also assumed that the City will maintain essentially the variety and level of public services at about the same relative level of per capita cost as it does at present. Thus, operating expenditures are projected to grow at about the same rate as general fund income. If this relationship between growth in revenues and expenditures persists, then the City should receive income in excess of operating needs to apply to capital expenditures and debt service (see Table 66). Also, if the City maintains its 3 percent sales tax, which is at present earmarked for debt service, those additional revenues may also be applied to capital improvement needs.

The City of Homer's present financial status appears to be representative of medium-sized Alaska municipalities in regard to its per capita assessed valuation and better than average in its ratio of bonded debt to valuation. This last factor is important, since it appears that the City may be called upon to sponsor public improvements for water supply and waste treatment in the near future to serve a rapidly growing population.

CAUSE/EFFECT OF IMPACTS

The economic base analysis indicates that the City of Homer's growth will be stimulated by a continuing dynamic economy during the forecast. Strong growth in a number of different sectors is expected to contribute. Development of a groundfish industry in Lower Cook Inlet waters will likely be based at Homer's port, which will also benefit from improved economic conditions in the traditional fisheries. Homer is also advantageously located to serve as the home community for a substantial share of the permanent offshore work force operating the fields developed in Sale CI lease areas. Finally, Homer's continuing appeal as a tourism and recreation center can support further expansion in the trade and services sectors of its economy.

The net result of these factors is that Homer, the smallest in population of the three study cities, is projected to grow at the fastest rate, about 4.5 percent annually, for a cumulative increase of 153 percent over the forecast period. For a community of Homer's size, this is a high rate of sustained growth.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

Homer's projected rapid growth, especially in comparison to its present size, can be expected to place some heavy demands upon the City for maintenance of community infrastructure and services. Particular issues of potential concern are residential land development, including the extension of utility services; additional water treatment capacity (the basic water supply appears adequate for the base forecast); major expansion of the sanitary waste treatment facility; development of a new sanitary landfill site; and expanded police and fire protection services, including additional jail facilities and fire stations. Also, growth in the fishing fleet and local fish processing industry is likely to necessitate further port development.

SUMMARY OF IMPACTS

Homer is projected to attain a relatively high rate of growth, amounting to a cumulative increase of 153 percent over the forecast period largely accruing from' expansion in its fisheries and OCS employment base. As a result, Homer may be called upon to make significant improvements to a wide range of its public facilities and services.

TABLE 57

FORECAST OF NET CHANGE IN HOUSING DEMAND
BASE CASE
CITY OF HOMER
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	160	48	29	4	15
1983	160	48	29	4	15
1984	183	55	33	4	18
1985	262	79	48	6	25
1986	372	113	68	9	36
1987	280		51	7	27
1988	329	1:;	60	8	32
1989		16	10	1	5
1990	1;:	58	35	5	18
1991	61	18	11	1	6
1992	152	46	27	4	15
1993	138	42	25	3	14
1994	142	43	26	3	14
* 1995	147	45	27	4	14
1996	155	47	28	4	15
1997	112	34	20	3	11
1998	119	36	22	3	11
1999	-54	-16	-10	-1	-5
2000	117	54	33	4	17
TOTALS	3,139	951	572	76	303

a/ Numbers in parentheses represent the cumulative housing surplus resulting from net population loss.

Source: Alaska Consultants, Inc.

TABLE 58

ESTIMATED DEMAND FOR RESIDENTIAL LAND
BASE CASE
CITY OF HOMER
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	139	25.0	9.7	34.7
Multifamily & Trailer	91	8.2	3.2	-11.4
1986-90				
Single Family	224	40.3	15.7	56.0
Multifamily & Trailer	148	13.3	5.2	18.5
1991-95				
Single Family	116	20.9	8.1	29.0
Multifamily & Trailer	78	7.0	2.7	9.7
1996-2000				
Single Family	93	16.7	6.5	23.2
Multifamily & Trailer	62	5.6	2.2	7.8
TOTAL	951	137.0	53.3	190.3

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 59

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
BASE CASE
CITY OF HOMER
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	306	611	917
1983	326	648	974
1984	349	670	1,019
1985	382	756	1,138
1986	428	875	1,303
1987	463	947	1,410
1988	504	1,028	1,532
1989	511	996	1,507
1990	535	1,017	1,552
1991	543	1,031	1,574
1992	562	1,067	1,629
1993	579	1,100	1,679
1994	597	1,134	1,731
1995	615	1,169	1,784
1996	634	1,205	1,839
1997	648	1,232	1,880
1998	663	1,259	1,922
1999	656	1,245	1,901
2000	679	1,287	1,966

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 60

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
BASE CASE
CITY OF HOMER
1982 - 2000

Year	Daily Treatment Capacity 1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	308	38.5
1983	328	41.0
1984	351	43.9
1985	384	48.0
1986	432	54.0
1987	467	58.4
1988	506	63.2
1989	513	64.1
1990	537	67.1
1991	545	68.1
1992	564	70.5
1993	581	72.6
1994	599	74.9
1995	617	77.1
1996	636	79.5
1997	650	81.2
1998	664	83.0
1999	656	82.0
2000	679	84.9

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 61

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
BASE CASE
HOMER AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	9,868
1983	10,468
1984	11,133
1985	12,370
1986	13,783
1987	14,590
1988	15,180
1989	15,383
1990	16,095
1991	16,324
1992	16,894
1993	17,411
1994	17,944
1995	18,495
1996	19,076
1997	19,487
1998	19,928
1999	19,695
2000	20,359

Source: Alaska Consultants, Inc.

TABLE 62

ESTIMATED DISPOSABLE SOLID WASTES
BASE CASE"
CITY OF HOMER
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,435	14,562
1983	2,641	15,810
1984	2,860	17,276
1985	3,303	19,866
1986	3,761	22,514
1987	4,000	23,912
1988	4,309	26,113
1989	4,410	26,725
1990	4,615	27,967
1991	4,681	28,367
1992	4,844	29,355
1993	4,993	30,258
1994	5,146	31,185
1995	5,305	32,148
1996	5,472	33,160
1997	5,593	33,894
1998	5,721	34,669
1999	5,663	34,318
2000	5,854	35,475

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 63

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
BASE CASE
CITY OF HOMER
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	742	957	69
1983	790	1,027	70
1984	845	1,107	80
1985	942	1,220	113
1986	1,037	1,379	159
1987	1,122	1,503	124
1988	1,222	1,650	147
1989	1,238	1,684	34
1990	1,296	1,776	92
1991	1,314	1,813	37
1992	1,360	1,890	77
1993	1,402	1,963	73
1994	1,445	2,023	60
1995	1,490	2,086	63
1996	1,537	2,152	66
1997	1,571	2,199	47
1998	1,607	2,250	51
1999	1,591	2,227	(23)
2000	1,645	2,303	76

Source: Alaska Consultants, Inc.

TABLE 64

SCHOOL ENROLLMENT FORECAST
BASE CASE
CITY OF HOMER
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	294	196	490
1983	313	209	522
1984	335	224	559
1985	367	244	611
1986	411	274	685
1987	445	296	741
1988	484	323	807
1989	491	327	818
1990	514	342	856
1991	521	347	868
1992	539	360	899
1993	556	370	926
1994	573	832	955
1995	590	394	984
1996	609	406	1,015
1997	622	415	1,037
1998	637	424	1,061
1999	630	420	1,050
2000	652	434	1,086

Source: Alaska Consultants, Inc.

TABLE 65

GENERAL FUND
REVENUE FORECAST
BASE CASE
CITY OF HOMER
1982 - 2000
($1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 597	$ N/A	$ 393	$ 94	$1,084
1983	636	N/A	418	100	1,154
1984	681	N/A	447	07	1,235
1985	745	N/A	489	17	1,351
1986	835	N/A	549	32	1,516
1987	904	N/A	594	42	1,640
1988	984	N/A	647	55	1,786
1989	997	N/A	655	57	1,809
1990	1,043	N/A	686	64	1,893
1991	1,058	N/A	695	67	1,920
1992	1,095	N/A	720	173	1,988
1993	1,129	N/A	742	178	2,049
1994	1,164	N/A	765	183	2,112
1995	1,199	N/A	788	189	2,176
1996	1,237	N/A	813	195	2,245
1997	1,265	N/A	831	199	2,295
1998	1,294	N/A	850	204	2,348
1999	1,280	N/A	841	202	2,323
2000	1,324	N/A	870	209	2,403

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 66

FORECAST OF REVENUES AND OPERATING EXPENDITURES
BASE CASE
CITY OF HOMER
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,084	$ 974	$ 110
1983	1,154	1,038	116
1984	1,235	1,111	124
1985	1,351	1,215	136
1986	1,516	1,363	153
1987	1,640	1,474	166
1988	1,786	1,605	181
1989	1,809	1,627	182
1990	1,893	1,702	191
1991	1,920	1,727	193
1992	1,988	1,787	201
1993	2,049	1,842	207
1994	2,112	1,898	214
1995	2,176	1,957	219
1996	2,245	2,019	226
1997	2,295	2,063	232
1998	2,348	2,110	238
1999	2,323	2,089	234
2000	2,403	2,159	244

a/ The City of Homer does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

PROJECTIONS OF GROWTH - EXPLORATION ONLY SCENARIO

Introduction

The exploration only and other two OCS petroleum scenarios or cases which form the basis of the socioeconomic impact assessment for Kenai, Soldotna and Homer in this study were selected by the U.S. Bureau of Land Management's Alaska OCS Office and developed by Dames and Moore from U.S. Geological Survey resource estimates. Although reasonably precise locations, quantities, methods of operation and time frames are necessary to the development of plausible scenarios, such scenarios and their impacts should not be interpreted as forecasts of what is actually going to happen. There is far too much uncertainty in oil and gas exploration and development for this degree of precision. However, an indication is given of the type and scale of activities which could impact Lower Cook Inlet communities and the extent to which individual communities would logically be impacted.

The exploration only scenario assumes that the proposed Lower Cook Inlet and Shelikof Strait OCS Lease Sale #60 will take place as scheduled in September 1981. Exploration begins in the year following the lease sale, activity peaks in the second year and terminates in the third year after the lease sale with no commercial finds. A total of 19 exploratory wells are drilled, 11 in Shelikof Strait and 8 in Lower Cook Inlet. Exploration support for this scenario is provided from existing facilities at Nikiski and, to a lesser extent, from Homer. Following the conclusion of exploration at the end of 1984, there is no further OCS activity in the region as a consequence of this lease sale.

During the three years of active exploration, effects on the economy and population of Kenai, Soldotna and Homer are minimal and are mainly related to support services supplied from the Nikiski-North Kenai area and logistic air support based at Homer (see Table 67). Offshore crews are employed on a rotation schedule and most are assumed to live outside the Kenai-Cook Inlet Census Division. Consequenttly, most employees travel between work stations and permanent residences with only passing visits to Kenai Peninsula communities. Overall, the exploration only scenario stimulates no new industrial or port development and imposes no lasting burden on the infrastructure of any of the three communities under study.

At the peak of exploration, the direct and indirect economic stimulus of Sale #60 supports at most about 187 jobs and about 467 residents in the entire Kenai-Cook Inlet Census Division, spread among the cities of Kenai, Soldotna and Homer and surrounding rural areas (see Tables 68 and 69). Following early shutdown of the exploration phase, community conditions revert to the patterns forecast under the base case.

TABLE 67

ASSUMPTIONS FOR THE DISTRIBUTION OF EMPLOYMENT
AMONG THE COASTAL AREAS OF KENAI, HOMER AND AFOGNAK ISLAND
EXPLORATION ONLY SCENARIO
LOWER COOK INLET

Phase, Task and Area of Operations	Kenai	Homer	Afognak Island
EXPLORATION			
Survey			
Offshore Geophysical and Geological Surveying [area of operation]	Not Applicable	Survey vessels conducting geophysical and geological surveys in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Survey vessels conducting geophysical and geological surveys in Shelikof Strait outside the Kenai-Cook Inlet coastal area.
Onshore Service Base	Not Applicable	Temporary (advance) service base providing resupply and communications for vessels surveying in Lower Cook Inlet and Shelikof Strait.	Not Applicable ,
Rigs			
Offshore Exploration Well Drilling [area of operation]	Not Applicable	Rigs drilling exploration wells in Lower Cook Inlet Inlet outside the Kenai-Cook Inlet coastal area.	Rigs drilling exploration wells in Shelikof Strait outside the Kenai-Cook Inlet coastal area.

Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Supply/achor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Onshore Service Base	Shore base supplying rigs and boats in Lower Cook Inlet and Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo.	Shore base supplying rigs and boats in Lower Cook Inlet and Shelikof Strait with fuel, water, mud, cement, food and other cargo.	Not Applicable
Air Transportation	Not Applicable	Helicopter service from Homer Airport transporting offshore personnel and small volume, light weight freight to and from rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable

Source: Alaska Consultants, Inc. Derived from facility and OCS employment scenarios prepared by Dames and Moore.

TABLE 68

FORECAST OF TOTAL EMPLOYMENT FROM EXPLORATION ONLY SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area	Southern Peninsula Area	Total
1982	68	72	140
1983	88	99	187
1984	20	19	39
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 69

FORECAST OF TOTAL POPULATION FROM EXPLORATION ONLY SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area			Southern Peninsula Area		Total
	City of Kenai	City of Soldotna	Remaining Area	City of Homer	Remaining Area	
1982	42	40	84	91	89	350
1983	59	51	110	124	123	467
1984	14	12	24	24	24	98
1985						
1986						
1987						
1988						
1989						
1990	1985 - 2000 is same as Base Case.					
1991						
1992						
1993						
1994						
1995						
1996						
1997						
1998						
1999						
2000						

Source: Alaska Consultants, Inc.

TABLE 70

FORECAST OF POPULATION
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	27,270	215	135	27,620
1983	26,851	282?	185	27,320
1984	27,368	60	38	27,466
1985				
1986				
1987				
1988				
1989		1985-2000 is same as Base Case		
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Source: Alaska Consultants, Inc.

TABLE 71

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - KENAI AREA
1982 - 2000

Year	Survey	Rigs	Platforms		Supply/Anchor/Tug Boats			Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
			Development Drilling	Operations	Exploration	Development	Production			
1982					52					52
1983					69					69
1984					15					15
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992										
1993										
1994										
1995										
1996										
1997										
1998										
1999										
2000										

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 72

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - CENTRAL PENINSULA AREA (KENAI)
1982- 2000

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1982	29	15	44	110
1983	37	19	56	140
1984	8	4	12	30
1985				
1986				
1987				
1988				
1989				
1990	1985 - 2000 is same as Base Case.			
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Source: Alaska Consultants, Inc.

TABLE 73

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
EXPLORATION ONLY SCENARIO
LOWER COOK INLET KENAI AREA
1982- 2000

Year	Service Base	Helicopter Service: Exploration	Helicopter Service: Development	Helicopter Service: Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1982	16											16
1983	21											21
1984	5											5
1985												
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994												
1995												
1996												
1997												
1998												
1999												
2000												

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 74

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - CENTRAL PENINSULA AREA (KENAI)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	16	8	24		24	60	60
1983	21	11	32		32	80	80
1984	5	3	8		8	20	20
1985							
1986							
1987							
1988							
1989							
1990							
1991							
1992							
1993							
1994							
1995							
1996							
1997							
1998							
1999							
2000							

Source: Alaska Consultants, Inc.

TABLE 75

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - HOMER AREA
1982 - 2000

Year	Survey	Rigs	Platforms		Supply/Anchor/Tug Boats			Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
			Development Drilling	Operations	Exploration	Development	Production			
1982	15	56			26					97
1983	21	112			35					168
1984	4	23			7					34
1985										
1986										
1987										
1988										
1989										
1990										
1991										
1992										
1993										
1994										
1995										
1996										
1997										
1998										
1999										
2000										

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 76

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1982	28	14	42	105
1983	38	19	57	142
1984	8	4	12	30
1985				
1986				
1987				
1988				
1989				
1990	1985 - 2000 is same as Base Case.			
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Source: Alaska Consultants, Inc.

TABLE 77

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - HOMER AREA
1982 - 2000

Year	Service Base	Helicopter Service Exploration	Helicopter Service Development	Helicopter Service Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1982	9	15										24
1983	13	20										33
1984	2	4										6
1985												
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994												
1995												
1996												
1997												
1998												
1999												
2000												

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 78

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
8

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	24	6	30		30	75	75
1983	33	9	42		42	105	105
1984	6	1	7		7	18	18
1985							
986							
987							
988							
989							
1990							
1991							
1992							
1993							
1994							
1995							
1996							
1997							
1998							
1999							
2000							

Source: Alaska Consultants, Inc.

Kenai

COMMUNITY FORECASTS - EXPLORATION ONLY SCENARIO

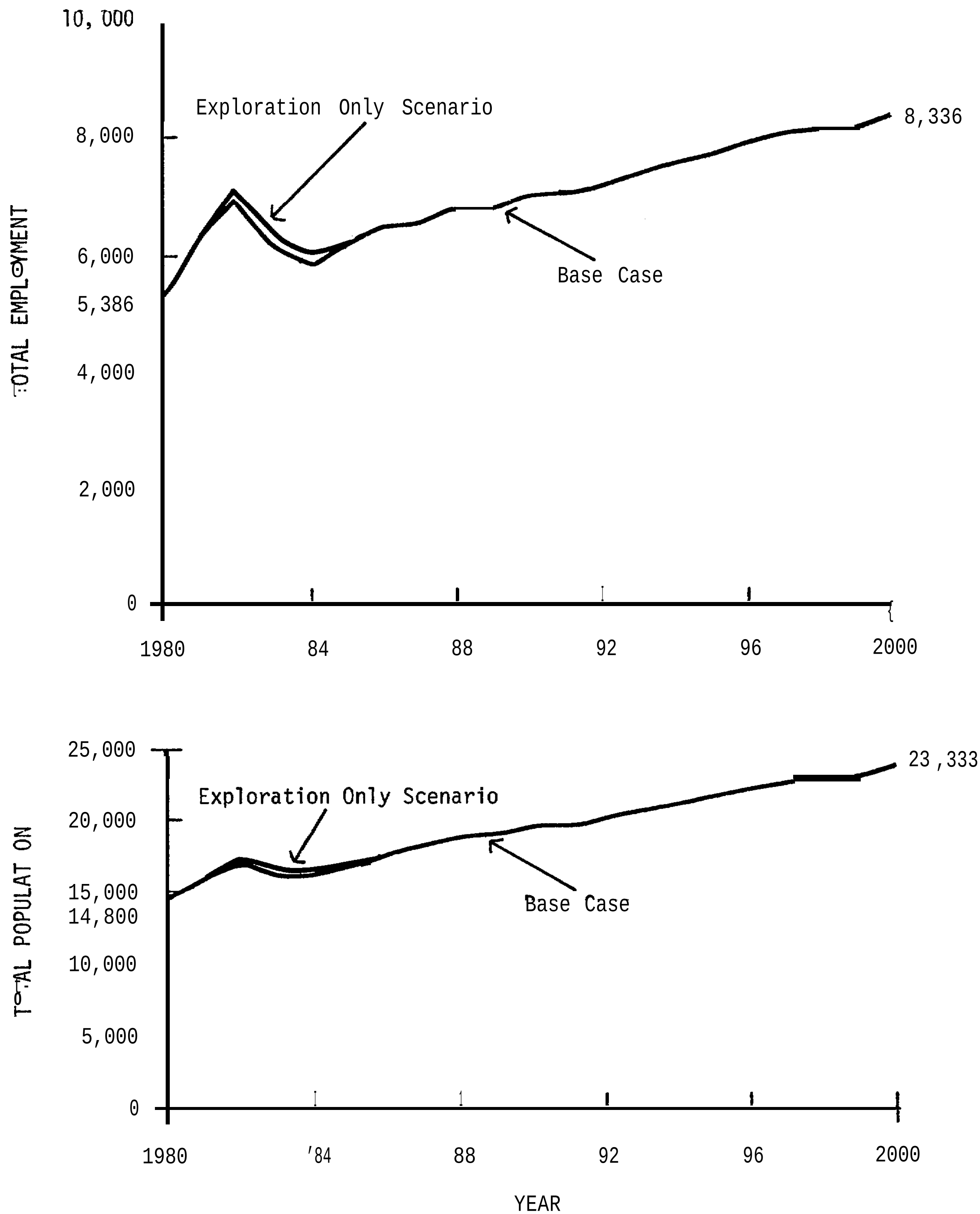
Significant Factors Affecting Growth

This scenario's growth impacts on Kenai are minor and brief (see Table 79 and Figure 4). The Nikiski-North Kenai area is already the support center for ongoing operations offshore and onshore in Upper Cook Inlet as well as the assumed support base for Sale CI in Lower Cook Inlet. The area is, therefore, well located and able to support exploration for the Lower Cook Inlet portion of Sale #60. Lower Cook Inlet operations add an estimated maximum of 58 direct and 30 indirect jobs in the second year of exploration for the entire Central Peninsula area, supporting an estimated temporary population increase of 59 persons in the City of Kenai (see Table 79). Another estimated 110 persons are drawn to the unincorporated Nikiski-North Kenai area, outside the City of Kenai proper. By 1985, exploration activities in Lower Cook Inlet and Shelikof Strait are shut down with the related employees and their dependents either departing the area or being absorbed by other areas of the local economy.

Overall, compared to growth accruing from general economic expansion, the 1977 Lower Cook Inlet lease sale, and development of the North Kens'i LNG facility, Sale #60 contributes only marginally to the demand f'or new public services and facilities in Kenai and then only for the period ' 1982-84 (see Tables 80 to 89).

FIGURE 4

Kenai - Soldotna Area
Total Employment and Total Population
Base Case and Exploration Only Scenario
Lower Cook Inlet
1980 - 2000



Source: Alaska Consultants, Inc.

TABLE 79

FORECAST OF POPULATION
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - CITY OF KENAI
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	4,982	28	18	5,028
1983	5,027	35	24	5,086
1984	5,116	8	6	5,130
1985				
1986				
1987				
1988				
1989		1985-2000 is same as Base Case.		
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Source: Alaska Consultants, Inc.

TABLE 80

FORECAST OF NET CHANGE IN HOUSING DEMAND
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	116	37	19	12	6
1983	58	18	9	6	3
1984		14	7	5	2
1985	1::	44	23	14	7
1986					
1987					
1988					
1989					
1990	1986 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
TOTAL	2,088	664	344	217	103

Source: Alaska Consultants, Inc.

TABLE 81

ESTIMATED DEMAND FOR RESIDENTIAL LAND
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights (’ w : /	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	58	10.4	4.1	14.5
Multifamily & Trailer	55	5.0	1.9	6.9
1986-90				
Single Family	78	14.0	5.5	19.5
Multifamily & Trailer	70	6.3	2.4	8.7
1991-95				
Single Family	109	19.6	7.6	27.2
Multifamily & Trailer	103	9*3	3.6	12.9
1996-2000				
Single Family	99	17.8	6.9	24.7
Multifamily & Trailer	92	8.3	3.2	11.5
TOTAL	664	90.7	35.2	125.9

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 82

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	628	226	854
1983	636	229	865
1984	641	231	872
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

*

TABLE 83

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 -2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	854	106.8
1983	865	108.1
1984	872	109.0
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 84

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
EXPLORATION ONLY SCENARIO
KENAI AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	23,474
1983	21,632
1984	30,538
1985	
1986	
1987	
1988	
1989	
1990	1985 - 2000 is same as Base Case.
1991	
1992	
1993	
1994	
1995	
1996	
1997	
1998	
1999	
2000	

Source: Alaska Consultants, Inc.

TABLE 85

ESTIMATED DISPOSABLE SOLID WASTES
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	6,612	39,492
1983	5,757	34,120
1984	5,353	32,259
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 86

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	1,596	2,059	43
1983	1,614	2,098	49
1984	1,628	2,133	35
1985	1,672	2,207	74
1986			
1987			
1988			
1989			
1990	1986 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 87

SCHOOL ENROLLMENT FORECAST
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	604	402	1,006
1983	610	407	1,017
1984	616	410	1,026
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 88

GENERAL FUND
REVENUE FORECAST
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$1,518	$ 952	$ 846	$ 278	$3,594
1983	1,535	963	856	281	3,635
1984	1,549	971	863	284	3,667
1985					
1986					
1987					
1988					
1989					
1990	1985 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 89

FORECAST OF REVENUES AND OPERATING EXPENDITURES
EXPLORATION ONLY SCENARIO
CITY OF KENAI
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$3,594	$2,492	$1,102
1983	3,635	2,521	1,114
1984	3,667	2,542	1,125
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ The City of Kenai does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Soldotna

COMMUNITY FORECASTS - EXPLORATION ONLY SCENARIO

Significant Factors Affecting Growth

Under the exploration only scenario, growth impacts on Soldotna are minimal (see Table 90). An existing base at Nikiski supports exploration for the Lower Cook Inlet portion of Sale #60. Exploration activities generate an estimated maximum of 58 in direct employment and an additional 30 indirect jobs for the entire Central Peninsula area, mostly in the Nikiski-North Kenai area and the City of Kenai. This economic activity results in a temporary population increase in Soldotna of 51 at the peak of this scenario (see Table 90). By 1985, exploration activity in Lower Cook Inlet ceases and the related employees and their dependents either depart the area or are absorbed into other areas of the local economy.

In general, compared to growth accruing under the base case, the exploration only scenario contributes only little to the demand for new public services and facilities, and then only during the three year exploration period (see Table 91 to 100).

TABLE 90

FORECAST OF POPULATION
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - CITY OF SOLDOTNA
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,821	28	12	2,861
1983	2,839	35	16	2,890
1984	3,021	8	4	3,033
1985				
1986				
1987				
1988				
1989		1985-2000 is same as Base Case.		
1990				
1991				
992				
993				
994				
995				
996				
997				
998				
999				
000				

Source: Alaska Consultants, Inc.

TABLE 91

FORECAST OF NET CHANGE IN HOUSING DEMAND
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	198	60	34	11	15
1983	29	9	5	1	3
1984	143	43	24	7	12
1985	90	27	15	4	8
1986					
1987					
1988					
1989					
1990	1986 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
TOTAL	2,004	608	341	99	168

Source: Alaska Consultants, Inc.

TABLE 92

ESTIMATED DEMAND FOR RESIDENTIAL LAND
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	78	14.0	5.5	19.5
Multifamily & Trailer	61	5.5	2.1	7.6
1986-90				
Single Family	128	23.0	9.0	3.2.0
Multifamily & Trailer	100	9.0	3.5	12.5
1991-95				
Single Family	74	13.3	5.2	18.5
Multifamily & Trailer	59 ,	5.3	2.1	7.4
1996-2000				
Single Family	61	11.0	4.3	15.3
Multifamily & Trailer	47	4.2	1.6	5.8
TOTAL	608	85.3	33.3	118.6

a_/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 93

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
-1982 -.2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	357	186	543
1983	360	188	548
1984	379	197	576
1985			
1986			
1987			
988			
989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 94

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Daily Treatment Capacity 1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	543	67.9
1983	548	68.5
1984	576	72.0
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 95

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
EXPLORATION ONLY SCENARIO
SOLDOTNA AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,729
1983	10,838
1984	11,374
1985	
1986	
1987	
1988	
1989	
1990	1985 - 2000 is same as Base Case.
1991	
1992	
1993	
1994	
1995	
1996	
1997	
1998	
1999	
2000	

Source: Alaska Consultants, Inc.

TABLE 96

ESTIMATED DISPOSABLE SOLID WASTES
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,793	16,926
1983	2,878	17,441
1984	3,081	18,671
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 97

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	867	1,118	70
1983	876	1,139	21
1984	919	1,204	65
1985	946	1,249	45
1986			
1987			
1988			
1989			
1990	1986 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 98

SCHOOL ENROLLMENT FORECAST
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	343	229	572
1983	347	231	578
1984	364	243	607
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 99

GENERAL FUND
REVENUE FORECAST
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 556	$ 590	$ 564	$ 474	$2,184
1983	561	596	570	478	2,205
1984	589	626	575	502	2,292
1985					
1986					
1987					
1988					
1989					
1990	1985 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 100

FORECAST OF REVENUES AND OPERATING EXPENDITURES
EXPLORATION ONLY SCENARIO
CITY OF SOLDOTNA
1982 - 2000
$1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$2,184	$1,641	$ 543
1983	2,205	1,657	548
1984	2,292	1,739	553
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ The City of Soldotna does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Homer

COMMUNITY FORECASTS - EXPLORATION ONLY SCENARIO

Significant Factors Affecting Growth

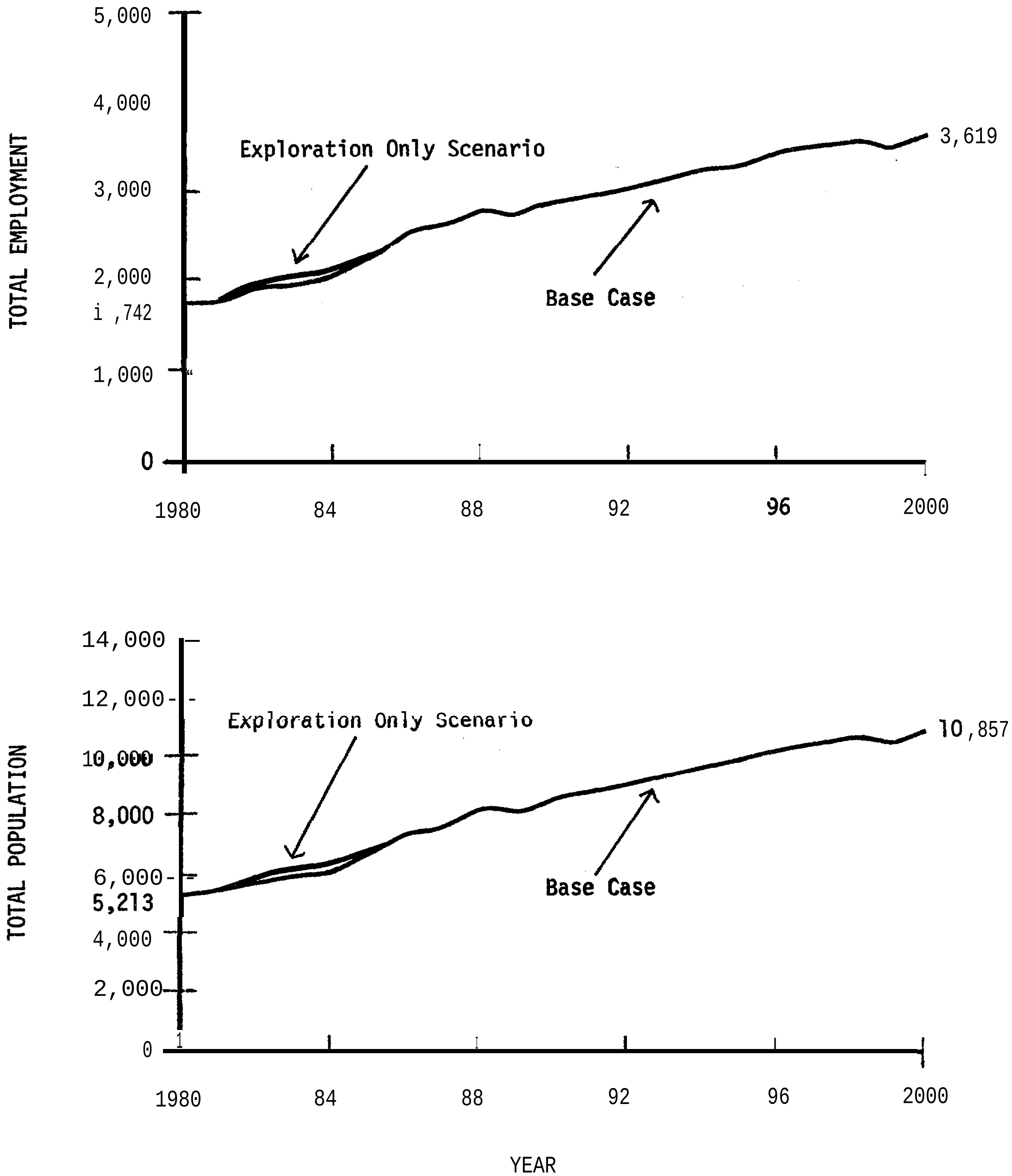
Under this scenario, Homer Airport serves as the base for transport of offshore personnel and some light supplies, while the Port of Homer functions to provide minor marine support. Growth impacts on the community are minor and limited to the three year exploratory period (see Table 101). Homer is already the center of helicopter support services for Sale CI activity in Lower Cook Inlet and is, therefore, an obvious choice to support exploration activity for Sale #60. Shelikof Strait and Lower Cook Inlet operations at their peak add an estimated 99 jobs to the Homer area which support a temporary maximum population increase of 247 during the exploration only scenario (see Table 69). This OCS-related population is about evenly divided geographically between the Cityof Homer and other smaller settlements in the Homer area.

By 1985, however, exploration activities are terminated and there is no further activity at Homer in connection with this scenario. All related employees and their dependents either depart the area or are absorbed by other areas of the economy.

Compared to growth resulting from general economy expansion and the economic stimulus provided by Sale CI, this scenario stimulates very

FIGURE 5

Homer Area
Total Employment and Total Population
Base Case and Exploration Only Scenario
Lower Cook Inlet
1980 - 2000



Source: Alaska Consultants, Inc.

TABLE 101

FORECAST OF POPULATION
EXPLORATION ONLY SCENARIO
LOWER COOK INLET - CITY OF HOMER
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,450	53	38	2,541
1983	2,610	71	53	2,734
1984	2,793	15	9	2,817
1985				
1986				
1987				
1988				
1989	1985-2000 is same as Base Case.			
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				

Source: Alaska Consultants, Inc.

little demand for new public facilities and services in the City of Homer (see Tables 102 to 111).

TABLE 102

FORECAST OF NET CHANGE IN HOUSING DEMAND
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

Year	Net Population Change	Net Change Demand For Housing Units	Single Family	Multi-Family	Trailer
1982	251	76	46	6	24
1983	193	58	35	5	18
1984	83	25	15	2	8
1985	238	71	43	5	23
1986					
1987					
1988					
1989					
1990	1986 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
TOTAL	3,139	951	572	76	303

Source: Alaska Consultants, Inc.

TABLE 103

ESTIMATED DEMAND FOR RESIDENTIAL LAND
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	139	25.0	9.7	34.7
Multifamily & Trailer	91	8.2	3.2	11.4
1986-90				
Single Family	224	40.3	15.7	56.0
Multifamily & Trailer	148	13.3	5.2	18.5
1991-95				
Single Family	116	20.9	8.1	29.0
Multifamily & Trailer	78	7.0	2.7	9.7
1996-2000				
Single Family	93	16.7	6.5	23.2
Multifamily & Trailer	62	5.6	2.2	7.8
TOTAL	951	137.0	53.3	190.3

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 104

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Industrial Capacity	Total Capacity
1982	315	653	968
1983	338	710	1,048
1984	351	685	1,036
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 105

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	318	39.8
1983	342	42.8
1984	353	44.1
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 106

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
EXPLORATION ONLY SCENARIO
HOMER AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,254
1983	10,992
1984	11,246
1985	
1986	
1987	
1988	
1989	
1990	1985 - 2000 is same as Base Case.
1991	
1992	
1993	
1994	
1995	
1996	
1997	
1998	
1999	
2000	

Source: Alaska Consultants, Inc.

TABLE 107

ESTIMATED DISPOSABLE SOLID WASTES
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,563	15,243
1983	2,930	17,366
1984	2,900	17,480
1985		
1986		
1987		
1988		
1989		
1990	1985 - 2000 is same as Base Case.	
1991		
1992		
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 108

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	770	993	105
1983	828	1,076	83
1984	853	1,117	41
1985	924	1,220	103
1986			
1987			
1988			
989			
990	1986 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
199/			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 109

SCHOOL ENROLLMENT FORECAST
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	305	203	508
1983	328	219	547
1984	338	226	564
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

Source: Alaska Consultants, Inc.

TABLE 110

GENERAL FUND
REVENUE FORECAST
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 619	N/A	$ 407	$ 98	$1,124
1983	667	N/A	438	105	1,210
1984	688	N/A	452	108	1,248
1985					
1986					
1987					
1988					
1989					
1990	1985 - 2000 is same as Base Case.				
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 111

FORECAST OF REVENUES AND OPERATING EXPENDITURES
EXPLORATION ONLY SCENARIO
CITY OF HOMER
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,124	$1,011	$ 113
1983	1,210	1,087	123
1984	1,248	1,122	126
1985			
1986			
1987			
1988			
1989			
1990	1985 - 2000 is same as Base Case.		
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			

a/ The City of Homer does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

PROJECTIONS OF GROWTH - MEAN SCENARIO

Introduction

The mean and the other two OCS petroleum scenarios or cases which form the basis of the socioeconomic impact assessment for Kenai, Soldotna and Homer in this study were selected by the U.S. Bureau of Land Management's Alaska OCS Office and developed by Dames and Moore from U.S. Geological Survey resource estimates. Although reasonably precise locations, quantities, methods of operation and time frames are necessary to the development of plausible scenarios, such scenarios and their impacts should not be interpreted as forecasts of what is actually going to happen. There is far too much uncertainty in oil and gas exploration and development for this degree of precision. However, an indication is given of the type and scale of activities which could impact Lower Cook Inlet communities and the extent to which individual communities would logically be impacted.

Following the September 1981 lease sale, exploration begins in 1982, peaks in 984 and terminates in 1985 with a total of 40 wells drilled: 16 exploratory wells and 2 delineation wells in Lower Cook Inlet and 20 exploratory wells and 2 delineation wells in Shelikof Strait. Exploration activities in both Shelikof Strait and Lower Cook Inlet are supported by the existing marine base at Nikiski and forward base at Homer. Ultimately, two commercial fields are found, one of 500 million barrels in Shelikof Strait and a second, smaller find of 198 million barrels in Lower Cook

Inlet. No natural gas discoveries of commercial value are made (see Figures 6 and 7 and Table 112).

Field development begins in 1985 and production platforms are installed in both fields in 1987. Production in the Cook Inlet field begins in 1989 but does not reach peak capacity of 28 million barrels per year until 1991 when the full complement of 40 production wells is completed. The productive life of the Cook Inlet field is 14 years. In 2002, two years beyond the forecast period, production in the field ceases.

Production in the larger Shelikof field also begins in 1989, peaks at 70 million barrels annually in 1991-1992 and continues with declining volumes through 2006.

Because of its great distance from existing Cook Inlet facilities, most development and production support for the giant Shelikof field is provided from the west coast of Afognak Island, although some additional construction support is provided by Nikiski and Seward. Due to the circumstances of this scenario, the greater part of the oil reserves discovered as a result of Lower Cook Inlet OCS Sale #6o are produced with little impact on Kenai Peninsula communities.

Construction support for the smaller Cook Inlet field is provided from Nikiski and the existing forward support base at Homer which is used to ferry workers back and forth and to transport light supplies. Oil from the Lower Cook Inlet field is transported by an existing pipeline to processing facilities at Nikiski.

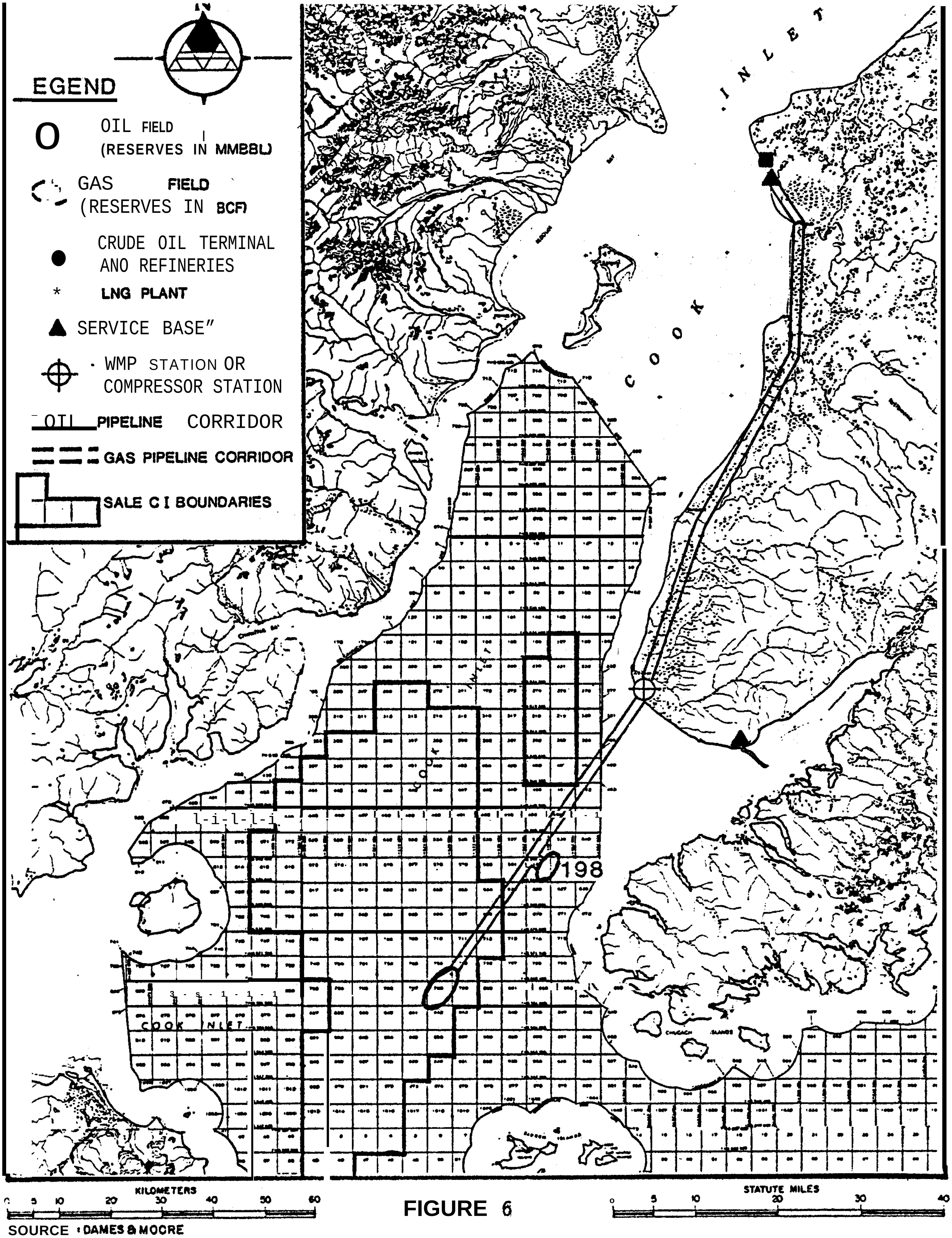
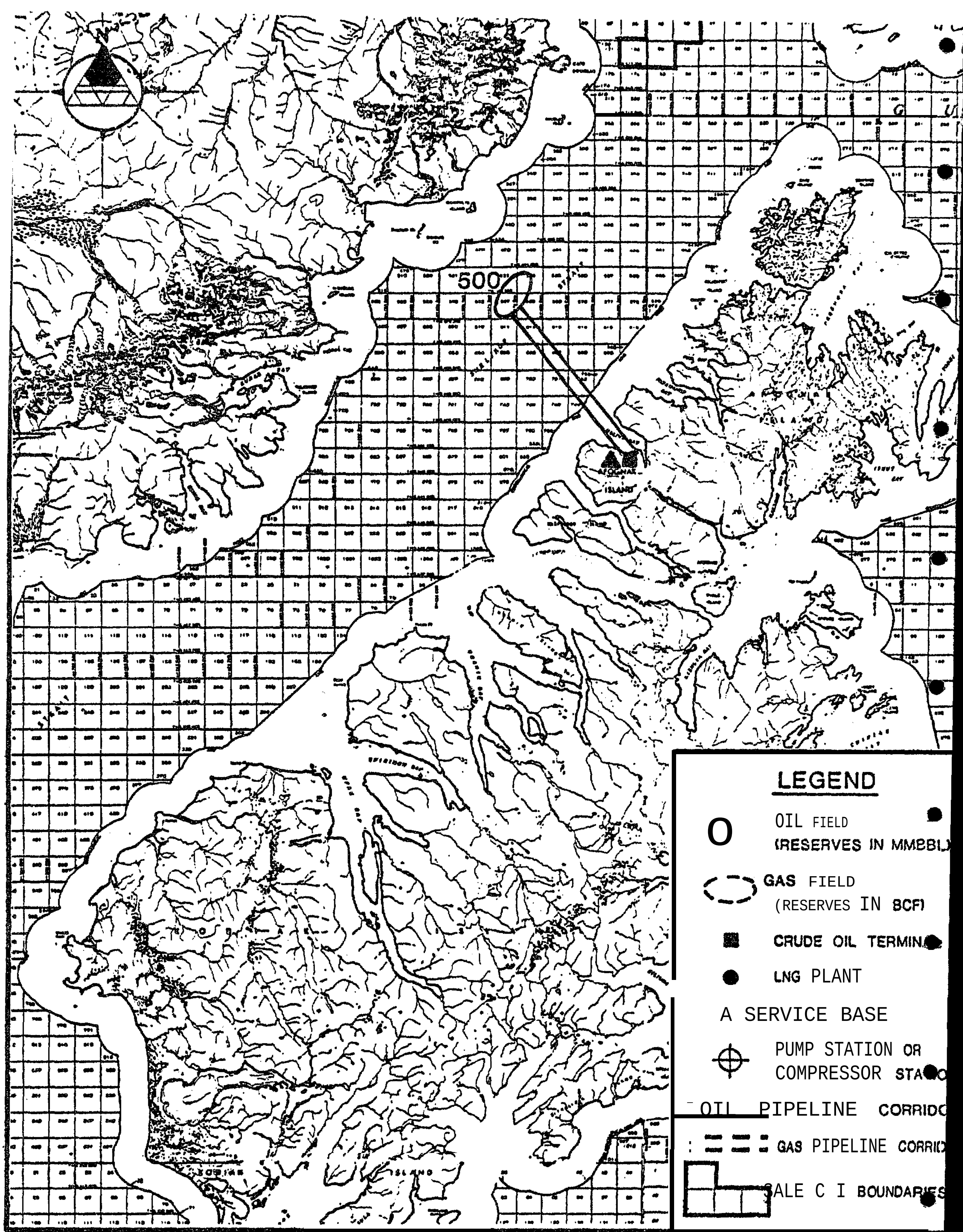


FIGURE 6

LOWER COOK INLET
MEDIUM FIND SCENARIO
FIELD AND SHORE FACILITY LOCATIONS



KILOMETERS 0 5 10 20 30 40 50 60

STATUTE MILES 0 5 10 20 30

FIGURE 7

SOURCE: DAMES & MOORE

SHELIKOF STRAIT
MEDIUM FIND SCENARIO
FIELD AND SHORE FACILITY LOCATIONS

TABLE 112

ASSUMPTIONS FOR THE DISTRIBUTION OF EMPLOYMENT
AMONG THE COASTAL AREAS OF KENAI, HOMER AND AFOGNAK ISLAND
MEAN PROBABILITY RESOURCE LEVEL SCENARIO
LOWER COOK INLET

Phase, Task and Area of Operations	Kenai	Homer	Afognak Island
EXPLORATION			
Survey			
Offshore Geophysical and Geological Surveying [area of operation]	Not Applicable	Survey vessels conducting geophysical and geological surveys in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Survey vessels conducting geophysical and geological surveys in Shelikof Strait outside the Kenai-Cook Inlet coastal area.
Onshore Service Base	Not Applicable	Temporary (advance) service base providing resupply and communications for vessels surveying in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Rigs			
Offshore Exploration Well Drilling [area of operation]	Not Applicable	Rigs drilling exploration wells in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Rigs drilling exploration wells in Shelikof Strait outside the Kenai-Cook Inlet coastal area.

Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Onshore Service" Base	Existing shore base supplying rigs and boats in Lower Cook Inlet and and Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo.	Advance shore base supplying rigs and boats in Lower Cook Inlet with fuel, water, mud, cement, food and other cargo.	Not Applicable
Air Transportation	Not Applicable	Helicopter service from Homer Airport transporting offshore personnel and small volume, light weight freight to and from rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Construction	Not Applicable	Not Applicable	Constructing a permanent service base on Afognak Island.
DEVELOPMENT			
<u>Platform Installation and Offshore Pipeline Construction</u>			
Offshore Platform Installation [area of operation]	Not Applicable	Locating, installing and commissioning a platform in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Locating, installing and commissioning a platform in Shelikof Strait outside the Kenai-Cook Inlet coastal area.

Pipeline Construction [area of operation]	Not Applicable	Laying and burying a short subsea oil trunk line to an existing subsea oil line in Lower Cook Inlet.	Laying and burying a subsea oil pipeline from Shelikof Strait platform to Afognak Island.
Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to a platform, lay barge and bury barge in Lower Cook Inlet. Two-thirds of this effort will be provided from the Kenai area.	Supply/anchor/tug boats transporting materials to a platform, lay barge and bury barge in Lower Cook Inlet. One-third of this effort will be provided from Homer.	Supply/anchor/tug boats transporting materials to a platform, lay barge, and bury barge in Shelikof Strait.
Onshore Service Base	Shore base supplying boats, a platform, lay barge and bury barge with tubular materials, fuel, water, food and other cargo. Two-thirds of this effort for platform installation and pipeline construction in Lower Cook Inlet will be provided from the Kenai area.	Shore base supplying boats, a platform, lay barge and bury barge with fuel, water, food and other cargo. One-third of this effort for platform installation and pipeline construction in Lower Cook Inlet will be provided from Homer.	Shore base supplying boats, a platform, lay barge and bury barge with tubular materials, fuel, water, food and other cargo. The total effort for platform installation and pipeline construction in Shelikof Strait will be provided from Afognak Island.
Air Transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, light weight freight to platforms, lay barges and bury barges in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Construction	Coating of all pipe used in subsea pipelines in the Kenai area.	Not Applicable	Constructing onshore pipeline and oil terminal on Afognak Island.

Platforms			
Offshore Development Drilling [area of operation]	Not Applicable	Development drilling on platforms in Lower Cook Inlet outside the **Kenai-Cook** Inlet coastal area.	Development drilling on a platform in **Shelikof** Strait outside the **Kenai-Cook** Inlet coastal area.
Marine Transportation [port **area]**	Supply boats transporting materials to a platform in Lower Cook Inlet.	Supply boats transporting materials to a platform in Lower Cook Inlet.	Supply boats transporting materials to a platform in **Shelikof** Strait.
Onshore Service Base	Shore base supplying boats and a platform in Lower Cook Inlet with with tubular materials, fuel, water, mud, cement, food and other cargo. Two-thirds of this effort provided from the **Kenai** area.	Shore base supplying boats and a platform in Lower Cook Inlet with fuel, water, mud, cement, food and other cargo. One-third of this effort provided from Homer.	Shore base supplying boats and a platform in **Shelikof** Strait with tubular materials, fuel, water, mud, cement, food and other cargo.
Air transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, lightweight freight to platforms in Lower Cook Inlet and **Shelikof** Strait.	Not Applicable
PRODUCTION			
Platforms			
Offshore Platform Operations [area of operation]	Not Applicable	Operating platform with periodic **workovers and well** stimulation in Lower Cook **Inlet.**	Operating platform with workovers and well stimulation in **Shelikof** Strait.

Marine Transportation [port area]	Supply boats transporting materials to a platform in Lower Cook Inlet. All of this effort in Lower Cook Inlet will be provided from the Kenai area.	Not Applicable	Supply boats transporting materials to a platform in Shelikof Strait.
Onshore Service Base	Shore base providing all of the effort in supplying boats and a platform in Lower Cook Inlet with tubular materials, fuel, water, mud, cement, food and other cargo.	Not Applicable	Shore base supply boats and a platform in Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo. Afognak Island service base employees assumed to be rotated through Homer.
Oil Terminal Operations	The use of existing facilities in the Nikiski area is assumed.	Not Applicable	Operating oil terminal storing and shipping oil from the Shelikof Strait field. Afognak oil terminal employees assumed to be rotated through Homer.

Source: Alaska Consultants, Inc. Derived from facility and OCS employment scenarios prepared by Dames and Moore.

TABLE 113

FORECAST OF TOTAL EMPLOYMENT FROM MEAN SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area	Southern Peninsula Area	Total
1982	68	72	140
1983	89	99	188
1984	89	99	188
1985	60	64	124
1986	4	4	8
1987	126	112	228
1988	209	187	396
1989	217	215	432
1990	314	303	617
1991	314	303	617
1992	272	276	548
1993	182	187	369
1994	234	228	462
1995	234	228	462
1996	234	228	462
1997	234	228	462
1998	234	228	462
1999	234	228	462
2000	234	228	462

Source: Alaska Consultants, Inc.

TABLE 114

FORECAST OF TOTAL POPULATION FROM MEAN SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area			Southern Peninsula Area		Total
	City of Kenai	City of Soldotna	Remaining Area	City of Homer	Remaining Area	
1982	46	52		91	89	350
1983	60	52	1;:	124	1 23	469
1984	60	52	110	124	123	469
1985	40	36	74	80	80	310
1986	3	3		5		20
1987			15!	1 40	14:	595
1988	1!:	1;:	257	237	234	970
1989	137	134	272	269	268	1,080
1990	200	193	392	379	379	1,543
1991	200	193	392	379	379	1,543
1992	172	169	339	345	345	i ,370
1993	115	113	227	234	234	923
1994	149	144	292	285	285	1,155
1995	149	144	292	285	285	1,155
1996	149	144	292	285	285	1,155
1997	149	144	292	285	285	1,155
1998	149	144	292	285	285	1,155
1999	149	144	292	285	285	1,155
2000	149	144	292	285	285	1,155

Source: Alaska Consultants, Inc.

TABLE 115

FORECAST OF POPULATION
MEDIUM FIND SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	27,270	215	135	27,620
1983	26,851	284	185	27,320
1984	27,368	284	185	27,837
1985	28,588	220	90	28,898
1986	30,157	20		30,177
1987	31,120	438	15;	31,715
1988	32,385	858	112	33,355
1989	32,530	1,010		33,610
1990	33,469	1,440	1::	35,012
1991	34,084	1,440	103	35,627
1992	35,031	1,307	63	36,401
1993	35,907	865	58	36,830
1994	36,837	1,067 "	88	37,992
1995	37,770	1,067	88	38,925
1996	38,745	1,067	88	39,900
1997	39,554	1,067	88	40,709
1998	40,399	1,067	88	41,554
1999	40,524	1,067	88	41,679
2000	41,607	1,067	88	42,762

Source: Alaska Consultants, Inc.

TABLE 118

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET - KENAI AREA
1982 - 2000

Year	Service Base	Helicopter Service			Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
		Exploration	Development	Production								
1982	16											16
1983	21											21
1984	21											21
1985	11											11
1986	0											0
1987	25											25
1988	15								14			29
1989	10											10
1990	17											17
1991	17											17
1992	7											7
1993	5											5
1994	13											13
1995	13											13
1996	13											13
1997	13											13
1998	13											13
1999	13											13
2000	13											13

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 119

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET - CENTRAL PENINSULA AREA (KENA)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	16	8	24		24	60	60
1983	21	11	32		32	80	80
1984	21	11	32		32	80	80
1985	11	5	16		16	40	40
1986	0	0	0		0	0	0
1987	25	13	38		38	95	95
1988	29	8	37	14	23	58	72
1989	10	5	15		15	38	38
1990	17	9	26		26	65	65
1991	17	9	26		26	65	65
1992	7	3	10		10	25	25
1993	5	3	8		8	20	20
1994	13	7	20		20	50	50
1995	13	7	20		20	50	50
1996	13	7	20		20	50	50
1997	13	7	20		20	50	50
1998	13	7	20		20	50	50
1999	13	7	20		20	50	50
2000	13	7	20		20	50	50

Source: Alaska Consultants, Inc.

TABLE 120

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET - HOMER AREA
1982 - 2000

Year	Survey	Rigs	Platforms		Supply/Anchor/Tug Boats			Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
			Development Drilling	Operations	Exploration	Development	Production			
1982	19	56			26					101
1983	25	112			35					172
1984	27	112			35					174
1985	12	37			17					66
1986										0
1987						15		146		161
1988			112			6				122
1989			112	25						137
1990			112	50						162
1991			112	50						162
1992				50						50
1993				50						50
1994				65						65
1995				65						65
1996				65						65
1997				65						65
1998				65						65
1999				65						65
2000				65						65

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 121

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE Development_/
MEDIUM FIND SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1982	28	14	42	105
1983	38	19	57	142
1984	38	19	57	142
1985	29	15	44	110
1986	3	1	4	10
1987	58	29		218
1988	114	57	1;;	428
1989	135	67	202	505
1990	192	96	288	720
1991	192	96	288	720
1992	174	87	261	652
1993	115	57	172	430
1994	142	71	213	532
1995	142	71	213	532
1996	142	71	213	532
1997	142	71	213	532
1998	142	71	213	532
1999	142	71	213	532
2000	142	71	213	532

a/ OCS offshore development includes the OCS onshore development outside of the Kenai-Cook Inlet coastal area such as the OCS onshore development on Afognak Island.

Source: Alaska Consultants, Inc.

TABLE 122

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
MEDIUM FIND SCENARIO
LOWER COOK INLET - HOMER ARER
1982 - 2000

Year	Service Base	Helicopter Service Exploration	Helicopter Service Development	Helicopter Service Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1982	9	15										24
1983	13	20										33
1984	13	20										33
1985	6	10										16
1986	0											0
1987	12		6									18
1988	8		3									11
1989	5		2	2								9
1990				10								10
1991				10								10
1992				10								10
1993				10								10
1994				10								10
1995				10								10
1996				10								10
1997				10								10
1998				10								10
1999				10								10
2000				10								10

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 123

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
MEDIUM FIND SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	24	6	30		30	75	75
1983	33	9	42		42	105	105
1984	33	9	42		42	105	105
1985	16	4	20		20	50	50
1986	0	0	0		0	0	0
1987	18	7	25		25	62	62
1988	11	5	16		16	40	40
1989	9	4	13		13	32	32
1990	10	5	15		15	38	38
1991	10	5	15		15	38	38
1992	10	5	15		15	38	38
1993	10	5	15		15		
1994	10	5	15		15	38	38
1995	10	5	15		15	38	38
1996	10	5	15		15	38	38
1997	10	5	15		15	38	38
1998	10	5	15		15	38	38
1999	10	5	15		15	38	38
2000	10	5	15		15	38	38

Source: Alaska Consultants, Inc.

Kenai

COMMUNITY FORECASTS - MEAN SCENARIO

Significant Factors Affecting Growth

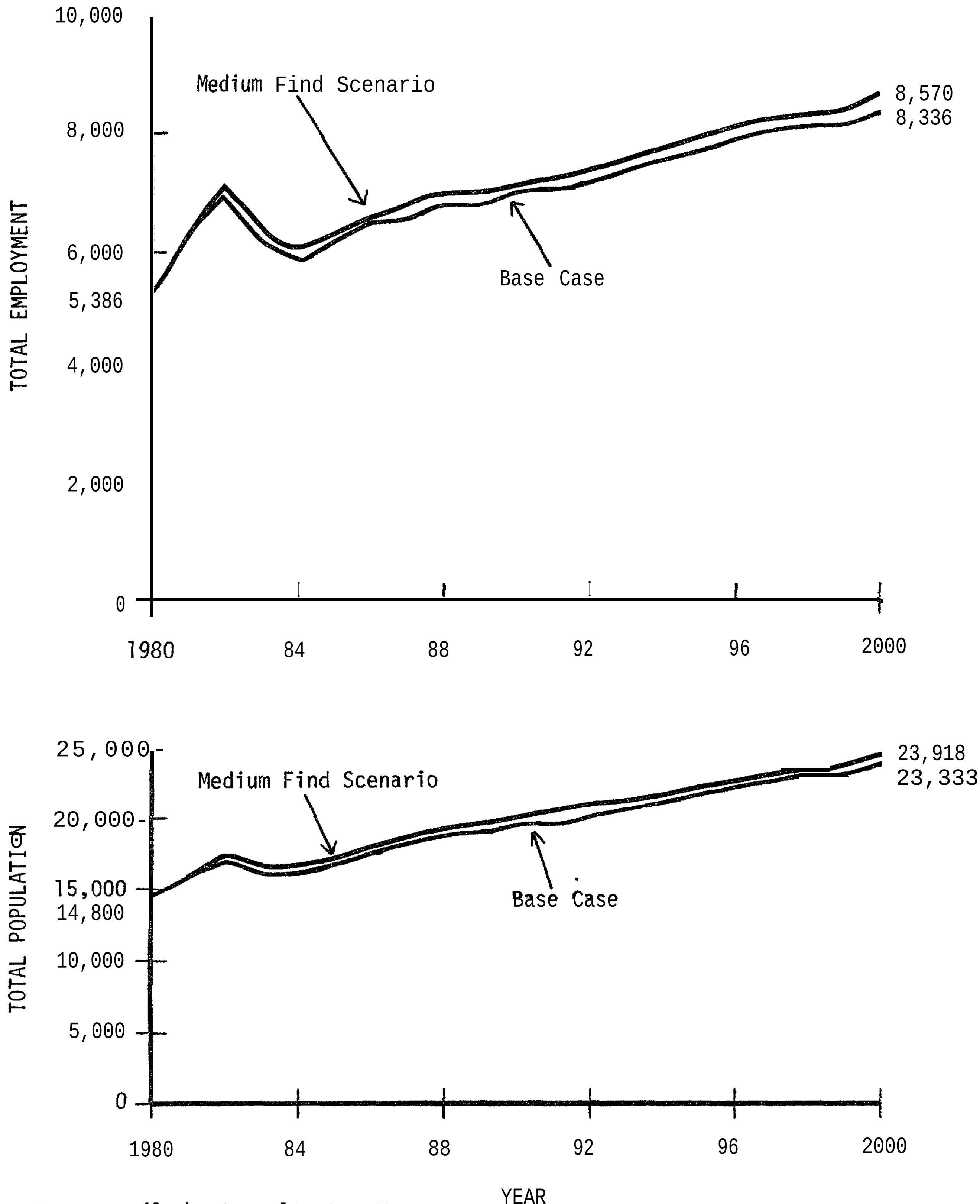
Under the mean scenario for Sale #60, the existing marine support facilities at Nikiski and a forward 'base at Homer provide all support for both the Lower Cook Inlet and Shelikof Strait fields through the exploration phase. Then support for the development and production of the Shelikof Strait field shifts to Afognak Island, where a new service base and oil terminal are constructed to service the Shelikof Strait oil field. For the smaller and more accessible Lower Cook Inlet field, however, existing service facilities at Nikiski are used to provide primary marine support through the development and production phases. The crude oil produced from the Lower Cook Inlet field is transported to Nikiski for the most part by existing pipeline systems to be processed there in facilities originally built to handle older Cook Inlet fields.

Overall, this scenario anticipates very moderate impacts at Kenai for two reasons.

First, the bulk (nearly two-thirds) of the jobs nominally attributed to the Central Peninsula or Kenai area derive from jobs actually located offshore in the Lower Cook Inlet and Shelikof Strait fields or on Afognak Island. These are jobs held by residents in the Central Peninsula area.

FIGURE 8

Kenai - Soldotna Area
Total Employment and Total Population
Base Case and Medium Find Scenario
Lower Cook Inlet
1980 - 2000



Source: Alaska Consultants, Inc.

TABLE 124

FORECAST OF POPULATION
MEDIUM FIND SCENARIO
LOWER COOK INLET - CITY OF KENAI
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	4,982	28	18	5,028
1983	5,027	36	24	5,087
1984	5,116	36	24	5,176
1985	5,268	28	12	5,308
1986	5,407	3	0	5,410
1987	5,560		29	5,644
1988	5,662	1::	17	5,787
1989	5,694	126	11	5,831
1990	5,734	180	20	5,934
1991	5,838	180	20	6,038
1992	5,980	164	8	6,152
1993	6,115	109	6	6,230
1994	6,259	134	15	6,408
1995	6,401	134	15	6,550
1996	6,552	134	15	6,701
1997	6,668	134	15	6,817
1998	6,800	134	15	6,949
1999	6,830	134	15	6,979
2000	7,000	134	15	7,149

Source: Alaska Consultants, Inc.

Most of the employment truly occurring in the Kenai area involves indirect jobs generated as a result of new basic offshore employment. As for timing, areawide employment grows little during exploration, climbs during field development to peak at about 314 jobs in 1990-1991 and then falls off to a level of 234 for the rest of the forecast period.

Second, the total population growth associated with this new employment in the Central Peninsula area has been approximately allocated among the City of Kenai (25 percent), the City of Soldotna (25 percent) and the remaining Central Peninsula area (50 percent), mainly the unincorporated North Kenai area.

Thus, the physics< impacts of the job and population growth accru ng in the City of Kens< under this scenario are effectively diminished · n scale since the · mpacts are spread throughout the whole Central Peninsula area. According to the forecast, the mean scenario adds at peak some 200 residents (or about 3.5 percent) to the City of Kenai's population base and substant· ally less than that during the rest of the forecast period.

The single most important effect on community infrastructure from the mean scenario comes in the demand for additional housing units which is particularly heavy at the beginning of exploration and again from 1987 to 1990. However, the overall impact on public facilities and services is not appreciable, especially when compared to the growth stimulated by economic expansion assumed to occur during the base case (see Tables 125 to 134).

TABLE 125

FORECAST OF NET CHANGE IN HOUSING DEMAND
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi - Family	Trailer
1982	116	37	19	12	6
1983	59	19	10	6	3
1984		28	15	9	4
1985	1:;	42	22	14	6
1986	102	32	17	10	5
1987	234	74	39	24	11
1988	143	45	23	15	7
1989		14	7	5	2
1990	1::	33	17	11	5
1991	104	33	17	11	5
1992	114	36	19	12	5
1993	78	25	13	8	4
1994	178	56	29	19	8
1995	142	45	23	15	7
1996	151	48	25	16	7
1997	116	37	19	12	6
1998	132	42	22	14	6
1999		10	5	3	2
2000	1;;	54	28	18	8
TOTAL	2,237	710	369	234	107

Source: Alaska Consultants, Inc.

TABLE 126

ESTIMATED DEMAND FOR RESIDENTIAL LAND
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	66	11.9	4.6	16.5
Multifamily & Trailer	60	5.4	2.1	7.5
1986-90				
Single Family	103	18.5	7.2	25.7
Multifamily & Trailer	95	8.6	3.3	11.9
1991-95				
Single Family	101	18.2	7.1	25.3
Multifamily & Trailer	94	8.5	3.3	11.8
1996-2000				
Single Family	99	17.8	6.9	24.7
Multifamily & Trailer	92	8.3	3.2	11.5
TOTAL	710	97.2	37.7	134.9

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 127

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	628	226	854
1983	636	229	865
1984	647	233	880
1985	664	239	903
1986	676	244	920
1987	706	255	961
1988	723	261	984
1989	729	263	992
1990	742	267	1,009
1991	755	272	1,027
1992	769	277	1,046
1993	779	281	1,060
1994	801	289	1,090
1995	819	295	1,114
1996	838	302	1,140
1997	852	307	1,159
1998	869	313	1,182
1999	872	314	1,186
2000	893	322	1,215

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 128

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	854	106.8
1983	865	108.1
1984	880	10.0
1985	903	12.9
1986	920	15.0
1987	961	20.1
1988	984	23.0
1989	992	24.0
1990	1,009	26.1
1991	1,027	128.4
1992	1,046	130.8
1993	1,060	132.5
1994	1,090	136.2
1995	1,114	139.2
1996	1,140	142.5
1997	1,159	144.9
1998	7,182	147.8
1999	1,186	148.2
2000	1,215	151.9

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 129

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
MEDIUM FIND SCENARIO
KENAI AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	23,474
1983	20,986
1984	30,710
1985	31,454
1986	31,954
1987	32,639
1988	32,393
1989	32,516
1990	32,902
1991	33,292
1992	33,720
1993	34,012
1994	34,680
1995	35,212
1996	35,779
1997	36,214
1998	36,709
1999	36,171
2000	26,809

Source: Alaska Consultants, Inc.

TABLE 130

ESTIMATED DISPOSABLE SOLID WASTES
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	6,612	39,492
1983	5,758	34,126
1984	5,493	32,802
1985	5,688	34,041
1986	6,027	35,973
1987	6,349	37,694
1988	6,558	38,674
1989	6,620	39,055
1990	6,873	40,204
1991	6,993	40,932
1992	7,041	41,511
1993	7,122	42,002
1994	7,334	43,288
1995	7,489	44,227
1996	7,653	45,221
1997	7,715	45,885
1998	7,855	46,734
1999	7,752	46,688
2000	7,937	47,809

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 131

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	1,596	2,059	63
1983	1,615	2,100	41
1984	1,643	2,152	52
1985	1,685	2,224	72
1986	1,717	2,284	60
1987	1,791	2,400	116
1988	1,836	2,479	79
1989	1,850	2,516	37
1990	1,883	2,580	64
1991	1,916	2,644	64
1992	1,952	2,713	69
1993	1,977	2,768	55
1994	2,033	2,846	78
1995	2,078	2,909	63
1996	2,126	2,976	67
1997	2,163	3.028	52
1998	2,205	3,087	59
1999	2,215	3,101	14
2000	2,269	3,177	76

Source: Alaska Consultants, Inc.

TABLE 132

SCHOOL ENROLLMENT FORECAST
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	604	402	1,006
1983	610	407	1,017
1984	621	414	1,035
1985	637	425	1,062
1986	649	433	1,082
1987	677	452	1,129
1988	694	463	1,157
1989	700	466	1,166
1990	712	475	1,187
1991	725	483	1,208
1992	740	494	1,234
1993	748	498	1,246
1994	769	513	1,282
1995	786	524	1,310
1996	804	536	1,340
1997	818	545	1,363
1998	834	556	1,390
1999	838	558	1,396
2000	858	572	1.430

Source: Alaska Consultants, Inc.

TABLE 133

GENERAL FUND
REVENUE FORECAST
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000
($1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental 1 Revenues	Other a/	Total
1982	$1,518	$ 952	$ 846	$ 278	$3,594
1983	1,536	963	856	281	3,636
1984	1,562	980	871	286	3,699
1985	1,602	1,005	893	293	3,793
1986	1,633	1,024	910	299	3,866
1987	1,704	1,068	950	312	4,034
1988	1,747	1,095	974	320	4,136
1989	1,760	1,104	981	322	4,167
990	1,791	1,123	998	328	4,240
991	1,823	1,143	1,016	334	4,316
992	1,857	1,165	1,035	340	4,397
993	1,881	1,179	1,048	344	4,452
994	1,934	1,213	1,078	354	4,579
995	1,977	1,240	1,102	362	4,681
1996	2,023	1,268	1,128	370	4,789
1997	2,058	1,290	1,147	377	4,872
1998	2,096	1,315	1,169	384	4,964
1999	2,107	1,321	1,174	386	4,988
2000	2,158	1,353	1,203	395	5,109

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 134

FORECAST OF REVENUES AND OPERATING EXPENDITURES
MEDIUM FIND SCENARIO
CITY OF KENAI
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$3,594	$2,492	$1,102
1983	3,636	2,521	1,115
1984	3,699	2,565	1,134
1985	3,793	2,631	1,162
1986	3,866	2,682	1,184
1987	4,034	2,797	1,237
1988	4,136	2,868	7,268
1989	4,167	2,890	1,277
1990	4,240	2,941	1,299
1991	4,316	2,992	1,324
1992	4,397	3,049	1,348
1993	4,452	3,087	1,365
1994	4,579	3,176	1,403
1995	4,681	3,246	1,435
1996	4,789	3,321	1,468
1997	4,872	3,378	1,494
1998	4,964	3,444	1,520
1999	4,988	3,459	1,529
2000	5,109	3,543	1,566

a/ The City of Kenai does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Soldotna

COMMUNITY FORECASTS - MEAN SCENARIO

Significant Factors Affecting Growth

The consequences of the mean scenario for Sale #60 upon the City of Soldotna are forecast to be very similar in scale and timing to Sale #60's effects upon the City of Kenai, for the two cities share a common role as a place of residence for offshore employees and for onshore OCS-related workers concentrated in the North Kenai-Nikiski area. This scenario stimulates a moderate degree of town growth, in two phases. The first phase (1982-1983) responds to the stimulus of exploration activity following Sale #60 and temporarily adds about 52 persons to the population base. The second growth phase occurs during 1988-1990 as field development and production get underway. This scenario is estimated to add about 193 residents at Soldotna in the peak year and about 144 residents during the ongoing production phase.

At the anticipated level of growth for this scenario, the public facilities and services developed to accommodate base case growth appear to be sufficient to absorb scenario growth as well (see Tables 136 to 145).

TABLE 135

FORECAST OF POPULATION
MEDIUM FIND SCENARIO
LOWER COOK INLET - CITY OF SOLDOTNA
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,821	12	28	2,861
1983	2,839	16	36	2,891
1984	3,021	16	36	3,073
1985	3,123	8	28	3,159
1986	3,369	0	3	3,372
1987	3,479	19		3,553
1988	3,708	12	1::	3,828
1989	3,697	8	126	3,831
1990	3,875	13	180	4,068
1991	3,935	13	180	4,128
1992	4,031	5	164	4,200
1993	4,122	4	109	4,235
1994	4,218	10	134	4,362
1995	4,313	10	134	4,457
1996	4,413	10	134	4,557
1997	4,484	10	134	4,628
1998	4,565	10	134	4,709
1999	4,553	10	134	4,697
2000	4,667	10	134	4,811

Source: Alaska Consultants, Inc.

TABLE 136

FORECAST OF NET CHANGE IN HOUSING DEMAND
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	198	60	34	9	17
1983		9	5	1	3
1984	1::	55	31	9	15
1985	86	26	15	4	7
1986	213	65	37	10	18
1987	181	55	31	9	15
1988	275	83	47	13	23,
1989	3	1	1	0	0
1990	237	72	40	12	20
1991	60	18	10	3	5
1992	72	22	12	4	6
1993		11	6	2	3
1994	1;;	38	21	6	11
1995		29	16	5	8
1996	1::	30	17	5	8
1997	71	22	12	4	6
1998	81	25	14	4	7
1999	-12	-4	-2	-1	-1
2000	114	35	20	5	10
TOTAL	2,148	652	367	104	181

Source: Alaska Consultants, Inc.

TABLE 137

ESTIMATED DEMAND FOR RESIDENTIAL LAND
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	85	15.3	6.0	21.3
Multifamily & Trailer	65	5*9	2.3	8.2
1986-90				
Single Family	156	28.1	10.9	39.0
Multifamily & Trailer	120	10.8	4.2	15.0
1991-95				
Single Family	65	11.7	4.6	16.3
Multifamily & Trailer	53	4.8	1.9	6.7
1996-2000				
Single Family	61	11.0	4.3	15.3
Multifamily & Trailer	47	4.2	1.6	5.8
TOTAL	652	91.8	35.8	127.6

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 138

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	357	186	543
1983	361	188	549
1984	384	200	584
1985	395	205	600
1986	422	219	641
1987	444	231	675
1988	477	249	726
1989	479	249	728
1990	508	264	772
1991	516	268	784
1992	525	273	798
1993	529	275	804
1994	545	284	829
1995	557	290	847
1996	569	296	865
1997	578	301	879
1998	588	306	894
1999	587	305	892
2000	601	313	914

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 139

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	543	67.9
1983	549	68.6
1984	584	73.0
1985	600	75.0
1986	641	80.1
1987	675	84.4
1988	726	90.8
1989	728	91.0
1990	772	96.5
1991	784	98.0
1992	798	99.8
1993	804	100.5
1994	829	103.6
1995	847	105.9
1996	865	108.1
1997	879	109.9
1998	894	111.8
1999	892	111.5
2000	914	114.2

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 140

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
MEDIUM FIND SCENARIO
SOLDOTNA AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,729
1983	10,841
1984	11,524
1985	11,846
1986	12,645
1987	13,324
1988	14,355
1989	14,366
1990	15,255
1991	15,480
1992	15,750
1993	15,881
1994	16,358
1995	16,714
1996	17,089
1997	17,355
1998	17,659
1999	17,614
2000	18,041

Source: Alaska Consultants, Inc.

TABLE 141

ESTIMATED DISPOSABLE SOLID WASTES
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,793	16,926
1983	2,879	17,447
1984	3,122	18,919
1985	3,273	19,834
1986	3,529	21,386
1987	3,755	22,755
1988	4,087	24,767
1989	4,131	25,034
1990	4,430	26,846
1991	4,495	27,240
1992	4,574	27,718
1993	4,612	27,949
1994	4,750	28,785
1995	4,854	29,415
1996	4,963	30,076
1997	5,040	30,542
1998	5,128	31,076
1999	5,115	30,997
2000	5,239	31,748

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 142

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	867	1,118	85
1983	876	1,139	21
1984	931	1,220	81
1985	957	1,263	43
1986	1,022	1,359	96
1987	1,077	1,443	
1988	1,160	1,566	1;:
1989	1,161	1,579	13
1990	1,233	1,689	110
1991	1,251	1,726	37
1992	1,273	1,769	43
1993	1,284	1,798	29
1994	1,322	1,851	53
1995	1,351	1,891	40
1996	1,381	1,933	42
1997	1,403	1,964	31
1998	1,428	1,999	35
1999	1,424	1,994	-5
2000	1,459	2,043	49

Source: Alaska Consultants, Inc.

e

TABLE 143

SCHOOL ENROLLMENT FORECAST
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	343	229	572
1983	347	231	578
1984	369	246	615
1985	379	253	632
1986	404	270	674
1987	427	284	711
1988	460	306	766
1989	460	306	766
1990	488	326	814
1991	496	330	826
1992	504	336	840
1993	508	339	847
1994	523	349	872
1995	535	356	891
1996	547	364	911
1997	556	370	926
1998	565	377	942
1999	563	376	939
2000	577	385	962

Source: Alaska Consultants, Inc.

TABLE 144

GENERAL FUND
REVENUE FORECAST
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 556	$ 590	$ 321	$ 474	$1,941
1983	561	596	324	479	1,960
1984	597	634	345	509	2,085
1985	613	652	354	523	2,142
1986	655	695	378	558	2,286
1987	690	733	398	588	2,409
1988	743	790	429	634	2,596
989	744	790	430	634	2,598
990	790	839	456	673	2,758
991	802	851	463	683	2,799
992	816	866	471	695	2,848
993	822	873	475	701	2,871
994	847	900	489	722	2,958
995	865	919	500	738	3,022
996	885	940	511	754	3,090
1997	899	955	519	766	3,139
1998	914	971	528	779	3,192
1999	912	969	527	777	3,185
2000	934	992	539	796	3,261

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 145

FORECAST OF REVENUES AND OPERATING EXPENDITURES
MEDIUM FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,941	$1,641	$ 300
1983	1,960	1,658	302
1984	2,085	1,762	323
1985	2,142	1,812	330
1986	2,286	1,934	352
1987	2,409	2,038	371
1988	2,596	2,195	401
1989	2,598	2,197	401
1990	2,758	2,333	425
1991	2,799	2,367	432
1992	2,848	2,409	439
1993	2,871	2,429	442
1994	2,958	2,502	456
1995	3,022	2,556	466
1996	3,090	2,614	476
1997	3,139	2,654	485
1998	3,192	2,701	491
1999	3,185	2,694	491
2000	3,261	2,759	502

a/ The City of Soldotna does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Homer

COMMUNITY FORECASTS - MEAN SCENARIO

'Significant Factors Affecting Growth

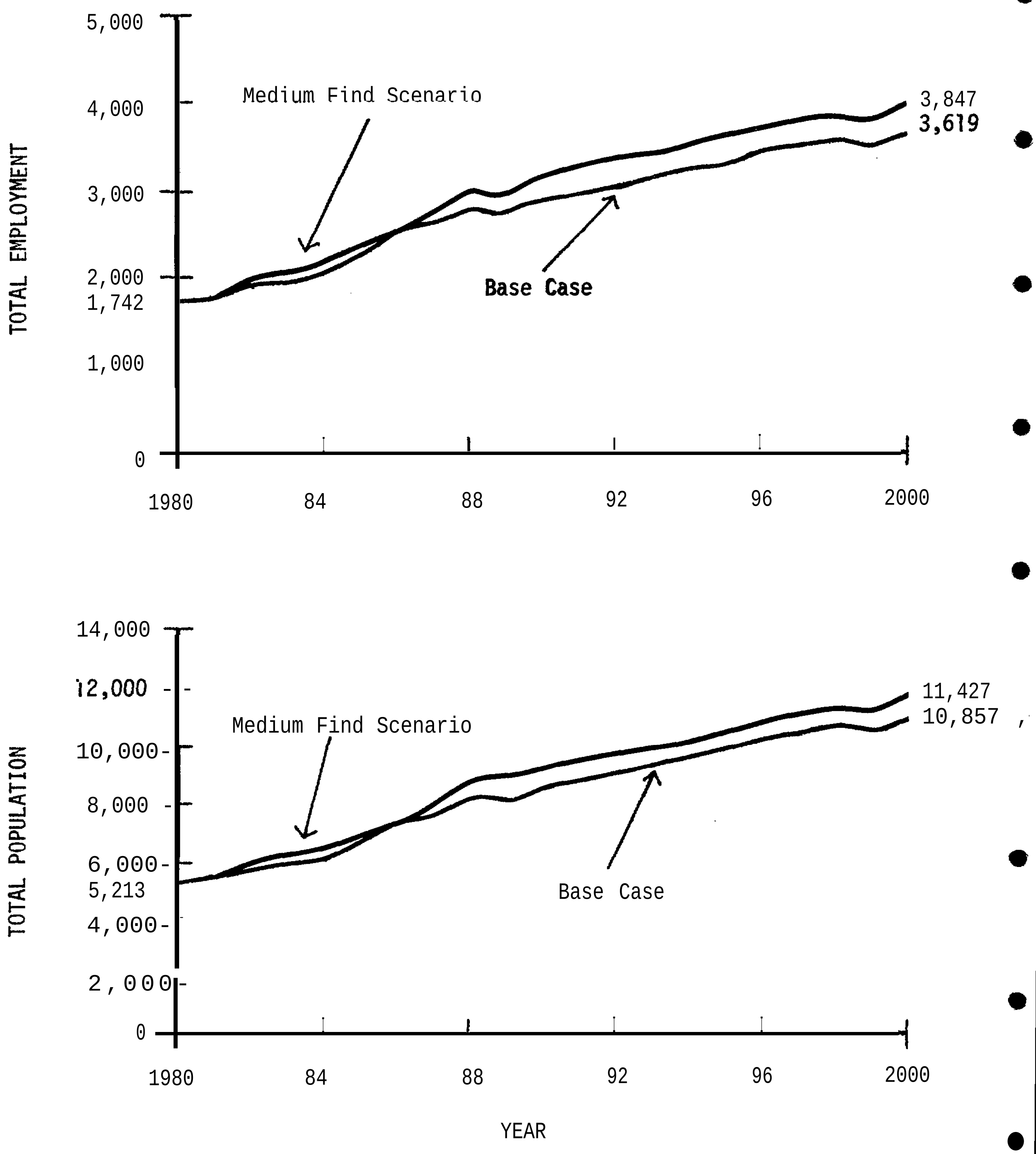
Homer experiences some direct onshore growth impacts under the mean scenario due to its role as a forward base for air and marine logistic support for exploration and offshore operations in Lower Cook Inlet and Shelikof Strait. However, direct onshore employment is minor, peaking at 33 jobs during exploration.

Homer is far more affected by the offshore workforce, part of which is assumed to settle in the Homer area, especially during the production phase. Thus, the major impacts at Homer are delayed until the start-up of production. For purposes of calculating indirect employment and total local population impact, a portion of these offshore jobs is assigned to the general Homer area and the derived population is split equally between the City of Homer and its vicinity.

Between 1989 and the close of the forecast period, Sate #60 is estimated to generate from 187 to 303 jobs in the Homer area, about two-thirds of which are in offshore operations. This employment, in turn, supports population growth in the City of Homer ranging from 234 to 379 residents. During the peak year, OCS-related residents account for under 9 percent of Homer's total population and for about 5 percent during most of the

FIGURE 9

Homer Area
Total Employment and Total Population
Base Case and Medium Scenario
Lower Cook Inlet
1980 - 2000



Source: Alaska Consultants, Inc.

TABLE 146

FORECAST OF POPULATION
MEDIUM FIND SCENARIO
LOWER COOK INLET - CITY OF HOMER
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,450	53	38	2,541
1983	2,610	71	53	2,734
1984	2,793	71	53	2,917
1985	3,055	55	25	3,135
1986	3,427	5	0	3,432
1987	3,707	109	31	3,847
1988	4,036	214	20	4,270
1989	4,090	253	16	4,359
1990	4,280	360	19	4,659
1991	4,341	360	19	4,720
1992	4,493	326	19	4,838
1993	4,631	215	19	4,865
1994	4,773	266	19	5,058
1995	4,920	266	19	5,205
1996	5,075	266	19	5,360
1997	5,187	266	19	5,472
1998	5,306	266	19	5,591
1999	5,252	266	19	5,537
2000	5,429	266	19	5,714

Source: Alaska Consultants, Inc.

production phase. Compared to other sources of growth, Sale #60 is responsible for less than 10 percent of the permanent growth forecast to occur in the Homer area during the next two decades. Thus, the overall impact of the mean scenario upon community facilities and services is to add slightly to the substantial growth otherwise anticipated for Homer (see Tables 147 to 156).

TABLE 147

FORECAST OF NET CHANGE IN HOUSING DEMAND
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	251	76	46	6	24
1983	193	58	35	5	18
1984	183	55	33	4	18
1985	218	66	40	5	21
1986	297		54	7	29
1987	415	1x	76	10	40
1988	423	128	77	10	41
1989	89	27	16	2	9
1990	300	91	55	7	29
1991		18	11	1	6
1992	1:;	36	22	3	11
1993		8	5	1	2
1994	1:;	58	35	5	18
1995	147	45	27	4	14
1996	155	47	28	4	15
1997	112	34	20	3	11
1998	119	36	22	3	11
1999	-54	-16	-10	-1	-5
2000	177	54	33	4	17
TOTAL,	3,424	1,037	625	83	329

Source: Alaska Consultants, Inc.

TABLE 148

ESTIMATED DEMAND FOR RESIDENTIAL LAND
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	154	27.7	10.8	38.5
Multifamily & Trailer	101	9.1	3.5	12.6
1986-90				
Single Family	278	50.0	19.5	69.5
Multifamily & Trailer	184	16.6	6.4	23.0
1991-95				
Single Family	100	18.0	7.0	25.0
Multifamily & Trailer	65	5.8	2.3	8.1
1996-2000				
Single Family	93	16.7	6.5	23.2
Multifamily & Trailer	62	5.6	2.2	7.8
TOTAL	1,037	149.5	58.2	207.7

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 149

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Industrial Capacity	Total Capacity
1982	316	652	968
1983	340	711	1,051
1984	363	735	1,098
1985	390	794	1,184
1986	429	876	1,305
1987	478	994	1,472
1988	528	1,111	1,639
1989	539	1,086	1,625
1990	573	1,108	1,681
1991	581	1,122	1,703
1992	597	1,150	1,747
1993	603	1,156	1,759
1994	626	1,202	1,828
1995	644	1,237	1,881
1996	663	1,274	1,937
1997	677	1,300	1,977
1998	692	1,328	2,020
1999	685	1,314	1,999
2000	708	1,356	2,064

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 150

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 -2000

Year	Daily Treatment Capacity 1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	319	39*9
1983	344	43.0
1984	367	45.9
1985	390	49.0
1986	429	53.6
1987	481	60.1
1988	530	66.2
1989	541	67.6
1990	574	71.8
1991	582	72.8
1992	598	74.8
1993	604	75.5
1994	627	78.4
1995	645	80.6
1996	664	83.0
1997	678	84.8
1998	693	86.6
1999	686	85.8
2000	709	88.6

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 151

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
MEDIUM FIND SCENARIO
HOMER AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,254
1983	10,992
1984	11,658
1985	12,700
1986	13,802
1987	15,133
1988	16,078
1989	16,403
1990	17,546
1991	17,775
1992	18,217
1993	18,319
1994	19,042
1995	19,594
1996	20,175
1997	20,585
1998	21,026
1999	20,794
2000	21,458

Source: Alaska Consultants, Inc.

TABLE 152

ESTIMATED DISPOSABLE SOLID WASTES
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,563	15,252
1983	2,864	16,777
1984	3,085	18,256
1985	3,423	20,464
1986	3,767	22,551
1987	4,186	24,984
1988	4,593	27,739
1989	4,729	28,562
1990	5,074	30,748
1991	5,140	31,148
1992	5,269	31,930
1993	5,298	32,106
1994	5,508	33,378
1995	5,668	34,348
1996	5,837	35,372
1997	5,959	36,112
1998	6,089	36,899
1999	6,030	36,542
2000	6,222	37,705

a/ Multiply by .9070294 to obtain metric torts.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 153

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	770	993	105
1983	828	1,076	83
1984	883	1,157	81
1985	949	1,253	
1986	1,039	1,382	1 x
1987	1,165	1,561	1 79
1988	1,293	1,746	185
1989	1,320	1,795	49
1990	1,411	1,933	138
1991	1,429	1,972	39
1992	1,465	2,036	64
1993	1,473	2,062	26
1994	1,531	2,143	81
1995	1,576	2,206	63
1996	1,623	2,272	66
1997	1,657	2,320	48
1998	1,693	2,370	50
1999	1,677	2,348	-22
2000	1,731	2,423	75

Source: Alaska Consultants, Inc.

TABLE 154

SCHOOL ENROLLMENT FORECAST
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	305	203	508
1983	328	219	547
1984	350	233	583
1985	376	251	627
1986	412	274	686
1987	461	308	769
1988	512	342	854
1989	523	349	872
1990	559	373	932
1991	566	378	944
1992	581	387	968
1993	584	389	973
1994	607	405	1,012
1995	625	416	1,041
1996	643	429	1,072
1997	656	438	1,094
1998	709	473	1,182
1999	664	443	1,107
2000	686	457	1,143

Source: Alaska Consultants, Inc.

TABLE 155

GENERAL FUND
REVENUE FORECAST
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
982	$ 619	$ N/A	$ 407	$ 98	$1,124
983	667	N/A	438	105	1,210
984	711	N/A	467	112	1,290
1985	764	N/A	502	120	1,386
1986	837	N/A	550	132	1,519
1987	938	N/A	616	148	1,702
1988	1,041	N/A	684	164	1,889
1989	1,063	N/A	698	168	1,929
1990	1,136	N/A	746	179	2,061
1991	1,151	N/A	756	181	2,088
1992	1,179	N/A	775	186	2,140
1993	1,186	N/A	779	187	2,152
1994	1,233	N/A	810	194	2,237
1995	1,269	N/A	834	200	2,303
1996	1,307	N/A	859	206	2,372
1997	1,334	N/A	877	210	2,421
1998	1,363	N/A	896	215	2,474
1999	1,350	N/A	887	213	2,450
2000	1,393	N/A	915	220	2,528

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 156

FORECAST OF REVENUES AND OPERATING EXPENDITURES
MEDIUM FIND SCENARIO
CITY OF HOMER
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,124	$1,011	$ 113
1983	1,210	1,087	123
1984	1,290	1,160	130
1985	1,386	1,24?	139
1986	1,519	1,365	154
1987	1,702	1,530	172
1988	1,889	1,698	191
1989	1,929	1,734	195
1990	2,061	1,853	208
1991	2,088	1,877	211
1992	2,140	1,924	216
1993	2,152	1,935	217
1994	2,237	2,012	225
1995	2,303	2,070	233
1996	2,372	2,132	24C
1997	2,421	2,176	245
1998	2,474	2,224	250
1999	2,450	2,202	248
2000	2,528	2,273	255

a/ The City of Homer does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

PROJECTIONS OF GROWTH - 5 PERCENT SCENARIO

Introduction

The 5 percent and the other two OCS petroleum scenarios or cases which form the basis of the socioeconomic impact assessment for Kenai, Soldotna and Homer in this study were selected by the U.S. Bureau of Land Management's Alaska OCS Office and developed by Dames and Moore from U.S. Geological Survey resource estimates. Although reasonably precise locations, quantities, methods of operation and time frames are necessary to the development of plausible scenarios, such scenarios and their impacts should not be interpreted as forecasts of what is actually going to happen. There is far too much uncertainty in oil and gas exploration and development for this degree of precision. However, an indication is given of the type and scale of activities which could impact Lower Cook Inlet communities and the extent to which individual communities would logically be impacted.

The high or 5 percent scenario represents a highly successful outcome to Sale #60, corresponding with a level of recoverable oil and gas reserves that has one chance in twenty of being realized according to U.S. Geological Survey estimates. Also, the features of field location and reservoir characteristics are economically very favorable for efficient production. Under this scenario's assumptions, 1.4 billion barrels of crude oil and 1.363 trillion cubic feet of natural gas are discovered and produced from fields in Lower Cook 'Inlet and Shelikof Strait.

Offshore exploration, development and production of the oil and gas reserves discovered under this scenario is a major industrial undertaking, stretching over decades, involving a great commitment of capital, labor and material resources. However, the same scenario features that permit efficient, economical development and production also structure the enterprise in a way that results in little new industrial development onshore and, generally, in relatively limited onshore impacts upon Kenai Peninsula communities for the assumed level of oil and gas production.

Sale #60 is scheduled to take place a few years after Sale CI and near an established oil and gas region experiencing declining production and excess capacity. As a result, the offshore industry is largely able to use existing onshore support and product handling facilities developed previously for older oil and gas fields and for OCS Sale CI.

Under the 5 percent scenario, exploration and development interest concentrates on two offshore areas, Lower Cook Inlet and Shelikof Strait. Exploration activities begin in the year following the sale and extend over a five year period. Exploration support is supplied through existing marine facilities at Nikiski and an advance base established at Homer, with air service support also being provided via Homer. Over the exploration period, a total of 57 exploration and delineation wells are drilled, with effort about evenly divided between the Lower Cook Inlet and Shelikof Strait fields.

The first discovery is made in the initial year of exploration and favorable findings continue in succeeding years. Eventually, six producible fields are found, including two giant oil fields (550 and 450 million barrels respectively) and one gas field (1 billion cubic feet) in the Shelikof Strait province and two major oil fields (200 million barrels each) and one gas field (363 billion cubic feet) in Lower Cook Inlet. Total recoverable reserves are estimated at 1.4 billion barrels of oil and 1.363 trillion cubic feet of natural gas, with about three-quarters of the reserves situated in Shelikof Strait.

The development phase begins in the third year after the sale. The process of platform installation and facility construction continues over a six year period. Field characteristics are such that a single platform suffices for each field and six steel platforms, fabricated at West Coast sites, are installed. Associated onshore facility development includes an oil terminal at Afognak Island to handle Shelikof Strait oil production, a service base on Afognak Island to support oil and gas field development and production in the Shelikof Strait province and expanded marine support facilities at Homer and Nikiski to service offshore activities in Lower Cook Inlet. As oil production in Lower Cook Inlet is transported by submarine and overland pipeline to the existing terminal at Drift River on the west shore of Cook Inlet, new onshore construction for that purpose is limited to pipeline construction and, possibly, some oil treatment facilities.

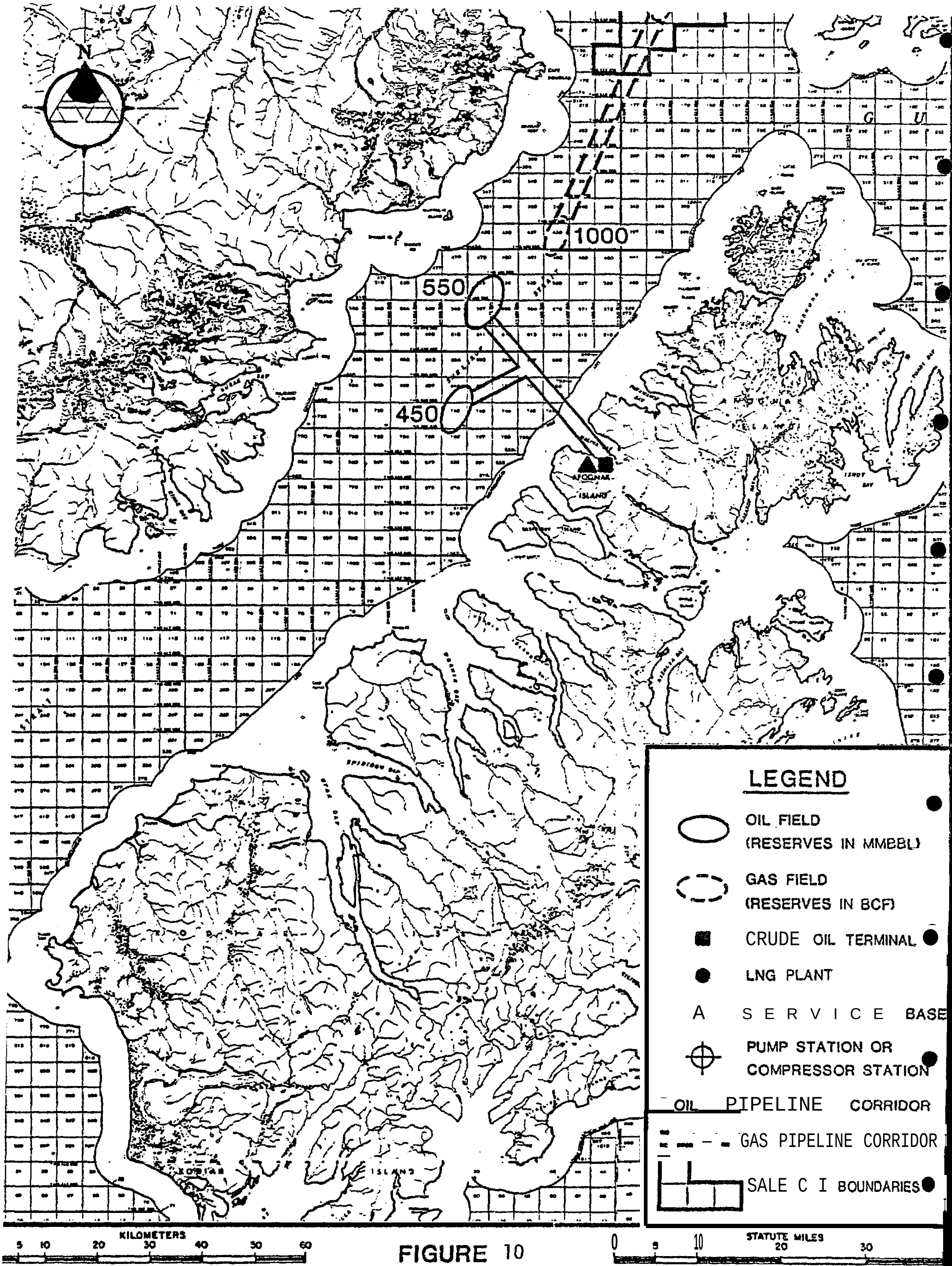
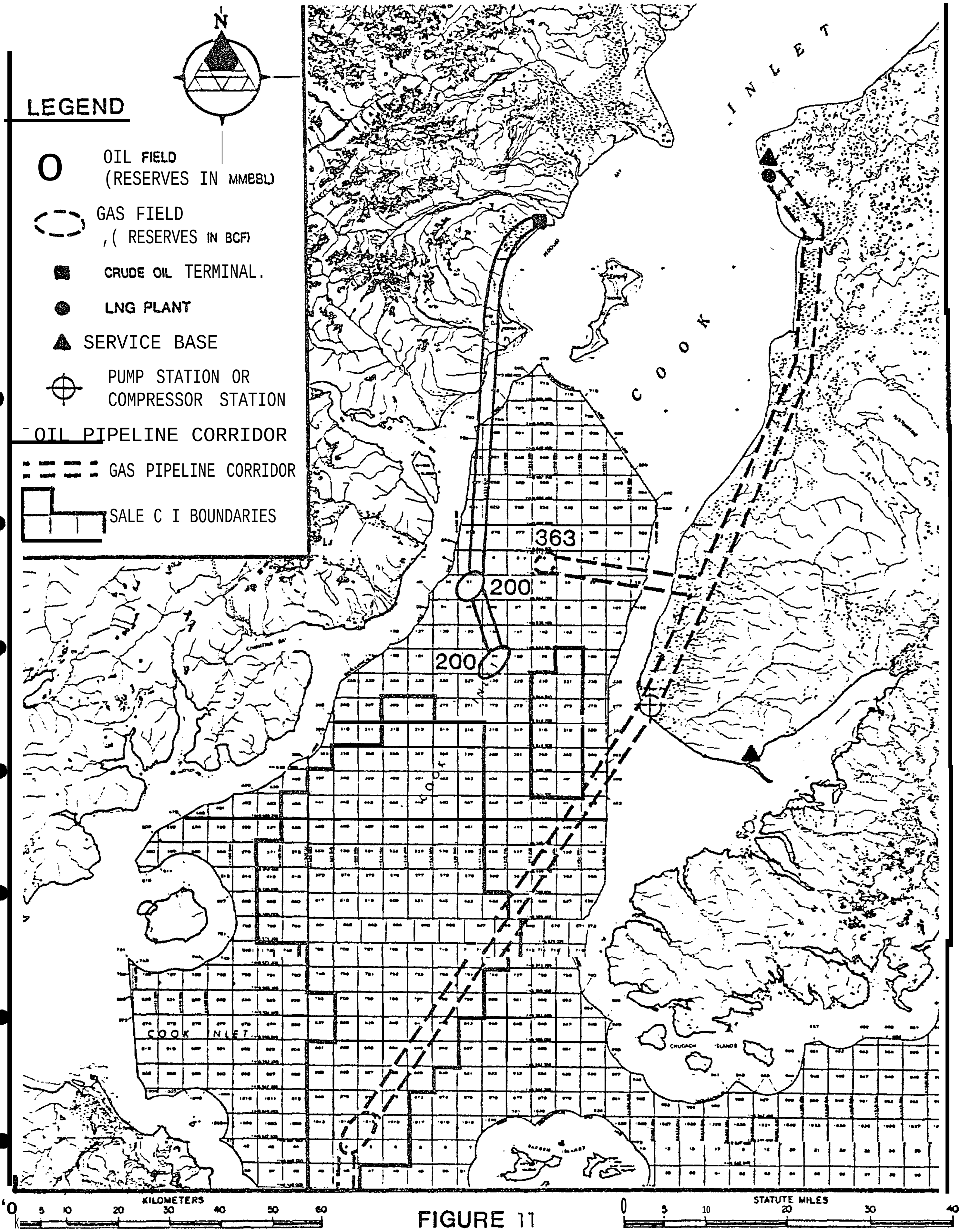


FIGURE 10

OURCE: DAMES & MOORE

SHELIKOF STRAIT
HIGH FIND SCENARIO
FIELD AND SHORE FACILITY LOCATIONS



SOURCE: DAMES & MOORE

FIGURE 11

LOWER COOK INLET
HIGH FIND SCENARIO

The gas fields in Shelikof Strait and Lower Cook In"let are similarly located close to producing fields previously leased. This circumstance makes it economically feasible to deliver new gas production to established submarine and overland trunk pipelines and gas processing facilities, once the connecting submarine pipeline links are installed.

While field development activities persist through 1994, oil production is assumed to begin as early as 1989 and gas production by 1990. Oil and gas production peaks within two to five years after startup and then begins to decline. Gas production from both the Shelikof and Cook Inlet fields concludes before the end of the forecast period, but oil production lasts through the first few years beyond the end of the scenario.

REGIONAL ECONOMIC FORECASTS - 5 PERCENT SCENARIO

Significant Factors Affecting Growth

Because of the 5 percent scenario's assumed geographic distribution of development activities, particularly the diversion of most oil production to a remote terminal on Afognak Island, Sale #60's high scenario has relatively minor direct onshore impact upon the Kenai Peninsula communities, despite the high level of oil and gas production assumed.

This scenario assumes major OCS oil and gas discoveries and production. As has been the case with previous Cook Inlet oil and gas operations, this scenario also assumes that the Kenai-Soldotna-Ni kiski communities

TABLE 157

ASSUMPTIONS FOR THE DISTRIBUTION OF EMPLOYMENT
AMONG THE COASTAL AREAS OF KENAI, HOMER AND AFOGNAK ISLAND
5 PERCENT PROBABILITY RESOURCE LEVEL SCENARIO
LOWER COOK INLET

Phase, Task and Area of Operations	Kenai	Homer	Afognak Island
EXPLORATION			
<u>Survey</u>			
Offshore			
Geophysical and Geological Surveying [area of operation]	Not Applicable	Survey vessels conducting geophysical and geological surveys in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Survey vessels conducting geophysical and geological surveys in Shelikof Strait outside the Kenai-Cook Inlet coastal area.
Onshore			
Service Base	Not Applicable	Temporary (advance) service base providing resupply and communications for vessels surveying in Lower Cook Inlet and Shelikof Strait.	Not Applicable
<u>Rigs</u>			
Offshore			
Exploration Well Drilling [area of operation]	Not Applicable	Rigs drilling exploration wells in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Rigs drilling exploration wells in Shelikof Strait outside the Kenai-Cook Inlet coastal area.

Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Supply/anchor/tug boats transporting materials to rigs, moving rig anchors and towing rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Onshore Service Base	Existing permanent shore base supplying rigs and boats in Lower Cook Inlet and Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo.	Advance shore base supplying rigs and boats in Lower Cook Inlet and Shelikof Strait with fuel, water, mud, cement, food and other cargo.	Not Applicable
Air Transportation	Not Applicable	Helicopter service from Homer Airport transporting offshore personnel and small volume, light weight freight to and from rigs in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Construction	Not Applicable	Not Applicable	Constructing a permanent service base on Afognak Island.
DEVELOPMENT			
<u>Platform Installation and Offshore Pipeline Construction</u>			
Offshore Platform Installation [area of operation]	Not Applicable	Locating, installing and commissioning platforms in Lower Cook Inlet outside the Kenai-Cook Inlet coastal area.	Locating, installing and commissioning platforms in Shelikof Strait outside the Kenai-Cook Inlet coastal area.

Pipeline Construction [area of operations]	Not Applicable	Laying and burying subsea oil gathering and trunk line to the western shore of Cook Inlet (Drift River) and a subsea gas trunk line to the to the eastern shore to connect to an existing onshore line near Happy Valley.	Laying and burying subsea gathering and trunk line to the western shore of Afognak Island and a subsea gas trunk pipeline to an existing Lower Cook Inlet subsea gas line.
Marine Transportation [port area]	Supply/anchor/tug boats transporting materials to platforms, lay barges and bury barges. Two-thirds of the effort in platform installation and pipe-laying and burying in Lower Cook Inlet Inlet will be provided from the Kenai area.	Supply/anchor/tug boats transporting materials to platforms, lay barges and and bury barges. One-third of the effort in platform installation and pipe laying and burying in Lower Cook Inlet will be provided from Homer.	Supply/anchor/tug boats transporting materials to platforms, lay barges, and bury barges. All of the vessels for the Shelikof Strait platform installation and pipe laying and burying will be provided from Afognak Island.
Onshore Service Base	Shore base supplying boats, platforms, lay barges and bury barges with tubular materials, fuel, water, food and other cargo. Two-thirds of the total effort for platform installation and pipeline construction in Lower Cook Inlet will be provided from the Kenai Area.	Shore base supplying boats, platforms, lay barges with fuel, water, food and other cargo. One-third of the total effort for platform installation and pipeline construction in Lower Cook Inlet will be provided from Homer.	Shore base supplying boats, platforms, lay barges and bury barges with tubular materials, fuel, water, food and other cargo. The total effort for platform installation and pipeline construction in Shelikof Strait will be provided from Afognak Island.

Air Transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, lightweight freight to platforms, lay barges and bury barges in Lower Cook Inlet and Shelikof Strait.	Not Applicable
Construction	Coating of all pipe used in subsea gathering and trunk pipelines in the Kenai area.	Constructing onshore pipelines on oil pipeline to to the Drift River terminal and a gas pipeline to an existing onshore line thence to Nikiski.	Constructing onshore pipeline and oil terminal on Afognak Island.
<u>Platforms</u>			
Offshore			
Development Drilling [area of operation]	Not Applicable	Development drilling on platforms in Lower Cook inlet outside the Kenai-Cook Inlet coastal area.	Development drilling on platforms in Shelikof Strait outside the Kenai-Cook Inlet coastal area.
Marine Transportation [port area]	Supply boats transporting materials to platforms in Lower Cook Inlet.	Supply boats transporting materials to platforms in Lower Cook Inlet.	Supply boats transporting materials to platforms in Shelikof Strait.
Onshore			
Service Base	Shore base supplying boats and platforms in Lower Cook Inlet with tubular materials, food, water, mud, cement, food and other cargo. Two-thirds of the effort in this area provided from the Kenai area.	Shore base supplying boats and platforms in Lower Cook Inlet with fuel, water, mud, cement, food and other cargo. One-third of the effort in this area provided from Homer.	Shore base supply boats and platforms in Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo.

Air transportation	Not Applicable	Helicopter service at Homer Airport transporting offshore personnel and small volume, light weight freight to platforms in Lower Cook Inlet and Shelikof Strait.	Not Applicable
PRODUCTION			
<u>Platforms</u>			
Offshore			
Platform Operations [area of operation]	Not Applicable	Operating platforms with periodic workovers and well stimulation in Lower Cook Inlet.	Operating platforms with workovers and well stimulation in Shelikof Strait.
Marine Transportation [port area]	Supply boats transporting materials to platforms in Lower Cook Inlet. All of this effort will be provided from the Kenai area.	Not Applicable	Supply boats transporting materials to platforms in Shelikof Strait.
Onshore			
Service Base	Shore base providing all of the effort in supplying boats and platforms in the Lower Cook Inlet with tubular materials, fuel, water, mud, cement, food and other cargo.	Not Applicable	Shore base on Afognak Island supplying boats and platforms in Shelikof Strait with tubular materials, fuel, water, mud, cement, food and other cargo. Afognak Island service base employee assumed to be rotated throug Homer.

Oil Terminal and LNG Plant Operations	The use of existing facilities in the **Nikiski** area is assumed.	Not Applicable	Operating oil terminal storing and shipping oil from the **Shelikof Strait** fields. Afognak Island oil terminal employees assumed to be rotated through Homer.

Source: Alaska Consultants, Inc. Derived from fac lity and **OCS** employment scenarios prepared by Dames and Moore.

will be the local settlements most directly involved in provision of various support services to the oil industry. Nevertheless, because of the geography of new resource finds and the timing of development activities, the scenario forecast projects relatively modest direct onshore impacts upon the Central Peninsula area in relation to the anticipated scale of production.

The major oil and gas finds are located in Shelikof Strait near Afognak Island and, as a result, related field development and operations support are diverted to new remote facilities built on Afognak. Also, all oil production from the Shelikof fields is routed to a new oil terminal on Afognak. Those Sale #60 activities which rely upon the Central Peninsula area for industrial support mostly take up slack in existing industrial facilities that would otherwise be phased out or underused. No major new onshore facilities or construction employment result from Sale #60.

Thus, few new onshore jobs are created in petroleum-related enterprises and what growth occurs is layered on top of a solid base of existing petroleum development. Numerically more significant is the impact of the offshore workers in the Lower Cook Inlet and Shelikof Strait fields who already live in or opt to resettle in the Central and Southern Peninsula areas. On the average in this scenario, there are ten local residents employed at offshore jobs for every resident employed at an onshore job in OCS-related endeavors. The forecast assumes that a substantial share of the offshore platform work force and the Afognak terminal work force will choose to live in the study area once production begins. Thus, while the total number of Kenai-Cook Inlet area employees including resident offshore workers attributable to this scenario is relatively low (about 140 to 240 jobs) through exploration and field development, employment climbs to over 1,500 during the peak production years and then stabilizes at about 1,200 thereafter.

Future Employment

It is a peculiarity of this scenario that the level of offshore and remote employment is a more significant factor in the local economies than direct onshore jobs in OCS-related industries. The of shore work force in the Shelikof Strait and Lower Cook Inlet provinces together with the onshore work force at the remote terminal and serv ce base on Afognak Island exceeds many times over the onshore OCS industrial employment. The scenario assumes that a share of these offshore and remote workers will come from or choose to take up residence within the study area. For purposes of forecasting population impacts, these workers have been tallied in the study area's employment forecast and assigned either to the Kenai-Soldotna or Homer Labor Areas.

Kenai-Soldotna Labor Area. The direct onshore employment generated in the Kenai-Soldotna area by Sale #60 is low, confined mainly to support operations based in the North Kenai-Nikiski area. There is a single-year employment high of 103 direct onshore jobs during the peak of development activity, but otherwise an average of about 40 new OCS-related jobs in the Kenai area.

As previously noted, under this scenario, the offshore workforce in the Shelikof Strait and Lower Cook Inlet provinces, together with the onshore work force at the remote terminal and service base on Afognak Island, exceeds the onshore work force many times over. It is largely the pattern of off-work residency adopted by this offshore work force that influences the local employment and population flows ensuing from the OCS scenario. The Kenai-Soldotna area's share of permanent offshore employment is estimated to stabilize in the approximate range of 350 to 450 workers throughout the production phase of Sale #60 development. When direct onshore OCS employment and indirect employment are considered as well, the total number of jobs assigned to the Kenai-Soldotna area as a result of Sale #60 is maintained at roughly about 100 during the first half-dozen post sale years, then rises abruptly to the range of 550 to 750 jobs with the onset of production. The employment peak is reached about 10 years after the sale, and then gradually declines over the rest of the forecast period.

Homer Labor Area. The period of exploration and field development adds few employees to the Homer area's workforce. A variety of marine and air support activities add perhaps 30 onshore jobs to Homer's employment base. Resident offshore workers and employees in secondary economic sectors outweigh direct local OCS employment. Counting all sources of employment, Sale #60 supports somewhat more than 100 jobs in the Homer area over the first half-dozen years of the scenario.

There is little change anticipated in the number of OCS-related onshore jobs over the forecast period. A very different pattern is expected in the case of locally-resident offshore workers. Their numbers are forecast to rise sharply with the onset of production to an estimated peak of 480 workers around 1990 and to decline slowly over the rest of the production period.

Thus, after a slow start, the high scenario is estimated to support up to 759 direct and indirect employees in the Homer area and an average of about 600 employees over the decade after 1990. It should be noted that less than 40 percent of these employees actually work onshore in the Homer area, while more than 60 percent are residents employed offshore.

e

TABLE 158

FORECAST OF TOTAL EMPLOYMENT FROM 5 PERCENT SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area	Southern Peninsula Area	Total
1982	66	73	139
1983	112	120	232
1984	112	120	232
1985	112	120	232
1986	109	114	223
1987	126	116	242
1988	307	300	607
1989	586	503	1,085
1990	774	744	1,518
1991	784	759	1,543
1992	714	697	1,411
1993	602	595	1,197
1994	604	585	1,189
1995	632	613	1,245
1996	658	639	1,297
1997	658	639	1,297
1998	609	602	1,211
1999	572	569	1,411
2000	546	540	1,086

Source: Alaska Consultants, Inc.

TABLE 159

FORECAST OF TOTAL POPULATION FROM 5 PERCENT SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Central Peninsula Area			Southern Peninsula Area		Total
	City of Kenai	City of Soldotna	Remaining Area	City of Homer	Remaining Area	
1982	45	39	81	92	91	348
1983	75	65	140	151	149	580
1984	75	65	140	151	149	580
1985	75	65	140	151	149	580
1986	73	64	135	143	142	557
1987	83		157	145	145	604
1988	196	1;;	384	376	374	1,517
1989	337	318	713	629	654	2,651
1990	472	460	961	930	930	3,753
1991	498	482	980	949	949	3,858
1992	455	439	891	871	871	3,527
1993	383	370	752	744	743	2,992
1994	386	370	754	731	731	2,972
1995	403	387	790	766	766	3,112
1996	420	404	821	799	798	3,242
1997	420	404	821	799	798	3,242
1998	387	375	760	753	752	3,027
1999	363	353	714	712	711	2,853
2000	346	336	683	675	675	2,715

Source: Alaska Consultants, Inc.

TABLE 160

FORECAST OF POPULATION
HIGH FIND SCENARIO
LOWER COOK INLET - KENAI-COOK INLET CENSUS DIVISION
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	27,270	215	133	27,618
1983	26,851	355	225	27,431
1984	27,368	355	225	27,948
1985	28,588	355	225	29,168
1986	30,157	380	177	30,714
1987	31,120	464	140	31,724
1988	32,385	1,370	147	33,902
1989	32,530	2,245	406	35,181
1990	33,469	3,485	268	37,222
1991	34,084	3,600	258	37,942
1992	35,031	3,260	267	38,558
1993	35,907	2,750	242	38,899
1994	36,837	2,705	267	39,809
1995	37,770	2,845	267	40,882
1996	38,745	2,975	267	41,987
1997	39,554	2,975	267	42,796
1998	40,399	2,815	212	43,426
1999	40,524	2,658	195	43,377
2000	41,607	2,525	190	44,322

Source: Alaska Consultants, Inc.

TABLE 161

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
HIGH FIND SCENARIO
LOWER COOK INLET - KENAI AREA
1982 - 2000

Year	Survey	Rigs	Platforms		Supply/Anchor/Tug Boats			Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
			Development Drilling	Operations	Exploration	Development	Production			
1982					52					52
1983					87					87
1984					87					87
1985					87					87
1 986					69					69
1987						31				31
1988						31				31
1989						43	6			49
990						3	24			27
991							36			36
992							36			36
993							36			36
994							36			36
995							36			36
996							36			36
997							36			36
998							30			30
1 999							24			24
2000							24			24

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 162

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT 1/
HIGH FIND SCENARIO
LOWER COOK INLET - CENTRAL PENINSULA AREA (KENAI)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1982	29	15	44	110
1983	48	24	72	180
1984	48	24	72	180
1985	48	24	72	180
1986	51	25	76	190
1987	62	31	93	232
1988	183		274	685
1989	300	1;:	450	1,125
1990	465	233	698	1,745
1991	480	240	720	1,800
1992	435	217	652	1,630
1993	367	183	550	1,375
1994	361	181	542	1,355
1995	380	190	570	1,425
1996	397	199	596	1,490
1997	397	199	596	1,490
1998	376	188	564	1,410
1999	355	177	532	1,330
2000	337	169	506	1,265

1/ OCS offshore development includes the OCS onshore development outside the Kenai-Cook Inlet coastal area such as the OCS onshore development on Afognak Island.

Source: Alaska Consultants, Inc.

TABLE 163

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
HIGH FIND SCENARIO
LOWER COOK INLET - KENAI AREA
1982 - 2000

Year	Service Base	Helicopter Service: Exploration	Helicopter Service: Development	Helicopter Service: Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1982	15											15
1983	27											27
1984	27											27
1985	27											27
1986	22											22
1987	22											22
1988	22											22
1989	45								58			103
1990	30								28			58
1991	43											43
1992	41											41
1993	35											35
1994	41											41
1995	41											41
1996	41											41
1997	41											41
1998	30											30
1999	27											27
2000	27											27

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 164

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
HIGH FIND SCENARIO
LOWER COOK INLET - CENTRAL PENINSULA AREA (KENAI)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	15	7	22		22	55	55
1983	27	13	40		40	100	100
1984	27	13	40		40	100	100
1985	27	13	40		40	100	100
1986	22	11	33		33	82	82
1987	22	11	33		33	82	82
1988	22	11	33		33	82	82
1989	103	29	132	58	74	185	243
1990	58	18	76	28	48	120	148
1991	43	21	64		64	160	160
1992	41	21	62		62	155	155
1993	35	17	52		52	130	130
1994	41	21	62		62	155	155
1995	41	21	62		62	155	155
1996	41	21	62		62	155	155
1997	41	21	62		62	155	155
1998	30	15	45		45	112	112
1999	27	13	40		40	100	100
2000	27	13	40		40	100	100

Source: Alaska Consultants, Inc.

TABLE 165

ESTIMATED OFFSHORE ONSITE EMPLOYMENT BY TASK
HIGH FIND SCENARIO
LOWER COOK INLET - HOMER AREA
1982 - 2000

Year	Survey	Rigs	Platforms: Development Drilling	Platforms: Operations	Supply/Anchor/Tug Boats: Exploration	Supply/Anchor/Tug Boats: Development	Supply/Anchor/Tug Boats: Production	Platform Installation	Offshore Pipeline Construction	Total Employment Offshore Onsite
1982	17	56			26					99
1983	62	112			43					184
1984	25	112			43					180
1985	62	112			43					181
1986	61	112			35					166
1987						15		146		161
1988			112			15		146		273
1989			224	33		22		146	72	497
1990			280	94		2			25	401
1991			243	132						375
1992			112	151						263
1993				149						149
1994				166						166
1995				181						181
1996				181						181
1997				181						181
1998				156						156
1999				131						131
2000				131						131

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 166

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS OFFSHORE DEVELOPMENT 1/
HIGH FIND SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Total Population
1982	28	14	42	105
1983	47	23	70	175
1984	47	23	70	175
1985	47	23	70	175
1986	51	25	76	190
1987	62	31	93	232
1988	183		274	685
1989	299	1;;	448	1,120
1990	464	232	696	1,740
1991	480	240	720	1,800
1992	435	217	652	1,630
1993	367	183	550	1,375
1994	360	180	540	1,350
1995	379	189	568	1,420
1996	396	198	594	1,485
1997	396	198	594	1,485
1998	375	187	562	1,405
1999	354	177	531	1,328
2000	336	168	504	1,260

1/ OCS offshore development includes the OCS onshore development outside of the Kenai-Cook Inlet coastal area such as the OCS onshore development on Afognak Island.

Source: Alaska Consultants, Inc.

TABLE 167

ESTIMATED DIRECT ONSHORE ONSITE EMPLOYMENT BY TASK
HIGH FIND SCENARIO
LOWER COOK INLET HOMER AREA
1982 - 2000

Year	Service Base	Helicopter Service Exploration	Helicopter Service Development	Helicopter Service Production	Service Base Construction	Onshore Pipeline Construction	Oil Terminal Construction	LNG Plant Construction	Pipe Coating	Oil Terminal Operations	LNG Plant Operations	Total Onshore Onsite
1982	10	15										25
1983	15	25										40
1984	15	25										40
1985	15	25										60
1986	11	20										31
1987	11		6									17
1988	11		8									19
1989	23		10	4		25						62
1990	15		12	8								35
1991				26								26
1992				30								30
1993				30								30
1994				30								30
1995				30								30
1996				30								30
1997				30								30
1998				27								27
1999				25								25
2000				24								24

Source: Dames and Moore/Alaska Consultants, Inc.

TABLE 168

ESTIMATED EMPLOYMENT AND POPULATION FROM OCS ONSHORE DEVELOPMENT
HIGH FIND SCENARIO
LOWER COOK INLET - SOUTHERN PENINSULA AREA (HOMER)
1982 - 2000

Year	Direct Employment	Indirect Employment	Total Employment	Onshore-Onsite Construction Employment/Population	Permanent Employment	Permanent Population	Total Population
1982	25	6	31		31		78
1983	40	10	50		50	1;;	125
1984	40	10	50		50	125	125
1985	40	10	50		50	125	125
1986	31	7	38		38	95	95
1987	17	6	23		23	58	58
1988	19	7	26		26	65	65
1989	62	18	80	25	55	138	163
1990	35	13	48		48	120	120
1991	26	13	39		39	98	98
1992	30	15	45		45	112	112
1993	30	15	45		45	112	112
1994	30	15	45		45	112	112
1995	30	15	45		45	112	112
1996	30	15	45		45	112	112
1997	30	15	45		45	112	112
1998	27	13	40		40	100	100
1999	25	13	38		38	95	95
2000	24	12	36		36	90	90

Source: Alaska Consultants, Inc.

Kenai

COMMUNITY FORECASTS - HIGH SCENARIO

Future Population

Under the base case, Kenai is forecast to grow steadily, increasing at a rate of about 2 percent annually from 4,755 in 1980 to about 7,000 by 2000. The high scenario contributes a relatively small increment -- less than a hundred new residents -- to Kenai's population through the exploration years. As the level of offshore employment rises during field development and production, Kenai draws a significant share of the region's OCS-related population growth. By 1991, this scenario adds an estimated 498 residents to Kenai's population base. In the following decade, the OCS dependent population is expected to decline slowly, falling to about 346 by the close of the forecast period. Over this decade of impact, the Sale #60 high scenario increases the City of Kenai's total population by a factor of 8.5 percent at peak to about 5 percent at the close of the scenario.

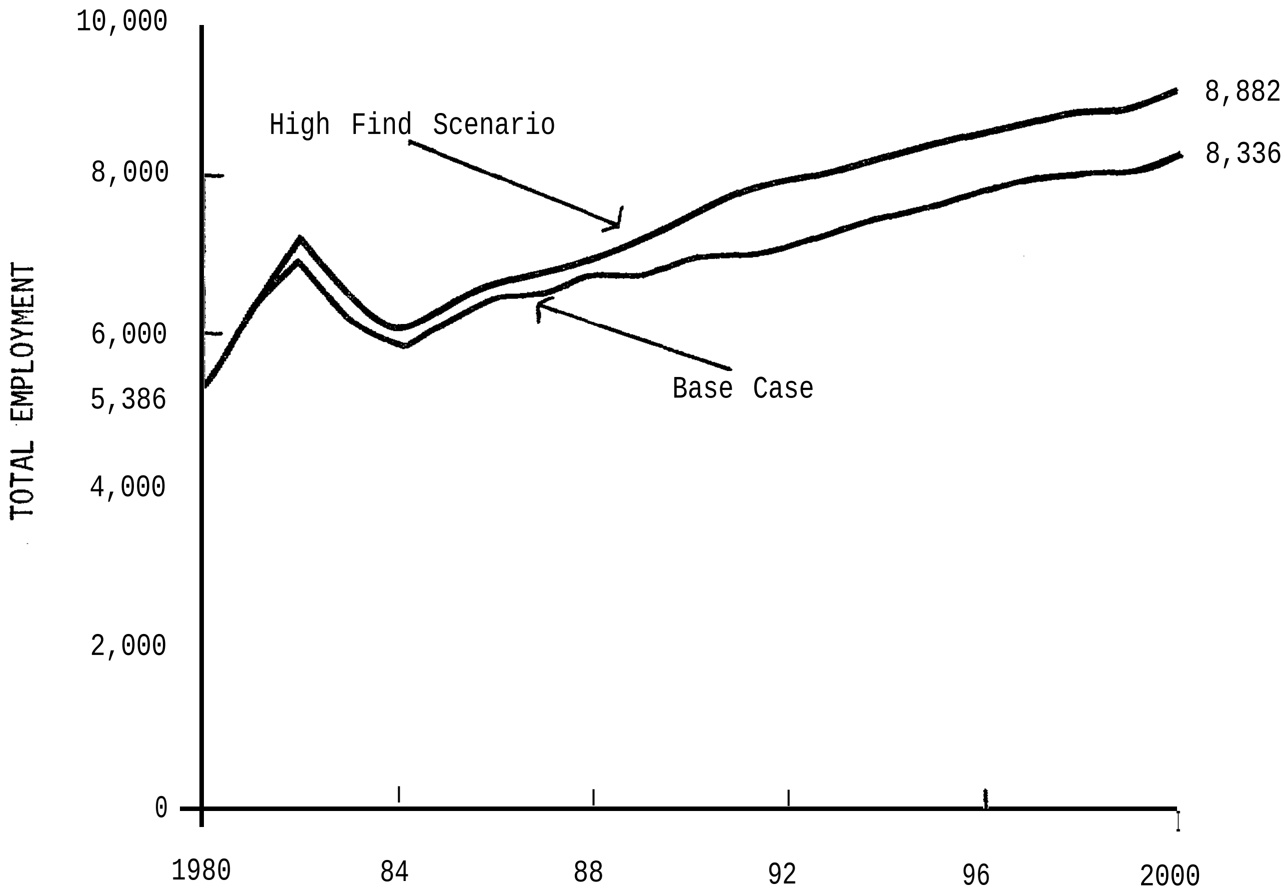
IMPACT ASSESSMENT

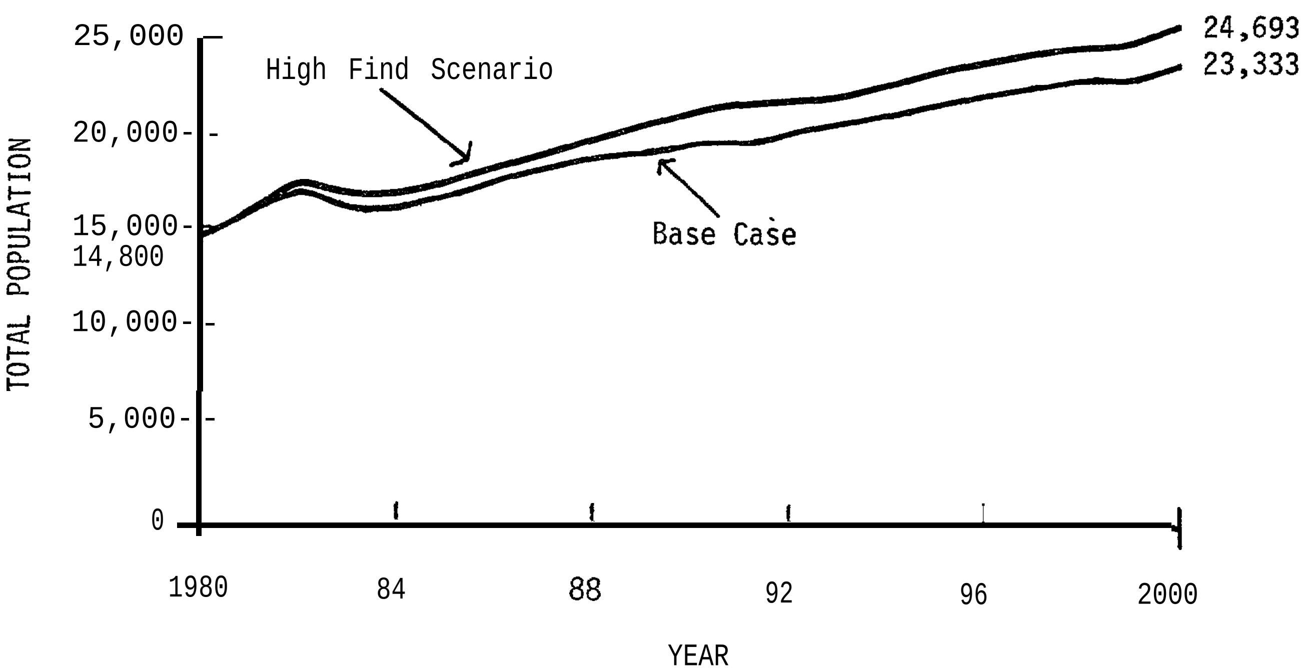
Social Impacts

With the exception of the brief period of accelerated growth in conjunction with development work and production start-up, this scenario does not

FIGURE 12

Kenai - Soldotna Area
Total Employment and Total Population
Base Case and High Find Scenario
Lower Cook Inlet
1980 - 2000





Source: Alaska Consultants, Inc.

TABLE 169

FORECAST OF POPULATION
HIGH FIND SCENARIO
LOWER COOK INLET - CITY OF KENAI
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	4,982	28	17	5,027
1983	5,027	45	30	5,102
1984	5,116	45	30	5,191
1985	5,268	45	30	5,343
1986	5,407	48	25	5,480
1987	5,560	58	25	5,643
1988	5,662	171	25	5,858
1989	5,694	281	56	6,031
1990	5,734	436	36	6,206
1991	5,838	450	48	6,336
1992	5,980	408	47	6,435
1993	6,115	344	39	6,498
1994	6,259	339	47	6,645
1995	6,401	356	47	6,804
1996	6,552	373	47	6,972
1997	6,668	373	47	7,088
1998	6,800	353	34	7,187
1999	6,830	333	18	7,181
2000	7,000	316	18	7,334

Source: Alaska Consultants, Inc.

appear to portend any notable social impacts for Kenai. Overall, growth under this scenario is at a lesser rate than the City has experienced in recent years. The City's infrastructure has generally attained a threshold of development that should enable it, with relatively easy adjustments, to absorb the scenario's added population. Furthermore, the type of economic growth projected under the base case, together with the scenario's increment, appears likely to Fit well into the area's existing pattern of industry. In sum, there do not seem to be any noteworthy long-term social impacts upon Kenai that can be attributed to this scenario.

Impacts on Community Infrastructure

Housing and Residential Land. Under the high scenario, the City of Kenai may need about 103 additional dwelling units or about one-sixth more than estimated to be needed to satisfy base case demand (see Table 170). Almost all this demand is expected to be felt prior to 1992 although there is a small increase in demand from 1994 to 1996. In the last three years of the forecast period there is excess housing capacity. An estimated 8 hectares (20 acres) will be demanded for residential development under the high scenario (see Table 171). According to a recent land inventory study, the supply of land at Kenai is adequate for this level of development.

Utilities

- Water. Aside from incremental extensions to meet the requirements of new residential and commercial development, Kenai's water distribution system should be adequate for the growth anticipated under the high scenario. The 4 percent growth in water consumption envisioned for Kenai should not in itself burden the existing water supply. However, the groundwater which supplies Kenai also serves the entire Central Peninsula area and there is some question as to its ability to sustain major growth in the region. Development of an alternative water source for the Kenai-North Kenai-Soldotna area is under study. The most likely alternative, the Kenai River in the vicinity of Soldotna, would require construction of a pipeline to transport water to Kenai (see Table 172).

- Sewer. The high scenario forecast is not significantly different from the base case forecast (see Table 173).

- Electric Power. Assuming that natural gas remains available for the production of electric power in the Central Peninsula area and that the Bradley Lake hydro-electric facility is constructed as planned in the mid-1980's, the Homer Electric Association will have sufficient electric power available to accommodate growth anticipated in the high scenario (see Table 174).

- Solid Waste Disposal. Disposable solid wastes estimated to be produced by Kenai under the high scenario will consume about 2 hectares (5 acres) more landfill than solid wastes generated in the base case (see Table 175). There is sufficient Borough land in the area to meet this demand.

- Communications. The high scenario forecast is not appreciably different from the base case forecast (see Table 176).

Public Safety

- Police. Kenai is not expected to need any additional police officers or jail cells beyond those called for in the base case to maintain standard levels of police service. However, if the Kenai jail continues to also serve the jail needs of both the City of Soldotna and the Alaska State Troopers, an additional three cells will be demanded to accommodate population growth in the Kenai-North Kenai-Soldotna area forecast under the high scenario.

- Fire Protection. The improvements in firefighting facilities and services estimated to be needed to serve base case growth should be adequate to cover the added fire protection requirements of the high scenario.

Health and Social Services. The health and social service facilities to be provided for the base case should suffice for growth anticipated during the high scenario.

Education. The high scenario's enrollment growth adds a demand for two elementary and two secondary classrooms in Kenai (see Table 177). Existing school facilities can absorb this level of growth.

Recreation. The scale of growth stemming from the high scenario would not add to the demand for recreational facilities in Kenai.

Local Government Finances. In general, the method used to forecast local government revenues and expenditures assumes that localities will maintain about the same level of public services and the same revenue structure as prevailed on a per capita ratio in the baseline year (see Tables 178 and 179). In specific cases where major taxable onshore OCS facilities are programmed, the local real property tax base and revenue forecast may be adjusted to take account of the major increases in revenue which these capital-intensive properties may yield at prevailing mill rates.

However, in the Sale #60 scenarios, no new major onshore industrial facilities are anticipated in the Central Peninsula area. Such existing facilities as are used are mostly located in the unincorporated North Kenai-Nikiski area. As a result, as Kenai's population grows, the City may become relatively more dependent upon its already strained residential and commercial property tax base to support additional services.

Even under the base case conditions, it was noted that the City of Kenai might be pressed to finance future capital improvements. In view of the tax base and service area population trends noted above for OCS-related development at Kenai, it impossible that the City's fiscal situation may worsen under the high scenario.

CAUSE/EFFECT OF IMPACTS

Under the high scenario, the petroleum industry is not expected to make its presence felt in Kenai in the form of local jobs or physical plants. Nevertheless, the industry adds a boost to Kenai's steady upward growth trend in the early and middle period of the scenario. The community impacts accrue largely from Kenai's function as the home community for a share of the permanent offshore work force. The addition of these workers and their families and payrolls stimulate, in turn, secondary economic and population growth.

Thus, the thrust of this scenario tends to promote growth in local income, population and residential settlement without a corresponding increase in local jobs and basic economic development or employment facilities.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

The high scenario is estimated to add up to 498 new residents to Kenai's population at the time of peak impact. This growth accumulates over a number of years and it is estimated that no more than 141 new residents are added due to Sale #60 in any single year. As a result, in comparison to the existing population base and growth trend, the high scenario does not materially alter the type and scale of community facilities and services that would otherwise be in demand. Those elements of the community infrastructure most likely to be at all affected are utility and service systems closely related to new residential development such as water supply and waste treatment, fire protection and neighborhood recreational facilities.

SUMMARY OF IMPACTS

The high scenario speeds the pace of population growth in Kenai over a few years, adding at most a total of nearly 500 new residents. The physical impact of the scenario on Kenai is minimized by the fact that no OCS-related industrial facilities are located in Kenai. In viewof the City of Kenai's history of growth in recent decades, its current economic structure, and the decelerating economic and population growth forecast under the base case, the impact of the high scenario seems compatible with past and future trends and contributes only modestly to the town's public facility and services requirements.

TABLE 170

FORECAST OF NET CHANGE IN HOUSING DEMAND
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	115	36	19	12	5
1983	75	24	12	8	4
1984		28	15	9	4
1985	1:;	48	25	16	7
1986	137	43	22	14	7
1987	163	52	27	17	8
1988	215	68	35	23	10
1989	173	55	29	18	8
1990	175	55	29	18	8
1991	130	41	21	14	6
1992	99	31	16	10	5
1993	63	20	10	7	3
1994	147	47	24	16	7
1995	159	50	26	17	7
1996	168	53	28	17	8
1997	116	37	19	12	6
1998	99	31	16	10	5
1999		-2	-1	-1	0
2000	l;:	49	26	16	7
TOTAL	2,422	766	398	253	115

Source: Alaska Consultants, Inc.

TABLE 171

ESTIMATED DEMAND FOR RESIDENTIAL LAND
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	71	12.8	5.0	17.8
Multifamily & Trailer	65	5.9	2.3	8.2
1986-90				
Single Family	142	25.6	9.9	35.5
Multifamily & Trailer	131	11.8	4.6	16.4
1991-95				
Single Family	97	17.5	6.8	24.3
Multifamily & Trailer	92	8.3	3.2	11.5
1996-2000				
Single Family	88	15.8	6.2	22.0
Multifamily & Trailer	80	7.2	2.8	10.0
TOTAL	766	104.9	40.8	145.7

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 172

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	628	226	854
1983	638	230	868
1984	649	234	883
1985	668	241	909
1986	685	247	932
1987	705	254	959
1988	732	264	996
1989	754	272	1,026
1990	775	280	1,056
1991	792	286	1,078
1992	804	290	1,094
1993	812	293	1,105
1994	831	300	1,131
1995	850	306	1,156
1996	872	314	1,186
1997	886	319	1,205
1998	898	324	1,222
1999	899	324	1,223
2000	918	331	1,249

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 173

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	854	106.8
1983	868	108.5
1984	883	110.4
1985	909	113.6
1986	932	116.5
1987	959	119.9
1988	996	124.5
1989	1,026	128.2
1990	1,056	132.0
1991	1,078	134.8
1992	1,094	136.8
1993	1,105	138.1
1994	1,131	141.4
1995	1,156	144.5
1996	1,186	149.2
1997	1,205	150.6
1998	1,222	152.8
1999	1,223	152.9
2000	1,249	156.1

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 174

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
HIGH FIND SCENARIO
KENAI AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	23,470
1983	21,692
1984	30,766
1985	31,585
1986	32,216
1987	32,635
1988	33,268
1989	34,090
1990	34,656
1991	34,410
1992	34,781
1993	35,018
1994	35,569
1995	36,165
1996	36,795
1997	37,230
1998	37,601
1999	36,929
2000	37,502

Source: Alaska Consultants, Inc.

TABLE 175

ESTIMATED DISPOSABLE SOLID WASTES
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	5,609	39,474
1983	5,787	34,302
1984	5,522	32,977
1985	5,917	35,167
1986	6,221	36,765
1987	6,340	37,648
1988	6,671	39,064
1989	7,189	41,758
1990	7,338	42,622
1991	7,501	43,332
1992	7,587	43,953
1993	7,589	44,254
1994	7,763	45,309
1995	7,936	46,357
1996	8,119	47,466
1997	8,181	48,131
1998	8,260	48,610
1999	8,058	48,253
2000	8,225	49,265

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 176

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	1,595	2,058	62
1983	1,619	2,105	47
1984	1,647	2,158	53
1985	1,695	2,237	79
1986	1,738	2,312	75
1987	1,790	2,399	87
1988	1,858	2,508	109
1989	1,913	2,602	94
1990	1,968	2,696	94
1991	2,009	2,772	76
1992	2,040	2,836	64
1993	2,060	2,884	48
1994	2,107	2,950	66
1995	2,157	3,020	70
1996	2,210	3,094	74
1997	2,247	3,146	52
1998	2,278	3,189	43
1999	2,276	3,186	(3)
2000	2,325	3,255	69

Source: Alaska Consultants, Inc.

TABLE 177

SCHOOL ENROLLMENT FORECAST
HIGH FIND SCENARIO
KENAI AREA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	603	402	1,005
1983	612	408	1,020
1984	623	415	1,038
985	641	428	1,069
986	658	438	1,096
987	677	452	1,129
988	703	469	1,172
989	724	482	1,206
990	745	496	1,241
991	760	507	1,267
1992	772	515	1,287
1993	780	520	1,300
1994	797	532	1,329
1995	817	544	1,361
1996	836	558	1,394
1997	851	567	1,418
1998	862	575	1,437
1999	862	574	1,436
2000	880	587	1,467

Source: Alaska Consultants, Inc.

TABLE 178

GENERAL FUND
REVENUE FORECAST
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$1,517	$ 952	$ 846	$ 278	$3,593
1983	1,540	966	858	282	3,646
1984	1,567	983	873	287	3,710
1985	1,613	1,011	899	295	3,818
1986	1,654	1,037	922	303	3,916
1987	1,703	1,068	949	312	4,032
1988	1,768	1,109	986	324	4,187
1989	1,821	1,142	1,015	333	4,311
1990	1,873	1,175	1,044	343	4,435
1991	1,913	1,199	1,066	350	4,528
1992	1,942	1,218	1,083	356	4,599
1993	1,961	1,230	1,093	359	4,643
1994	2,006	1,258	1,118	367	4,749
1995	2,054	1,288	1,145	376	4,863
1996	2,105	1,320	1,173	385	4,983
1997	2,140	1,342	1,193	392	5,067
1998	2,169	1,360	1,209	397	5,135
1999	2,168	1,359	1,208	397	5,132
2000	2,214	1,388	1,234	405	5,241

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 179

FORECAST OF REVENUES AND OPERATING EXPENDITURES
HIGH FIND SCENARIO
CITY OF KENAI
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$3,593	$2,491	$1,102
1983	3,646	2,528	1,118
1984	3,710	2,573	1,137
1985	3,818	2,648	1,170
1986	3,916	2,716	1,200
1987	4,032	2,797	1,235
1988	4,187	2,903	1,284
1989	4,311	2,989	1,322
1990	4,435	3,076	1,359
1991	4,528	3,140	1,388
1992	4,599	3,189	1,410
1993	4,643	3,220	1,423
1994	4,749	3,293	1,456
1995	4,863	3,372	1,491
1996	4,983	3,455	1,528
1997	5,067	3,513	1,554
1998	5,135	3,562	1,573
1999	5,132	3,559	1,573
2000	5,241	3,635	1,606

a/ The City of Kenai does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Soldotna

COMMUNITY FORECASTS - HIGH SCENARIO

Future Population

In terms of absolute numbers of people, this high scenario engenders virtually the same population growth at Soldotna as at Kenai. This is because nearly all of the Central Peninsula region's Sale #60-related growth is tied to the offshore work force rather than local worksites. Soldotna and Kenai were assigned an equal share of offshore workers from Sale #60, although Kenai, because of its closeness to industrial employment sites in North Kenai-Nikiski, attracts as residents a few more onshore workers.

Through 1987, the projection is that Soldotna will accumulate less than 80 additional residents from the high scenario as a result of new offshore exploration activity. However, once the recoverable reserves assumed under the high scenario are confirmed and field development commences, the base population is augmented by about 450 additional residents during the peak years, and only slightly less during the following years. In the peak period, 1990 to 1992, the scenario accounts for about 12 percent of Soldotna's total population (see Table 180).

TABLE 180

FORECAST OF POPULATION
HIGH FIND SCENARIO
LOWER COOK INLET - CITY OF SOLDOTNA
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,821	28	11	2,860
1983	2,839	45	20	2,904
1984	3,021	45	20	3,086
1985	3,123	45	20	3,188
1986	3,369	48	16	3,433
1987	3,479		16	3,553
1988	3,708	1;;	16	3,895
1989	3,697	281	37	4,015
1990	3,875	436	24	4,335
1991	3,935	450	32	4,417
1992	4,031	408	31	4,470
1993	4,122	344	26	4,492
1994	4,218	339	31	4,588
1995	4,313	356	31	4,700
1996	4,413	373	31	4,817
1997	4,484	373	31	4,888
1998	4,565	353	22	4,940
1999	4,553	333	12	4,898
2000	4,667	316	12	4,995

Source: Alaska Consultants, Inc.

IMPACT ASSESSMENT

Social Impacts

The City of Soldotna s projected to grow at a rate of 3 percent annua ly under the base case. The high scenario tends to accelerate this rate during the first post-sale decade during the build-up of offshore employment, then slackens the growth rate once OCS-related employment starts to decline. Compared to Kenai, Soldotna enters the forecast period with a smaller population base and a higher growth rate projection. Thus, Soldotna is likely to be more affected than Kenai by a population increase comparable to Kenai's. Nevertheless, in the perspective of Soldotna's base population forecast and the growth management problems implied by it, the scenario makes a relatively minor incremental addition to growth ensuing from other sources. Also, for comparison's sake, the scenario population forecast implies a far slower growth rate than Soldotna has undergone in the previous two decades covering the earlier history of Cook Inlet petroleum development. In short, the social impacts of this scenario upon Soldotna appear to be a matter of minor degree, involving growth on a scale that can be assimilated into the existing community without major social disruptions or change.

Impacts on Community Infrastructure

Housing and Residential Land. Population growth generated by the high scenario will call for about 98 new housing units, or about 13 percent more than estimated to be needed to fulfill base case demand (see Table 181). Almost all demand for new housing occurs in the first ten years of the forecast, while in the last four years of the period, there may be a housing surplus in Soldotna. An estimated additional 7.6 hectares (19 acres) will be demanded to accommodate new residential development under the high scenario (see Table 182). According to a recent planning study, the supply of land at Soldotna is more than adequate for this level of development.

Utilities

- Mater. Apart from the need to extend the system to meet new development, Soldotna's water distribution system is adequate for capacity requirements projected under the base case (see Table 183). While the City's three wells have the pumping capacity to meet projected high scenario requirements, there have been indications in recent years that the groundwater which supplies the entire Central Peninsula area is being overdrawn and is not sufficient to meet long range demand. If such is the case, the City may have to develop an alternative water source at some time during the forecast period.

- Sewer. The high scenario forecast is not significantly different from the base case forecast (see Table 184).

- Electric Power. Under the high scenario electric power capacity requirements are projected to be about 7 percent more than estimated for the base case. Assuming the continuing availability of natural gas for the generation of power and the construction as planned of the Bradley Lake hydro-electric facility, Homer Electric Association should have adequate electric power to meet capacity requirements for its entire service area during the forecast period (see Table 185).

- Solid Waste Disposal. Disposable solid wastes estimated to be produced by Soldotna under the high scenario will demand about 1.3 hectares (3.3 acres) of additional landfill above that called for in the base case (see Table 186). There is sufficient Borough land in the area to meet this demand.

- Communications. The high scenario forecast is not appreciably different from the base case forecast (see Table 187).

Public Safety

- Police. Soldotna will not need any additional police officers or jail cells beyond those assumed for the base case to maintain adequate police service.

- Fire Protection. The improvements in firefighting facilities and services called for to serve base case growth will be adequate to cover the added fire protection requirements of the high scenario in Soldotna.

Health and Social Services. The health and social services provided under the base case should be sufficient to meet the level of growth forecast for the high scenario.

Education. Existing and planned public school facilities in Soldotna are more than adequate to meet the enrollment growth forecast for the high scenario.

Recreation. The scale of growth generated by the high scenario would not add to the demand for recreational facilities in Soldotna.

Local Government Finances. Assuming a continuation of Soldotna's recent expenditure and revenue patterns, the fiscal forecasts for Soldotna do not indicate any major change in the City's financial status (see Tables 189 and 190). However, these is reason to suspect that the impact of the high scenario upon Soldotna's public finances may be adverse, if only marginally so. The basis for this supposition is the nature of Soldotna's economic participation in the scenario. In relation to the petroleum industry, Soldotna functions primarily as a local governmental center and as a commercial center and residential community catering to oil industry employees and their service needs. Soldotna's local real property tax base is relatively undiversified, with few valuable industrial properties, numerous untaxed public facilities requiring local services and a heavy reliance upon residential and commercial rate payers. Since the high scenario appears likely to accentuate this imbalance property tax structure, it may adversely affect the City's abi ity to maintain services without imposing higher tax burdens. Also of importance in this regard is the fact that at present, Soldotna alr ady exhibits a relatively high ratio of bonded indebtedness to property tax valuation, a situation reflective of the structure of its property tax base and a situation which could be worsened by the high scenario.

CAUSE/EFFECT OF IMPACTS

The effects of the high scenario upon Soldotna are indirect, for Soldotna is geographically removed from any shore-based support operations in connection with Sale #60. Nevertheless, Soldotna's role as a residential community and provider of secondary services results in some cumulative population growth over the first decade of the scenario, up to as many as 450 additional residents or about 12 percent of Soldotna's total population at that time. The incremental impact of Sale #60 diminishes over the second decade of the scenario. Thus, the impact of Sale #60 on Soldotna can be defined essentially in terms of the need to accommodate some additional population growth, but without local industrial development.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

In past years and somewhat more slowly under the base case forecast, Soldotna is seen to be in transition toward a more developed and urbanized settlement. The high scenario, which accounts for a small share of the total growth forecast for Soldotna, lends some impetus to this trend and to the level of demand for public facilities and services. However, Soldotna appears to be adequately supplied with developable land and the basic utility and facility capacities projected under the base case forecast also seem adequate to accommodate scenario growth. In the perspective of Soldotna's twenty-year growth projection, a review of specific facility and service demands indicate that the high scenario will not of itself pose major growth management problems to the City.

SUMMARY OF IMPACTS

The Sale #60 high scenario will indirectly promote some population growth in Soldotna, but much less than will accrue from base case growth. Overall, the estimated growth rate will be less than Soldotna has experienced during the opening period of Cook Inlet oil development. In view of the public improvements that Soldotna has now installed, it is expected that Soldonta will be able to expand to absorb the scenario's population without overtaxing the community infrastructure.

TABLE 181

FORECAST OF NET CHANGE IN HOUSING DEMAND
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	197	60	34	9	17
1983		13	7	2	4
1984	1:;	55	31	9	15
1985	102	31	17	5	9
1986	245	74	41	12	21
1987	120		20	6	10
1988	342	1;:	58	17	29
1989	120	36	20	6	10
1990	320	97	54	16	27
1991	82	25	14	4	7
1992	53	16	9	3	4
1993	22	7	4	1	2
1994		29	16	5	8
1995	17:	34	19	5	10
1996	117	35	20	5	10
1997	71	22	12	4	6
1998	52	16	9	3	4
1999	-42	-13	-7	-2	-4
2000	97	29	16	5	8
TOTAL	2,332	706	394	115	197

Source: Alaska Consultants, Inc.

TABLE 182

ESTIMATED DEMAND FOR RESIDENTIAL LAND
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	89	16.0	6.2	22.2
Multifamily & Trailer	70	6.3	2.4	8.7′
1986-90				
Single Family	193	34.7	13.5	48.2
Multifamily & Trailer	154	13.9	5.4	19.3
1991-95				
Single Family	62	11.2	4.3	15.5
Multifamily & Trailer	49	4.4	1.7	6.1
1996-2000				
Single Family	50	9.0	3.5	12.5
Multifamily & Trailer	39	3.5	1.4	4.9
TOTAL	706	99.0	38.4	137.4

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 183

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Commercial and Other Capacity	Total Capacity
1982	357	186	543
1983	362	189	551
1984	385	201	586
1985	397	207	604
1986	428	223	651
1987	443	231	674
1988	483	253	736
1989	495	261	756
1990	531	282	813
1991	541	287	828
1992	549	291	840
1993	553	292	845
1994	565	298	863
1995	579	306	885
1996	593	313	906
1997	602	318	920
1998	609	321	930
1999	604	318	922
2000	616	325	941

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 184

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
7982	354	44.3
1983	357	44.7
1984	380	47.5
1985	393	49.1
1986	423	52.9
1987	437	54.6
1988	466	58.2
1989	467	58.4
1990	487	60.9
1991	496	62.0
1992	508	63.5
1993	518	64.8
1994	531	66.4
1995	543	67.9
1996	556	69.5
1997	564	70.6
1998	573	71.7
1999	571	71.4
2000	585	73.1

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 185

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
HIGH FIND SCENARIO
SOLDOTNA AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,725
1983	10,890
1984	11,572
1985	11,955
1986	12,874
1987	13,324
1988	14,606
1989	15,056
1990	16,256
1991	16,564
1992	16,762
1993	16,845
1994	17,205
1995	17,625
1996	18,064
1997	18,330
1998	18,525
1999	18,367
2000	18,731

Source: Alaska Consultants, Inc.

TABLE 186

ESTIMATED DISPOSABLE SOLID WASTES
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,792	16,920
1983	2,892	17,526
1984	3,135	18,998
1985	3,303	20,016
1986	3,593	21,774
1987	3,755	22,755
1988	4,158	25,197
1989	4,329	26,234
1990	4,721	28$609
1991	4,810	29,149
1992	4,868	29,500
1993	4,892	29,646
1994	4,996	30,276
1995	5,118	31,015
1996	5,246	31,791
1997	5,323	32,257
1998	5,380	32,603
1999	5,334	32,324
2000	5,440	32,966

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 187

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
HIGH FIND SCENARIO
CITY OF SOLDTONA
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	867	1,118	85
1983	880	1,144	26
1984	935	1,225	81
1985	966	1,275	50
1986	1,040	1,383	108
1987	1,076	1,442	59
1988	1,180	1,593	1 51
1989	1,216	1,654	61
1990	1,313	1,799	145
1991	1,338	1,846	47
1992	1,354	1,882	36
1993	1,361	1,905	23
1994	1,390	1,946	41
1995	1,424	1,994	48
1996	1,459	2,043	49
1997	1,481	2,073	30
1998	1,497	2,096	23
1999	1,484	2,078	(18)
2000	1,513	2,118	40

Source: Alaska Consultants, Inc.

TABLE 188

SCHOOL ENROLLMENT FORECAST
HIGH FIND SCENARIO
SOLDOTNA AREA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	343	229	572
1983	349	232	581
1984	370	247	617
1985	383	255	638
1986	412	275	687
1987	427	284	711
1988	467	312	779
1989	482	321	803
1990	520	347	867
1991	530	353	883
1992	536	358	894
1993	539	359	898
1994	551	367	918
1995	564	376	940
1996	578	385	963
1997	587	391	978
1998	593	395	988
1999	588	392	980
2000	599	400	999

Source: Alaska Consultants, Inc.

TABLE 189

GENERAL FUND
REVENUE FORECAST
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 555	$ 590	$ 321	$ 473	$1,939
1983	564	599	326	481	1,970
1984	599	637	346	511	2,093
1985	619	658	357	528	2,162
1986	667	708	385	568	2,328
1987	690	733	398	588	2,409
1988	756	803	437	645	2,641
1989	780	828	450	665	2,723
1990	842	894	486	718	2,940
1991	858	911	495	731	2,995
1992	868	922	501	740	3,031
1993	872	927	504	744	3,047
1994	891	946	514	759	3,110
1995	913	969	527	778	3,187
1996	935	994	540	797	3,266
1997	949	1,008	548	809	3,314
1998	959	1,019	554	818	3,350
1999	951	1,010	549	811	3,321
2000	970	1,030	560	827	3,387

a/ "Other" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 190

FORECAST OF REVENUES AND OPERATING EXPENDITURES
HIGH FIND SCENARIO
CITY OF SOLDOTNA
1982 - 2000
($1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,939	$1,640	$ 299
1983	1,970	1,665	305
1984	2,093	1,770	323
1985	2,162	1,828	334
1986	2,328	1,969	359
1987	2,409	2,038	371
1988	2,641	2,234	407
1989	2,723	2,303	420
1990	2,940	2,486	454
1991	2,995	2,533	462
1992	3,031	2,564	467
1993	3,047	2,576	471
1994	3,110	2,631	479
1995	3,187	2,696	491
1996	3,266	2,763	503
1997	3,314	2,803	511
1998	3,350	2,833	517
1999	3,321	2,809	512
2000	3,387	2,865	522

a/ The City of Soldotna does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

Homer

COMMUNITY FORECASTS - HIGH SCENARIO

Future Population

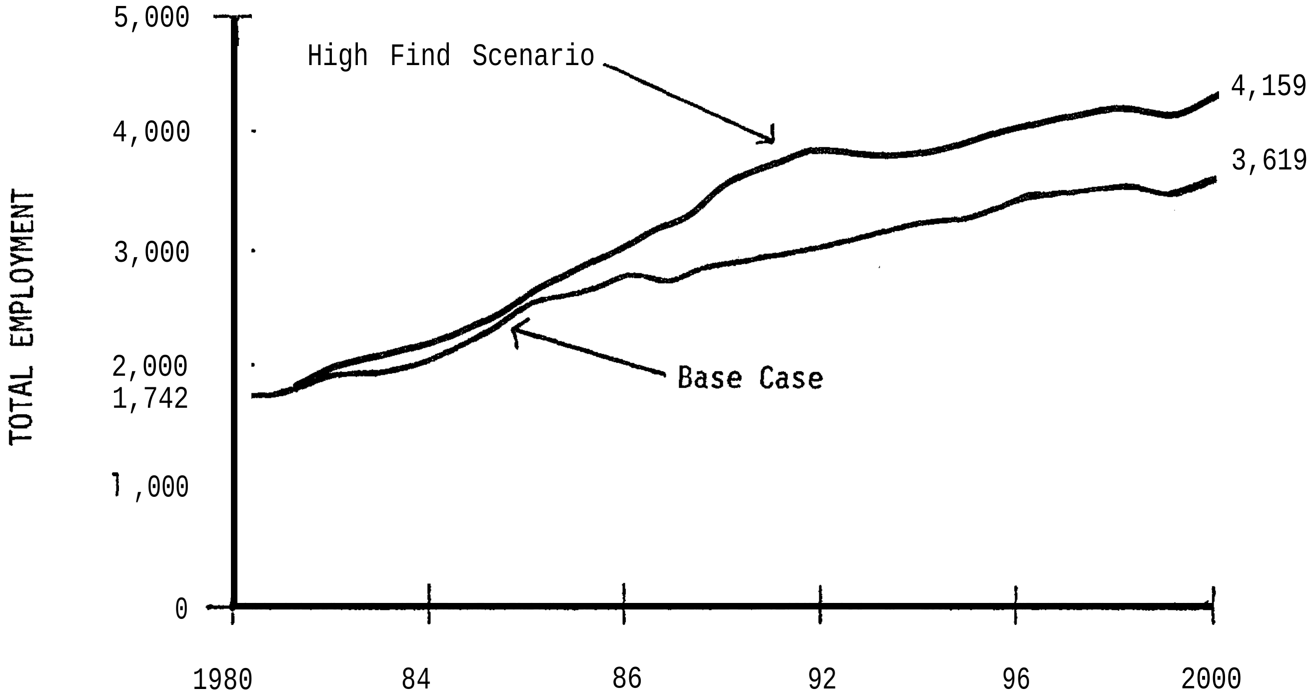
The trend of future population growth in the Homer area attributable to the high scenario parallels the pattern of employment growth. That is, sale-related population growth is slow and small-scale during the first half-dozen years following the sale, then climbs rapidly during the early production years and falls off slowly but steadily thereafter.

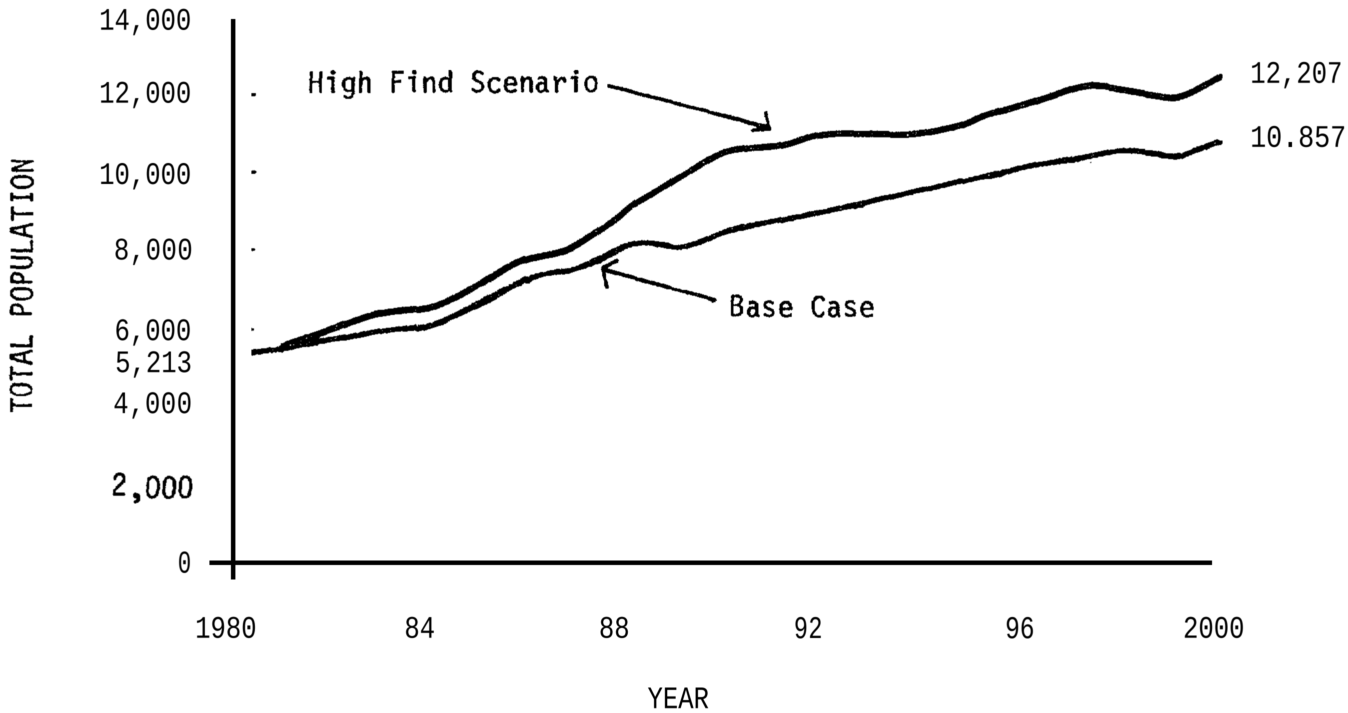
The population forecast uses a multiplier of 2.5 added persons for each added job in the area's employment base. Applying this multiplier to the employment forecast yields an estimated peak population impact in the Homer area of 1,989 persons. The average OCS-dependent population over the production years is about 1,550 persons. It is anticipated that half of this areawide population growth will occur within the City of Homer's boundaries and half in the unincorporated area surrounding Homer. Thus, the population impact upon the City of Homer during the production years averages about 775 persons (see Table 191).

Under base case assumptions, the City of Homer is anticipated to grow in population by more than 150 percent from an estimated 2,148 persons in 1980 to 5,429 by the close of the forecast period in 2000. In comparison, Sale #60 is expected to account for about 20 percent of the City's total

FIGURE 13

Homer Area
Total Employment and Total Population
Base Case and High Find Scenario
Lower Cook Inlet
1980 - 2000





Source: Alaska Consultants, Inc.

TABLE 191

FORECAST OF POPULATION
HIGH FIND SCENARIO
LOWER COOK INLET - CITY OF HOMER
1982 - 2000

Year	Base Case Population	Resident OCS-Offshore Population	Resident OCS-Onshore Population	Total Population
1982	2,450	53	39	2,542
1983	2,610	88	63	2,761
1984	2,793	88	63	2,944
1985	3,055	88	63	3,206
1986	3,427	95	48	3,570
1987	3,707	116	29	3,852
1988	4,036	343	33	4,412
1989	4,090	560	69	4,719
1990	4,280	870	60	5,210
1991	4,341	900	49	5,290
1992	4,493	815	56	5,364
1993	4,631	688	56	5,375
1994	4,773	675	56	5,504
1995	4,920	710	56	5,686
1996	5,075	743	56	5,874
1997	5,187	743	56	5,986
1998	5,306	703	50	6,059
1999	5,252	664	48	5,964
2000	5,429	630	45	6,104

Source: Alaska Consultants, Inc.

population growth under the high scenario by 2000 at which time an estimated 10 percent of the City's residents may be directly or indirectly supported by OCS Sale #60.

IMPACT ASSESSMENT

Social Impacts

Even under the base case, Homer is projected to attain a rapid growth rate of 4 to 5 percent annually and will, therefore, confront a full agenda of growth management issues. It is expected that offshore oil and gas activities unrelated to Sale #60 will assume a significant and perhaps controversial position in the town's changing economic base and community life, particularly with reference to the town's traditional fisheres and tourism economy and rural life style.

Sale #60 is forecast to accelerate the pace and to magnify the scale of population growth as Homer continues in its transition toward a more diversified and urban settlement. Of special importance from the point of view of social impact on the community is the circumstance that the large increment of population resulting from Sale #60 will be economically dependent on and oriented to the offshore petroleum industry. Consequently, there is latent potential for economic and social polarization within the community based on the divergent attitudes toward development of the energy industry and Homer's traditional and familiar fisheries and tourism and recreation industries.

Impacts on Community Infrastructure

Housing and Residential Land. Compared to the base case, the high scenario accelerates substantially the estimated rate of growth in housing demand during the middle years of the forecast period. As Homer's role as a forward support base diminishes when the gas and oil production peak in 1992, demand for new housing decreases and in the last years of the forecast, there is a housing surplus in Homer under the high scenario. Overall, the incremental effect above the base case upon demand levels at the close of the forecast period is about 200 dwelling units and about 16 hectares (40 acres) of land newly converted to residential use (see Tables 192 and 193). This is more than one-fifth of the total increase in housing and residential land estimated to be needed under the base case.

Utilities

- Water. Even with the additional industrial water consumption associated with the support base supplying offshore activities, the water demand estimated for the high scenario can be supplied by the City through the end of the forecast (see Table 194).

- Sewer. Apart from improvements to the distribution system and treatment plant designed to accommodate base case growth, an additional 806 kiloliters (213,000 gallons) per day in treatment plant capacity will be called for to process sewage generated during the high scenario forecast (see Table 195).

- Electric Power. Assuming the continuing availability of natural gas for power generation and the construction of the Bradley Lake hydro-electric facility, Homer Electric Association will be able to maintain adequate electric power for the high scenario (see Table 196).

- Solid Waste Disposal. Disposable solid wastes produced in the Homer area during the high scenario will consume an additional 6 hectares (15 acres) of landfill above that called for by the base case (see Table 197).

- Communications. The high scenario is not materially different from the base case (see Table 198).

Public Safety

- Police. To maintain a standard level of police service under the high scenario, it is estimated that the City of Homer may need one additional police officer and jail cell beyond those demanded by the base case. Some expansion in staffing of the Alaska State Troopers may also be warranted since that agency provides police protection outside the City of Homer.

- Fire Protection. The improvements in firefighting facilities and services needed to serve base case growth should be adequate to cover the added fire protection requirements of the high scenario in the City of Homer. However, residential development north of the City may necessitate establishment of a new fire service area.

Health and Social Services. The level of growth forecast for the Homer area under the high scenario is likely to merit the addition of three to four hospital beds and one physician.

Education. Under the base case forecast, the Kenai Peninsula Borough was seen to construct a new elementary school with 13 to 14 classrooms and an addition to the secondary school of about three classrooms. Enrollment growth forecast for the high scenario will probably warrant the construction of at least three more elementary and two secondary school classrooms (see Table 199).

Recreation. The high scenario places no additional demand on Homer for recreation facilities beyond those expected to be developed for the base case.

Local Government Finances. The imposition of Sale #60's growth on top of Homer's generally rapid growth will likely generate significant additional fiscal burdens upon the City. Even under the base case, major public improvements programs will be called for, to the point where heavy demands upon Homer's debt service capacity are expected. Currently, Homer has a better than average ratio of debt to assessed valuation in comparison to most middle-sized Alaska municipalities, but also a relatively small share of revenues available to support capital projects (see Table 201). Since the Sale #60 scenario does not augment Homer's property tax base with new OCS industrial facilities to offset its allied expenditure burdens, it appears that the scenario considered apart may adversely affect the already pinched balance of revenues and expenditures for the City of Homer.

CAUSE/EFFECT OF IMPACTS

Even under the base case, Homer is propelled into a role in offshore oil and gas development by virtue of the convenient location of its port and airport in relation to the Sale CI tracts. The high scenario of Sale #60 magnifies Homer's direct involvement in OCS activities. In fact, it is expected that Homer will host more Sale #6o onshore employees than either Kenai or Soldotna. Even more significant is that Homer also attracts a larger share of offshore employees as permanent residents. Thus, Homer is, in numerical terms of population growth, more powerfully impacted than Kenai or Soldotna. Because it is a smaller community to start with, it is also relatively more affected. Finally, because the expected impact of Sale #60 comes on top of a rapidly growing base population -- over a 150 percent increase during the forecast period -- the high scenario compounds growth impacts which would in any case be formidable.

PROBLEMS/ISSUES AFFECTING THE COMMUNITY INFRASTRUCTURE

At the outset of the scenario, Homer is, of the three study area communities, least equipped with basic public utilities and most hampered by physical constraints on its development. The high scenario may be expected to aggravate the infrastructure problems previously noted in the base case forecasts.

These problems include inadequacies in the water treatment and sanitary waste treatment facilities; solid waste disposal and public safety facilities. Projected expansion of Homer's role in the fishing and fish processing industry as well as the offshore support industries may intensify development demands upon Homer Spit and the City's port facilities.

SUMMARY OF IMPACTS

The effect of the high scenario is forecast to be an intensification of growth at Homer, contributing to a near tripling of the City's population by the end of the forecast period. Sale #60 alone accounts for about one-quarter of this growth. Together with the impact of earlier Sale CI, this represents the entrance of a substantial OCS-related economic component to Homer's economy and a new dimension in the community's economic base. Because of competing demands for port facilities, potential conflicts between oil and fishing operations and the stresses on overtaxed housing and public services, there is potential for conflict and unrest in the community. If the growth forecasts of this scenario are realized, it is likely that Homer's semi-rural and distinctive life style will be compromised by a swift trend to a more developed and business-like character.

TABLE 192

FORECAST OF NET CHANGE IN HOUSING DEMAND
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Net Population Change	Net Change Demand for Housing Units	Single Family	Multi-Family	Trailer
1982	252	76	46	6	24
1983	219	66	40	5	21
1984	183	55	33	4	18
1985	262	79	48	6	25
1986	364	110	66	9	35
1987	282		51	7	27
1988	560	1?;	102	14	54
1989	307	93	56	7	30
1990	491	149	89	12	48
1991	80	24	14	2	8
1992	74	22	13	2	7
1993		3	2	0	1
1994	1;;	39	23	3	13
1995	182	55	33	4	18
1996	188	57	34	5	18
1997	112	34	20	3	11
1998	73	22	13	2	7
1999	-95	-29	-18	-2	-9
2000	140	42	25	3	14
TOTAL	3,814	1,152	690	92	370

Source: Alaska Consultants, Inc.

TABLE 193

ESTIMATED DEMAND FOR RESIDENTIAL LAND
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000

	Net New Housing Units	Net New Residential Land Use (acres) a/	Public Rights of Way (acres) a/	Gross New Residential Land Use (acres) a/
1982-85				
Single Family	167	30.1	11.7	41.8
Multifamily & Trailer	109	9.8	3.8	13.6
1986-90				
Single Family	364	65.5	25.5	91.0
Multifamily & Trailer	243	21.9	8.5	30.4
1991-95				
Single Family	85	15.3	6.0	21.3
Multifamily & Trailer	58	5.2	2.0	7.2
1996-2000				
Single Family	74	13.3	5.2	18.5
Multifamily & Trailer	52	4.7	1.8	6.5
TOTAL	1,152	165.8	64.5	230.3

a/ Multiply by .40469 to obtain hectares.

Source: Alaska Consultants, Inc.

TABLE 194

PROJECTED CAPACITY REQUIREMENTS
WATER SUPPLY SYSTEM
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000
(1,000 gallons per day) a/

Year	Domestic Capacity	Industrial Capacity	Total Capacity
1982	316	653	969
1983	343	720	1,063
1984	366	741	1,107
1985	399	828	1,227
1986	444	942	1,386
1987	479	990	1,469
1988	543	1,150	1,693
1989	576	1,207	1,783
1990	630	1,282	1,912
1991	639	1,259	1,898
1992	650	1,278	1,928
1993	655	1,280	1,935
1994	671	1,311	1,982
1995	693	1,354	2,047
1996	716	1,399	2,115
1997	730	1,425	2,155
1998	740	1,441	2,181
1999	729	1,417	2,146
2000	747	1,450	2,197

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 195

ESTIMATED CAPACITY REQUIREMENTS
DOMESTIC SEWAGE TREATMENT
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Daily Treatment Capacity (1,000 gallons) a/	Peak Hourly Capacity (1,000's gallons per hour) a/
1982	319	39.9
1983	348	43.5
1984	371	46.4
1985	404	50.5
1986	447	55.9
1987	481	60.1
1988	545	68.1
1989	581	72.6
1990	634	79.2
1991	642	80.2
1992	654	81.8
1993	659	82.4
1994	675	84.4
1995	697	87.1
1996	720	90.0
1997	734	91.8
1998	743	92.9
1999	732	91.5
2000	750	93.8

a/ Multiply gallons by 3.785 to obtain liters.

Source: Alaska Consultants, Inc.

TABLE 196

ESTIMATED ELECTRIC POWER
CAPACITY REQUIREMENTS
HIGH FIND SCENARIO
HOMER AREA
1982 - 2000

Year	Estimated Capacity Requirements in kw's
1982	10,257
1983	11,109
1984	11,774
1985	13,011
1986	14,380
1987	15,152
1988	16,614
1989	18,149
1990	19,718
1991	19,961
1992	20,250
1993	20,291
1994	20,775
1995	21,467
1996	22,163
i 997	22,573
1998	22,832
1999	22,440
2000	22,962

Source: Alaska Consultants, Inc.

TABLE 197

ESTIMATED DISPOSABLE SOLID WASTES
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Annual Tonnage a/	Annual Volume (cubic yards) b/
1982	2,566	15,261
1983	2,863	16,961
1984	3,085	18,446
1985	3,531	21,053
1986	3,972	23,598
1987	4,189	25,002
1988	4,781	28,722
1989	5,285	31,602
1990	5,799	34,648
1991	5,761	34,912
1992	5,841	35,396
1993	5,853	35,469
1994	5,994	36,324
1995	6,192	37,524
1996	6,397	38,766
1997	6,519	39,505
1998	6,598	39,984
1999	6,495	39,360
2000	6,647	40,281

a/ Multiply by .9070294 to obtain metric tons.
b/ Multiply by .7646 to obtain cubic meters.

Source: Alaska Consultants, Inc.

TABLE 198

ESTIMATED CAPACITY REQUIREMENTS
TELEPHONE SYSTEM
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000

Year	Total Number of Dwellings	Total Number of Telephones	Annual Increase
1982	770	993	105
1983	836	1,087	94
1984	891	1,167	80
1985	970	1,280	113
? 986	1,080	1,436	156
1987	1,165	1,561	125
1988	1,335	1,802	241
1989	1,428	1,942	140
1990	1,577	2,160	218
1991	1,601	2,209	49
1992	1,623	2,256	49
1993	1,626	2,276	20
1994	1,665	2,331	55
1995	1,720	2,408	77
1996	1,777	2,488	80
1997	1,811	2,535	47
1998	1,833	2,566	31
1999	1,804	2,526	(40)
2000	1,846	2,584	58

Source: Alaska Consultants, Inc.

TABLE 199

SCHOOL ENROLLMENT FORECAST
HIGH FIND SCENARIO
HOMER AREA
1982 - 2000

Year	Elementary Enrollment	Secondary Enrollment	Total Enrollment
1982	305	203	508
1983	331	221	552
1984	343	236	589
1985	385	256	641
1986	428	286	714
1987	462	308	770
1988	529	353	882
1989	566	378	944
1990	625	417	1,042
1991	635	423	1,058
1992	644	429	1,073
1993	645	430	1,075
1994	661	440	1,101
1995	682	455	1,137
1996	705	470	1,175
1997	718	479	1,197
1998	727	485	1,212
1999	716	477	1,193
2000	733	488	1,221

Source: Alaska Consultants, Inc.

TABLE 200

GENERAL FUND
REVENUE FORECAST
HIGH FINDSCENARIO
CITY OF HOMER
1982 - 2000
$1,000s)

Year	Property Taxes	Sales Taxes	Intergovernmental Revenues	Other a/	Total
1982	$ 620	$ N/A	$ 407	$ 98	$1,125
1983	673	N/A	442	106	1.221
1984	718	N/A	472	113	1:303
1985	782	N/A	514	123	1,419
1986	870	N/A	572	137	1,579
1987	939	N/A	617	148	1,704
1988	1,076	N/A	707	170	1,953
1989	1,150	N/A	756	181	2,087
1990	1,270	N/A	835	200	2,305
1991	1,290	N/A	847	203	2,340
1992	1,380	N/A	859	206	2,373
1993	1,310	N/A	861	207	2,378
1994	1,342	N/A	882	212	2,436
1995	1,386	N/A	911	219	2,516
1996	1,432	N/A	941	226	2,599
1997	1,459	N/A	959	230	2,648
1998	1,477	N/A	971	233	2,681
1999	1,454	N/A	955	229	2,638
2000	1,488	N/A	978	235	2,701

a/ "other'" includes license fees, permits, interest earnings, sale and rental of municipal property and miscellaneous other revenues.

Source: Alaska Consultants, Inc.

TABLE 201

FORECAST OF REVENUES AND OPERATING EXPENDITURES
HIGH FIND SCENARIO
CITY OF HOMER
1982 - 2000
$1,000s)

Year	General Fund Revenues	Operating Expenditures a/	Available for Capital Improvements a/
1982	$1,125	$1,011	$ 114
1983	1,221	1,098	123
1984	1,303	1,171	132
1985	1,419	1,275	144
1986	1,579	1,420	159
1987	1,704	1.532	172
1988	1,953	1 ,755	198
1989	2,087	1,877	210
1990	2,305	2 ,072	233
1991	2,340	2,104	236
1992	2,373	2,133	240
1993	2,378	2,138	240
1994	2,436	2,189	247
1995	2,516	2,262	254
1996	2,599	2,336	263
1997	2,648	2,381	267
1998	2,681	2,410	271
1999	2,638	2,372	266
2000	2,701	2,428	273

a/ The City of Homer does not make any direct expenditures for school support. The Kenai Peninsula Borough funds and operates a boroughwide school system.

Source: Alaska Consultants, Inc.

APPENDIX

Methods, Standards and Assumptions

INTRODUCTION

The following assumptions and standards have been developed for local government services and revenues for the Lower Cook Inlet communities of Homer, Kenai and Soldotna. These standards, methods and assumptions were refined and modified during the course of this study as additional inputs were made by other subcontractors and as additional data were developed by this subcontractor. Therefore, the methods, standards and assumptions which follow are the basis for the impact analysis.

ECONOMY AND POPULATION

Forecasting economic growth or decline which serves as a basis for the population forecasts in the Lower Cook Inlet Analysis is complicated since a previous OCS lease sale is assumed to be a part of the base case forecast. The first generation lower Cook Inlet lease sale referred to as "Sale CI" was held on October 27, 1977. It is further complicated by an assumed North Kenai liquefied natural gas (LNG) facility construction and operations. This plant is not directly related to OCS lease sales and is assumed to be operating at capacity prior to the flow of Sale 60 gas. However, it is assumed as a part of the overall processing capacity demanded for OCS gas processing.

The incorporation o· Sale CI into the base case necessitates a non-OCS forecast of economy and population as if no OCS development was taking place or would cont· nue in the future and the development of an OCS scenario representative of Sale CI. In addition, a scenario representative of the construction and operations of a North Kenai LNG facility must be formulated. The non-OCS forecast, the sale CI forecast and the North Kenai LNG facility forecast added together form the base case. The base case is completed prior to portraying the effects of the forthcoming Lower Cook Inlet (and Shelikof Strait) OCS Lease Sale Number 60 scenarios upon the Kenai-Cook Inlet Census Division and the cities of Kenai, Seldovia and Homer.

Non-OCS Forecast

The method of forecasting non-OCS growth (or decline) which serves as a basis for the forecasts of population is the economic base method. This method stresses the importance of export activity as a determining factor in regional and community economic growth. Regions or cities within a specialized economy must import goods and services to survive. To pay for these imports, these regions or communities must in turn export to other regions. Therefore, a basic sector of regional or community activity will be the production of goods and services for export. Another sector (secondary) of regional or community activity which because of convenience and comparative cost will take place within the region or community.

This method is derived from modern theories of international and interregional trade and it makes use of such economic concepts as the multiplier. The method is clearly restricted since among other reasons difficulties are encountered in allocating activities to basic and secondary sectors, external money flows into a region are not generally accounted for and the handling of indirect effects is necessarily unclear. However, the sensitivity to fluctuations of an export base will be greater, the smaller the area. (In populous areas of the nation, the multiplier approximates that of the nation.) Thus, it provides an adequate explanation of economic development in small communities where the flow of goods and services within the community is limited.

Although to varying degrees, economic base studies have used units of measure such as jobs, payroll, value added, value of production and dollar income and expenditure accounts, most studies have involved employment as a sole or primary unit of measure. In this study, employment is used as the primary unit of measure and as the basis for forecasting the magnitude of future economic and population growth or decline.

In this economic base forecast, the activities of certain employers are classified as basic (exogenous). This group is composed of employees working in export industries or performing labor based upon fortunes determined by forces outside the city or region. All other employees are classified as secondary (endogenous). The fortunes of the employees of these industries are determined by internal forces which are represented by a multiplier linking the export sector to total regional or community employment.

In a simple economic model, secondary employment is shown as a function of total employment

$$Ys = f(Yt)$$

and

$$Yt = Ys + E$$

where: Yt = total community or regional employment

Ys = total community or regional secondary employment

E = total community or regional basic employment. This is the sum of all basic employment as arrayed in the

Standard Industrial Classification Manual by following divisions: Agriculture, Forestry and Fishing; Mining; Contract Construction; Manufacturing; Transportation, Communications and Public Utilities; Trade; Finance, Insurance and Real Estate; Service; and Government.

Furthermore, this analysis hypothesizes simple homogeneous relationships expressing secondary employment as a constant proportion, k, of total employment

i.e.: $Ys = kYt$

so that: $Yt = \left(\frac{1}{1 - k}\right)E = mE$

and so that m, the multiplier, $\frac{1}{1 - k} = \frac{1}{1 - \left(\frac{Ys}{Yt}\right)} = \frac{Yt}{E} = \frac{Ys + E}{E} = 1 + \frac{Ys}{E}$.

The multiplier is estimated by observing the historic relationship between the activities of the export sector and total regional activities. Then given the estimates of the future magnitude of basic employment as foreseen in each SIC division resulting from export activity, the application of the multiplier yields a forecast of total employment as a reflection of total regional or community economic activity. Furthermore, total regional or community employment multiplied by a population dependency ratio gained by observing the historic relationship of total employment to total population produces a forecast of total population.

Present Employment Estimates. As a result of research into economic prospects of the State, region and local economies from published materials, a precise definition of the region and the communities to be studied was determined. The region of study is defined as the Kenai-Cook Inlet Census Division. This conforms by definition to the Kenai-Cook Inlet Labor Area. The Homer area was defined by the census area of Homer Precinct, Anchor Point, Fritz Creek, Dimond Ridge and Kachemak. And, because of the interrelationship between the communities of the City of Kenai and adjacent areas and the City of Seldovia and adjacent areas, these areas were integrated into one area defined by the census areas of Kenai Precinct Numbers 1, 2 and 3, Nikishki Precinct Numbers 1 and 2, Soldotna, Ridgeway and Kalifonsky.

Within these areas of study, informal interviews of employers and other knowledgeable individuals were conducted. From a review of written materials and the interviews, the basis of the present economic activities and the potential for future growth or decline of the Kenai-Soldotna and Homer area are assessed. The process of investigation is carried out for each sector of the regional and local economies.

In the less populous Homer area, informal interviews of all employers are conducted. Among the information obtained is the following:

- The number of full-time and part-time salaried employees.
- The number of months worked by the employees.
- The product(s) or services(s) produced or delivered.

- The quantities of product produced by major manufacturers such as fish processing plants.
- The months during which the product is produced.
- The suppliers to the major manufacturing plants such as the number and type of fishing vessels (to estimate the number of jobs in fishing).
- The percent of the firm's business (revenues) resulting from activities (sales) related to firms and individuals outside the region or the local area.
- The plans of the firms regarding expansion or retrenchment which would result in increased or decreased employment.
- The views of the owners or operators of the firm regarding future prospects of their firm and their industry, estimates and timing of major growth or decline in terms of employment and opinions on future seasonality.

In the more populous Kenai-Soldotna area, only selected informal interviews are conducted. This sample interviewing together with published and unpublished employment data provided by the Employment Security Division of the Alaska Department of Labor are relied upon to convey information similar to that obtained by interviewing the universe in the Homer area.

Since the Kenai-Soldotna and Homer areas are the main components of the Kenai-Cook Inlet Census Division, the information collected for these areas coupled with published and unpublished employment data provided by the Employment Security Division of the Alaska Department of Labor provide the basis of current employment estimates for the Kenai-Cook Inlet Census Division. Since the employment information collected for the Homer area is 1979 data, past trends by sector are calculated to project the Employment Security Division data from the last reporting period in 1977 to 1979. Thus, the average annual full-time employment for the Kenai-Cook Inlet Census Division, the Kenai-Soldotna area and the Homer area are 1979 estimates or counts.

The employment in each of these geographic areas is then arrayed by major industrial division in conformance with the Office of Management and Budget's Standard Industrial Classification. The SIC Manual defines industries in accordance with the composition and structure of the economy and covers the entire field of economic activity. The following base year data necessary for the forecasting process is produced:

- The distribution of basic and secondary employment by industrial sector.
- The basic, secondary and total employment.
- The employment multiplier.

The 1979 base year average annual full-time employment is provided in Table 1 as an illustration. The multiplier is as follows:

$$\frac{Yt}{E} = \frac{1621}{922} = 1.7581 \text{ or } 1.76$$

TABLE A-1

AVERAGE ANNUAL FULL-TIME EMPLOYMENT a/
HOMER LABOR AREA b/

Industry Classification	Number	%	% Basic	Basic Number	Secondary Number
Agriculture, Forestry and Fishing	400 c/	24.7	98	392	8
Mining	0 d/	0.0		0	0
Contract Construction	49	3.0	12	6	43
Manufacturing	151	9.3	95	143	8
Transportation, Communication & Public Utilities	139	8.6	46	64	75
Trade	311	19.2	37	115	196
Finance, Insurance & Real Estate	77	4.7	31	24	53
Service	198	12.2	24	53	145
Government	296	18.3	42	125	171
Federal	(78)	(4.8)	(80)	(62)	(16)
State	(71)	(4.4)	(48)	(34)	(37)
Local	(147)	(9.1)	(20)	(29)	(118)
TOTAL	1,621	100.0	57	922	699

a/ Includes selfemployed and military personnel.
b/ The Homer Labor Area is defined as the Homer Precinct, Anchor Point, Fritz Creek, Dimond Ridge and Kachemak.
c/ Number of fishermen employed on an average annual year-round basis estimated by using yearly registration data, length of fishing season and normal “crew” sizes for various types of fishing vessels.
d/ Minor employment in sand and gravel considered with contract construction and transportation.

Source: Alaska Consultants, Inc.

Forecast of Non-OCS Employment. With the significant factors which would affect future growth or decline in the regional or community industries identified and basic employment by industry sector for the base year estimated, basic employment by industry as translated into SIC industry sectors is forecast by industry sector. For example, the following abbreviated assumptions regarding growth in basic employment in percentage form were made for 1980 in the Homer area.

Industrial Classification	1979 Basic Employment	Forecast Growth %	1980 Basic Employment
Agriculture, Forestry and Fishing	392	5	412
Mining	0	0	0
Contract Construction	6	4	
Manufacturing	143	5	15:
Transportation, Communication, and Public Utilities	64	4	67
Trade	115	4	120
Finance, Insurance and Real Estate	24	4	25
Service	53	4	55
Government	1 25	3	129
Total	922		964

The sum of the basic employment forecasts by industry sector in any given year equals total basic employment in that year. And, since the multiplier is assumed to remain constant over time, the employment multiplier times total basic employment equals total employment. In the Homer area forecast, for example, the following results for 1980:

$$Yt = mE = 1.76x\ 964 = 1697.$$

Secondary employment is then derived through the following formula:

$$Ys = Yt - E = 1697 - 964 = 733.$$

Present Non-OCS Population Estimates. Population in the base year 1979 is derived from a special census of population for the Kenai Peninsula Borough conducted in 1978. Population was enumerated for the Kenai-Cook Inlet Census Division which conforms to the area of the employment tabulation or the Kenai-Cook Inlet labor area. Similarly, the areas in which the employment was counted or estimated, the Kenai-Soldotna area and the Homer area, conform to the precinct areas in the census. The Homer area includes the Homer Precinct (City of Homer), Anchor Point, Fritz Creek, Dimond Ridge and Kachemak. The Kenai-Soldotna area includes Kenai Precinct Numbers 1, 2 and 3 (City of Kenai), Nikishki Precinct Numbers 1 and 2, Soldotna (City of Soldotna), Ridgeway and Kalifonsky.

A projection of population based upon the rate of growth for these areas between the 1970 Census and the 1978 Census is made for one year so that the present employment estimates and the present population estimates are for the same base year.

The base year non-OCS population is then divided by the base year non-OCS employment. The product is a dependency ratio for estimating total non-OCS population from total non-OCS employment in future years. An example of this ratio in the base year for the Kenai-Cook Inlet Census Division is:

$$\frac{\text{Estimated 1979 Population}}{\text{Estimated 1979 Employment}} \;.\; \frac{23,552}{7,795} = 3.0 \text{ Dependency Ratio}$$

Forecast of Non-OCS Population. The dependency ratio produced by dividing total non-OCS employment into total non-OCS population is employed to forecast total non-OCS population on an annual basis throughout the planning period from 1980 to 2000. Although dependency ratios are subject to change based upon a number of factors, this forecast utilizes a constant dependency ratio throughout the forecast period. There is an exception, the Homer area, where there is an inordinately high dependency ratio of 3.3 persons per employee in the base year. Because of the nature of the activities forecast in the Homer area, it is assumed that the ratio will be closer to the Kenai-Cook Inlet Census Division of which the Homer area is part. Therefore, 3.0 persons per employee was maintained as a constant throughout the forecast period. An example of the application of this ratio in the Homer area in 1980 is as follows:

$$\text{Total Non-OCS Employment} \times \text{Dependency Ratio} = 1,697 \text{ X } 3 = 5,091 \text{ Total Non-OCS Population}$$

Forecast of OCS Lease Sale CI Employment and Population

In order to portray Sale CI as an element in the base case forecast of employment and population, it is necessary to construct a medium find scenario which would result in the production of approximately 402 million barrels of oil and 402 billion cubic feet of unassociated natural gas. It is also necessary to simulate the construction of basic pipelines upon which major elements of the OCS Lease Sale 60 scenarios depend. Sale CI must be incorporated into the base case along with the North Kenai LNG facility scenario prior to portraying the effects of Lease Sale 60.

The production of the Sale CI Medium Find Scenario is similar to the Sale 60 High Find Scenario for Lower Cook Inlet only (not including Shelikof Strait) with the exception of the timing of production which would take place in 1986 rather than 1989, the termination of production which would be in 13 years rather than 15 years and the pipelines required for transportation.

Because of the close relationship between these scenarios, the forecasts of employment and resulting population from Sale CI were modeled from Sale 60. Employment by groups of tasks (see Table A-2) in the lower Cook Inlet portion of the High Find Scenario of Sale 60 as described in the <u>Alaska OCS Socioeconomic Studies Program Lower Cook Inlet and Shelikof Strait OCS Lease Sale No. 60 Petroleum Development Scenarios</u> prepared by Dames and Moore was used with modifications.

The schedule was adjusted with production beginning in 1986. The period of oil production was shortened from 15 to 13 years. Conversely, the period of gas production was increased from 8 to 10 years. And the pipeline scenarios were altered to accommodate the Lower Cook Inlet oil production scenario in the Sale 60 Medium Find Scenario and the gas production scenario in the Sale 60 High Find.

This scenario to portray the impact of Sale CI upon the Kenai-Cook Inlet Labor Area and the communities of Homer, Kenai and Soldotna was reviewed by Dames and Moore and deemed to be representative of the Meduim Find Scenario for Sale CI.

TABLE A-2

AGGREGATION OF ONSHORE AND OFFSHORE EMPLOYMENT BY TASK
LOWER COOK INLET - SHELIKOF STRAIT

ONSHORE (Functions requiring onshore employment)

Service Base

- Exploration Well Drilling
- Geophysical and Geological Survey
- Supply/Anchor/Tug Boat for Rigs
- Development Drilling
- Steel Jacket Installations and Commissioning
- Concrete Platform Installation and Commissioning
- Pipeline Offshore, Gathering, Oil and Gas
- Pipeline Offshore, Trunk, Oil and Gas
- Supply/Anchor/Tug Boat for Platform
- Supply/Anchor/Tug Boat for Lay and Bury Barge
- Longshoring for Platform Installation
- Longshoring for Lay and Bury Barge
- Maintenance and Repairs for Platform and Supply Boats
- Longshoring for Platform Operations

Helicopter Service

- Helicopter for Rigs
- Helicopter Support for Platform Installation
- Helicopter Support for Lay and Bury Barge
- Helicopter for Platform

Construction

- Temporary or Advance Service Base
- Permanent Service Base
- Pipe Coating
- Onshore Trunk Pipeline
- Marine Oil Terminal
- LNG Plant

Oil Terminal Operations

- Oil Terminal and Pipeline Operations

LNG Plant Operations

- LNG Plant and Pipeline Operations

OFFSHORE (Functions requiring offshore employment)

Survey

- Geophysical and Geological Survey

Rig

- Exploration Well Drilling

Platform

- Development Well Drilling
- Platform Operations
- Workover and Well Stimulation

Platform Installation

- Steel Jacket Installation and Commissioning
- Concrete Platform Installation and Commissioning

Pipelaying and Burying

- Offshore Oil and Gas Gather Pipeline Laying and Burying
- Offshore Oil and Gas Trunk Pipeline Laying and Burying

Supply/Anchor/Tug Boat

- Supply/Anchor Boat for Rigs
- Supply Boat for Platform Development Drilling
- Supply/Anchor Boat for Lay Barge and Bury Barge
- Tugboat for Platform Installation and Towout
- Tugboat for Lay Barge Spread
- Supply Boat for Platform Operations

Source: Dames and Moore/Alaska Consultants, Inc. May 1979.

As in the Sale 60 OCS forecasts, an understanding of pertinent information in the petroleum scenarios such as the size and location of the offshore fields and a forecast of onshore activities such as the general location of facilities and a measure of the quantities and timing involved is necessary.

In regard to onshore impact on the Kenai-Cook Inlet coastal area and the communities of Homer, Kenai and Soldotna contained within the coastal area, the following information is required for each community on a yearly or, preferably, monthly basis:

- The OCS oil-related facilities to be located there, such as marine service bases, pipe coating plants, helicopter facilities and oil terminals.
- The operating employment in. these facilities during the exploration, development and production phases.
- The employment desired is onsite employment which disregards those workers rotated offsite. Onsite employment is used since workers engaged in onshore activities within the Kenai-Cook Inlet coastal area would not be rotated if they were resident in the coastal area. Thus, it can be assumed that all onshore employment rotated in this coastal area will leave the area upon rotation.

In regard to onshore impact on the Kenai-Cook Inlet coastal area as a result of employment offshore beyond this coastal area, the following information is required for this scenario in each community on an annual basis: -

- The survey vessel employment operating from specific ports performing geophysical and geological surveys.
- The supply/anchor/tug boat employment operating from specific ports during the exploration, development and production phases.
- The rig employment during the exploration phase.
- The platform installation and offshore pipeline employment during the development phase.
- The platform employment during the development and production phases.
- The offshore-onsite and the offshore-offsite employment for the above activit' es.

In order to process the emp" oyment data by the onshore and offshore categories mentioned, it is first necessary to aggregate onshore and offshore employment by task. The complete array of tasks developed by Dames and Moore is aggregated in Table A-2.

Since the data aggregated by category provides only employment by lease sale area, it is necessary to disaggregate the computer model by task, duration of employment, crew size and the number of shifts worked per day to allocate employment to onshore facilities. Also, assumptions must be made as to the offshore areas and activities serviced from the shore based facilities in communities within the lease sale area.

The jobs associated with offshore oil and gas development do not submit easily to the application of a general regional multiplier. There are extreme differences in employment sectors relating to petroleum development. For example, most construction employment of the magnitude associated with onshore petroleum development will reside in construction camps, work long hours (probably 12 hours per day) and be on the job continuously (7 days per week) until rotated for leave. Since most of these employees have a permanent residence outside the coastal community under study, most employees will spend their off duty hours outside this community while on leave. Thus, the impact on the local economy from this activity will be small.

On the other hand, transportation employees working at service bases will have considerably greater impact since these people will be year-round residents of the community. Thus, for purposes of estimating total employment in each of the communities for the scenario, a series of multiplier values is developed for each employment category.

A study of each employment category is then completed and employment assumptions which are reflected in the multiplier values are applied to each category. The assumptions reflected in the multiplier values for each employment category are listed in Table A-3.

With the direct OCS-related onshore-onsite employment calculated for each community for each year of the scenario, total employment is derived by applying the multiplier values (see Table A-4) to the direct (basic) employment in the task groups (see Table A-2) and totaling the product of the group. The total OCS onshore employment by location provides the

TABLE A-3

EMPLOYMENT ASSUMPTIONS REFLECTED IN MULTIPLIER VALUES
MEDIUM FIND SCENARIO - SALE CI
KENAI-COOK INLET COASTAL AREA

ONSHORE - WITHIN KENAI-COOK INLET COASTAL AREA

Service Base. With minor exceptions, while providing support to offshore platform installation and commissioning and pipelaying and burying, all service base employees working within the Kenai-Cook Inlet coastal area will be permanent employees resident in the Kenai-Cook Inlet coastal area.

Helicopter Service. During the exploration phase a number of the helicopter pilots, mechanics and operations personnel will be permanent residents of the Kenai-Cook Inlet coastal area, Oil activity in Cook Inlet during the past two decades has resulted in the development of a basic local helicopter service operation and work force. However, it is estimated that a portion of this work force will be rotated between the Kenai-Cook Inlet coastal area and employees' permanent residences outside this region. Although long-term employment in helicopter service will be assured with entry into the development phase, it is assumed that a portion of this work force required to meet the peak demands during the development phase will rotate out of the coastal area to their permanent residences. However, during the development phase the helicopter service work force is seen as permanent employees resident in the coastal area. For some employees this could involve an extended rotation pattern enabling the location of employees and their families in the Kenai-Cook Inlet coastal area.

Onshore Pipeline Construction. Onshore oil pipeline construction employees are assumed to be temporary employees housed in construction camps. These camps are assumed to contain a wide range of amenities for comfortable living. Thus, the excellent camps coupled with limited leisure time and scheduled rotation for employees are assumed to minimize impacts in the Kenai-Cook Inlet coastal area.

Pipe Coating. Employees engaged in the coating of pipe for emplacement offshore are assumed to be temporary employees housed in a construction camp with periodic rotation outside the Kenai-Cook Inlet coastal area to their permanent places of residence. These construction employees will be housed in small construction camps offering reasonable amenities. Therefore, although their impact within the Kenai-Cook Inlet coastal area will be limited, it is assumed that the per construction employee impact will be greater than a major construction project such as onshore pipeline.

OFFSHORE

Survey. Offshore crews of vessels engaged in geophysical and geological surveying are assumed to be composed of transient workers. These vessels will travel into the Lower Cook Inlet Sale CI lease sale area during a portion of the year to carry out their investigations. No offshore survey employees are assumed to be employed or to be resident in the Kenai-Cook Inlet coastal area despite their activities on the Outer Continental Shelf beyond the coastal area and occasional visits to service bases. Therefore, the direct and indirect impact of this employment upon the coastal area is assumed to be negligible.

Rigs. Offshore rig crews engaged in exploration drilling are assumed to be compased for the most part of transient workers who are rotated through the Kenai-Cook Inlet coastal area. Only a small percentage (10 percent) of the offshore rig employment is assumed to be resident in the coastal area. Therefore, the direct and indirect impact of rig employees upon the Kenai-Cook Inlet coastal area is assumed to be reasonably small.

Platforms. Although a large part of offshore employment during the development phase is assumed to be composed of transient workers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area, it is assumed 30 percent of those employees engaged in development drilling will elect to reside within the Kenai-Cook Inlet coastal area.

During the production phase, it is estimated that approximately 70 percent of those employees engaged in platform operations will elect to reside in the coastal area.

Therefore, there will be a substantial direct and indirect impact in the Kenai-Cook Inlet coastal area based upon those employees electing to reside there. The impact of the remaining transient employees is deemed to be negligible.

Supply/Anchor/Tug Boats. During the exploration phase offshore boat crews are assumed to be in large part composed of transient workers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area. It is assumed that only 20 percent of the total boat crew employment will reside in the coastal area. During the development phase, a greater percentage of the total boat crew employment (30 percent) will be composed of employees resident in the Kenai-Cook Inlet coastal area, while during the production phase the great majority (80 percent) are assumed to reside in the Kenai-Cook Inlet coastal area. Therefore, there will be a direct and indirect impact in the coastal area based upon the employees electing to reside there. The impact of the remaining transient employees is deemed to be negligible.

'<u>Platform Installation and Offshore Pipeline Construction</u>. The offshore crews engaged in platform installation and pipeline construction which takes place during the development phase are assumed to be largely transient workers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area. A small number of offshore platform installation and pipeline construction employees (10 percent) are assumed to be employed or be resident within the Kenai-Cook Inlet coastal area. Therefore, the direct and indirect of these offshore activities upon the coastal area is assumed to be relatively small.

Source: Alaska Consultants, Inc. June 1979.

basis for the onshore OCS-related population within the area of location. Onshore employees are assumed to reside within the Kenai-Soldotna area or the Homer area depending upon the location of onshore facilities.

On the other hand, the necessity of rotating offshore OCS emp" oyees provides these employees with a greater latitude in the locat· on of their permanent residences. Within limits, the principal requirement for the ultimate location of these employees is an airport. During the exploration phase it is assumed that most offshore employment will be provided from outside the Kenai-Cook Inlet Census Division or, conversely, the number of employees resident in the area of study will be proportionally low. However, resident employment is assumed to increase during the development phase and during the production phase most offshore OCS employment is assumed to be resident in the Kenai-Cook Inlet Census Division (see Table A-4). Within the Kenai-Cook Inlet Census Division, it is assumed that half of the offshore OCS employees will elect to reside in the Southern Peninsula Area (Homer area) and half in the Central Peninsula Area (Kenai-Soldotna area).

Thus, total offshore OCS employment derived by multiplying each task group by its rotation factor is multiplied by the percentage assumed to reside within the Kenai-Cook Inlet Census Division. The total number of direct offshore OCS employees assumed to reside within the study area is then apportioned with one half assumed to reside in the Homer area and one half assumed to reside in the Kenai-Soldotna area. The multiplier (see Table A-4) which is common to all direct offshore OCS employment is

TABLE A-4

EMPLOYMENT MULTIPLIER VALUES FOR THE KENAI-COOK
INLET COASTAL AREA a/
MEDIUM FIND SCENARIO - SALE CI

ONSHORE (Applied to onshore-onsite employees in the Coastal Area) b/

Service Base	1.50
Helicopter Service - Exploration	1.10
Development	1.20
Production	1.50
Onshore Pipeline Construction	1.10
Pipe Coating	1.10

OFFSHORE (Applied to offshore employees assumed to be resident in the Coastal Area) c/

Survey	(Nil)	
Rigs	(10%)	1.50
Platforms - Development Drilling	(30%)	1.50
Operations	(70%)	1.50
Supply/Anchor/Tug Boats - Exploration	(20%)	1.50
Development	(30%)	1.50
Production	(80%)	1.50
Platform Installation	(10%)	1.50
Offshore Pipeline Construction	(10%)	1.50

a/ The coastal area is assumed to be the Kenai-Cook Inlet Labor Area.

b/ The employment multiplier values are applied to the direct onshore-onsite employment in the coastal area.

c/ The employment multiplier values are applied only to the estimated portion of total offshore employment resident in the Kenai-Cook Inlet coastal area.

Source: Alaska Consultants, Inc. June 1979.

applied to total direct offshore employment assumed to reside in either the Homer area or the Kenai-Soldotna area to derive total offshore OCS-related employment in these areas.

The OCS-related employees in terms of dependent family members and unrelated individuals are assumed to exhibit a dependency ratio closer to national averages rather then the high dependency ratio of the Kenai-Cook Inlet Census Division. Therefore, a dependency ratio of 2.5 persons per employee is assumed for all OCS-related employees. Thus, the dependency ratio is applied to total onshore OCS-related employment by area and total offshore OCS-related employment by area to produce total OCS-related population in the Homer and Kenai-Soldotna areas.

Forecast of an Additional North Kenai LNG Facility Employment and Population

Since the gas processing capacity of an additional North Kenai LNG facility is assumed as part of the total capacity available for the processing of natural gas critical to the OCS high find scenario, a scenario is developed for its inclusion in the base case. Although the construction of this facility is not premised upon Sale 60 OCS finds, it is assumed that by the time Sale 60 OCS gas is produced, enough capacity will exist among the North Kenai plants to process the gas without further major additions in plant capacity. This particular plant proposed by Pacific Alaska LNG Company is assumed to have a capacity of 400 million cubic feet per day.

The plant is seen utilizing gas reserves from existing fields which are shut in and from future onshore and offshore fields brought into production by more intensive exploration and development in the Cook Inlet area as well as possible Sale CI purchases. Since it is assumed that the supply of natural gas to this facility is not dependent upon major finds of the Pacific Alaska LNG Company' s making, the offshore and onshore employment which would be included in developing the major reserves or transporting them to the plant are not ncluded in this scenario. The employment forecast to be required in making gas available for this plant is included as a part of the non-OCS employment forecast where onshore and offshore reserves of upper Cook Inlet are utilized or OCS employment in the case of Sale CI.

The timing and direct employment required in the construction and operation of this facility were obtained from the Institute of Social and Economic Research, University of Alaska. These were used by ISER in the Lower Cook Inlet State-wide and Regional Population and Economic Projections.

Construction is forecast to begin during 1980 and conclude with a finished plant during 1983. The following direct onshore construction employment and schedule is assumed:

1980	146
1981	844
1982	1,323
1983	400

Production is assumed to begin in 1984 and continue through the life of the forecast period. This activity is assumed to directly employ an average of 60 persons per year in onshore LNG plant operations. No other direct employment is included in this scenario.

The impacts in the North Kenai LNG facility scenario are assumed to affect the Kenai-Soldotna area only. Thus, population increases are seen occuring in the City of Kenai, City of Soldotna, and the remaining areas outside these cities.

The direct construction workforce is seen to be composed almost exclusively of transient workers who are rotated through the Kenai-Cook Inlet Census Division to their permanent residences outside this area. Furthermore, these employees are assumed to reside in a construction camp on the site of the LNG plant. Such a camp is seen to contain 'a wide range of amenities for comfortable living and this, coupled with limited leisure time and scheduled rotation for employees, is assumed to minimize impacts in the Kenai-Soldotna area. Thus, a low multiplier of 1.10 is assumed during the construction of the North Kenai LNG plant.

On the other hand, all of the LNG plant operations employees are assumed to be permanent employees whole permanent residences are reasoned to be close to the plant. Therefore, all LNG plant operations employees are forecast to 'live within the Kenai-Soldotna area. Since these employees are provided long-term, stable employment, the multiplier is assumed to be 1.50.

The multiplier values are then applied to each employment category to produce total employment for each category. The sum of the total employment for each category equals total employment (basic and secondary employment for all categories). Total employment minus basic employment provides secondary employment.

As in the other cases, total population is derived by the application of a dependency ratio. It is assumed that the dependency ratio for this North Kenai LNG plant scenario will be similar to the ratio in the petroleum related OCS Sale CI scenario since the employees are assumed to be largely oil industry related employees who will migrate to the area from outside the Kenai-Cook Inlet Census Division. Thus, a ratio of 2.5 persons per employee is assumed rather than the existing Kenai-Cook Inlet Census Division ratio of 3.0 persons per employee. This ratio is applied to all permanent employment. Where direct onshore construction employment is involved, this is added to the population without application of the dependency ratio.

The resulting population is forecast to reside only in the Kenai-Soldotna area. Population is also assumed to be distributed on an historical basis as the Sale CI distribution with the City of Kenai receiving 30 percent, the City of Soldotna 20 percent and the remaining area outside these two incorporated cities, 50 percent. However, the population (direct employent) living at the LNG plant construction camp site is assigned to North Kenai or the remaining area outside the cities of Kenai and Soldotna.

Base Case Population Forecast

The base case population forecast for the Kenai-Cook Inlet Census Division is derived by adding the non-OCS population estimate in a given year to the Sale CI offshore OCS-related, Sale CI onshore OCS-related and LNG facility related populations in the same year. Similarly, the base case population for the Kenai-Soldotna area is derived by adding the non-OCS population estimates in a given year to the Sale CI offshore OCS-related, Sale CI onshore OCS-related and LNG facility related populations in the same year. Since the resident population associated with the North Kenai LNG facility is assumed to be located in the Kenai-Soldotna area, the base case population for Homer is derived by adding the non-OCS population estimates in a given year to the Sale CI offshore OCS-related and Sale CI onshore OCS related population in the same year. The populations allocated in the Kenai-Soldotna area to the City of Kenai, City of Soldotna and the remaining Kenai-Soldotna area and in the Homer area to the City of Homer and the remaining Homer area are derived in a similar manner.

Forecast of OCS Lease Sale 60 Employment and Population

The OCS petroleum scenarios (or cases) which form the basis of the socioeconomic impact assessment were selected by the U.S. Bureau of Land Management and developed by Dames and Moore from U.S. Geological Survey resource estimates. The cases are as follows:

- High Find Scenario
- Medium Find Scenario

- Exploration Only Scenario

Although resonably precise locations, quantities, methods of operation, facilities and time frames are necessary to the development of plausible scenarios, the scenarios and their impacts should not be interpreted as forecasts of what is actually going to happen. As in the forecast for Sale CI, there is far too much uncertainty in oil and gas exploration and development for this type of precision. However, an indication is given of the type and scale of activities which could impact Lower Cook Inlet communities and the extent to which individual communities would logically be impacted.

An understanding of pertinent information in the petroleum scenarios such as the size and location of the offshore fields and a forecast of onshore activities such as the general location of facilities and a measure of the quantities and timing involved are imperative.

In regard to onshore impact on the Kenai-Cook Inlet coastal area and the communities of Homer, Kenai and Soldotna contained within the coastal area, the following information is required for each community on a yearly or, preferably monthly basis:

- The OCS oil related facilities to be located there, such as marine service bases, pipe coating plants, helicopter facilities and oil terminals.
- The employment required to construct these facilities.
- The operating employment in these facilities during the exploration, development and production phases.

- The employment desired is onsite employment which disregards those workers rotated offsite. Onsite employment is used since workers engaged in onshore activities within the Kenai-Cook Inlet coastal area would not be rotated if they were resident in the coastal area. Thus, it can be assumed that all onshore employment rotated in this coastal area will leave the area upon rotation.

In regard to onshore impact on the Kenai-Cook Inlet coastal area as a result of onshore employment located outside the Kenai-Cook Inlet coastal area, the following information is required for each scenario on an annual basis:

- The oil related facilities to be located there, such as marine service bases and oil terminals.
- The employment required to construct these facilities.
- The operating employment in these facilities during the phases operated.
- The employment desired is total employment which includes onsite employment and offsite employment. Total employment is used in this case since no workers are assumed to be resident in the Lower Cook Inlet and Shelikof Strait lease sale area outside the Kenai-Cook Inlet coastal area. Also, all workers are assumed to be initially rotated to a point within the Kenai-Cook Inlet coastal area.

In regard to onshore impact on the Kenai-Cook Inlet coastal area as a result of employment offshore beyond this coastal area, the following information is required for each scenario in each community on an annual basis:

- Survey vessel employment operating from specific ports performing geophysical and geological surveys.
- Supply/anchor/tug boat employment operating from specific ports during the exploration, development and production phases.
- Rig employment during the exploration phase.
- Platform installation and offshore pipeline employment during the development phase.
- Platform employment during the development and production phases.
- Offshore-onsite and the offshore-offsite employment for the above activities.

In order to process employment data by the onshore and offshore categories mentioned, it is first necessary to aggregate onshore and offshore employment by task. The complete array of tasks developed by Dames and Moore is aggregated in Table A-2.

Since the data aggregated by category provides only employment by lease sale area for each scenario, it is necessary to disaggregate the computer model by task, duration of employment, crew size and the number of shifts worked per day to allocate employment to onshore facilities. In the case of construction employment and operating employment in LNG plants and oil terminals, scaling factors developed for the model must be employed. Also, assumptions must be made as to the offshore areas and activities serviced from the shore based facilities in communities within each lease sale area for each scenario.

A simple example from the exploration only scenario developed by Dames and Moore is provided for onsite employment at service bases during year 1 of the scenario or 1982 as follows: (All references to page or table numbers refer to Alaska OCS Socioeconomic Studies Program, Lower Cook Inlet and Shelikof Strait Lease Sale No. 60, Petroleum Development Scenarios, Dames and Moore, March 1979).

Step 1. Identify onshore manpower requirements.

Refer to Table 4-4, p. 68

Step 2. Select activity 1 and identify.

Refer to List of Tables, Table 4-4 (Attachment), p. 69.

Activity 1 - Service Bases.

Step 3. Convert yearly manpower requirements by activity onsite from man months to man years.

Refer to Table 4-4, p. 68. Year 1 (1982), Activity 1 (Service Bases).

Divide man months by 12. $303 \div 12 = 25$ man years.

Step 4. Investigate assumed locations of service bases.

Refer to p. 65.

Principal service base at Nikiski (Kenai-Soldotna area).

Advance service base at Homer (Homer area).

step 5. Make assumptions as to the type of activity and the amount of activity that will take place at each facility.

Assumed for Homer: all survey vessel support, one-third rig support.

Assumed for Nikiski: two-thirds rig support.

Note: Rig support includes support for supply/anchor vessels attending rigs.

Step 6. Determine onshore-onsite employment by task at service bases during exploration.

Refer to Appendix D-16, Table 4.

6 onshore-onsite employees directly supporting a rig.

2 onshore-onsite employees directly supporting an supply/anchor boat.

2 onshore-onsite employees directly supporting a survey vessel.

Step 7. Investigate footnote regarding unit of analysis for use in the calculation of employment by task for survey vessels since these must be allocated exclusively to the Homer area.

Refer to footnote 2, Appendix 18.

Indicates scenario specific values are employed. Also, "Additional notes on next page."

Refer to p. 70 not next page. Check Task 2.

Approximately 1 month of geophysical work per well.

2 onshore-onsite at service base.

Step 8. Determine the number of exploration wells.

Refer to Table 4-1, p. 64.

7 wells drilled during year 1 (1982).

Step 9. Determine the amount of survey vessel work.

Refer to Table 4-1, p. 64.

1 month per well x 7 wells drilled = 7 months survey vessel work.

Step 10. Calculate employment based upon a 12 month year.

7/12 x 2 = 1.167 or 1 service vessel support employee at Homer service base.

Step 11. Allocate remaining service base employees.

24 x 2/3 = 16 Total service base employment at Nikiski.

24x 1/3= 8 Employment support for rigs and supply/anchor boats at Homer.

Step 12. Calculate total service base employment.

8 + 1 = 9 Total service base employment at Homer

16 Total service base employment at Nikiski.

25 Total service base employment for exploration only scenario Sale 60 during year 1 (1982).

As in Sale CI, the jobs associated with offshore oil and gas development in Sale 60 do not submit easily to the application of a general regional multiplier. There are extreme differences in employment sectors relating to petroleum development. Thus, for purposes of estimating total employment in the Kenai-Soldotna and Homer area for each of the scenarios, a series of multiplier values is developed for each employment category.

A study of each employment category is then completed and employment assumptions which are reflected in the multiplier values are applied to each category. The assumptions reflected in the multiplier values for these employment categories are listed in Table A-5.

With the direct OCS-related onshore-onsite employment within the Kenai-Cook Inlet coastal area calculated for the Kenai-Soldotna area and the Homer area for each year of the scenario, total employment (basic and secondary) is derived by applying the multiplier values (see Table A-6) to the direct (basic) employment derived in the task groups (see Table A-2) and totaling the product of the group. The total OCS onshore employment by location provides the basis for the onshore OCS-related population within the area of onshore facilities location. Onshore employees within the Kenai-Cook Inlet coastal area are assumed to reside within the Kenai-Soldotna area or the Homer area depending upon the location of onshore facilities.

On the other hand, the necessity of rotating offshore OCS employees and onshore OCS employees located outside the Kenai-Cook Inlet coastal area such as those on Afognak Island, provides these employees with greater latitude in the location of their permanent residences. Within limits, the principal requirement for the ultimate location of these employees is an airport. For purposes of clarity, the onshore OCS employees located outside the Kenai-Cook Inlet coastal area are assumed as a part of the offshore OCS employment since the process of deriving and distributing employment is identical.

TABLE A-5

EMPLOYMENT ASSUMPTIONS REFLECTED IN MULTIPLIER VALUES
KENAI-COOK INLET COASTAL AREA
LOWER COOK INLET - SALE 60

ONSHORE - WITHIN KENAI-COOK INLET COASTAL AREA

Service Base. With minor exceptions, while providing support to offshore platform installation and commissioning and pipelaying and burying, all service base employees working within the Kenai-Cook Inlet coastal area will be permanent employees resident in the Kenai-Cook Inlet coastal area.

Helicopter Service. During the exploration phase a number of the helicopter pilots, mechanics and operations personnel will be permanent residents of the Kenai-Cook Inlet coastal area. Oil activity in Cook Inlet during the past two decades has resulted in the development of a basic local helicopter service operation and work force. However, it is estimated that a portion of this work force will be rotated between the Kenai-Cook Inlet coastal area and employees' permanent residences outside this region. Although long-term employment in helicopter service will be assured with entry into the development phase, it is assumed that a portion of this work force required to meet the peak demands during the development phase will rotate out of the coastal area to their permanent residences. However, during the development phase the helicopter service work force is seen as permanent employees resident in the coastal area. For some employees this could involve an extended rotation pattern enabling the location of employees and their families in the Kenai-Cook Inlet coastal area.

Onshore Pipeline Construction. Onshore oil pipeline construction employees are assumed to be temporary employees housed in construction camps. These camps are assumed to contain a wide range of amenities for comfortable living. Thus, the excellent camps coupled with limited leisure time and scheduled rotation for employees are assumed to minimize impacts in the Kenai-Cook Inlet coastal area.

Pipe Coating. Employees engaged in the coating of pipe for emplacement offshore are assumed to be temporary employees housed in a construction camp with periodic rotation outside the Kenai-Cook Inlet coastal area to their permanent places of residence. These construction employees will be housed in small construction camps offering reasonable amenities. Therefore, although their impact within the Kenai-Cook Inlet coastal area will be limited, it is assumed that the per construction employee impact will be greater than a major construction project such as onshore pipeline.

ONSHORE - OUTSIDE THE KENAI-COOK INLET COASTAL AREA

Service Base. A large proportion of the service base employees located at the Afognak Island service base will be permanent residents in the Kenai-Cook Inlet coastal area. These employees will be rotated from or through the Kenai-Cook Inlet coastal area to the service base site on Afognak Island.

Service Base Construction. Employees engaged in service base construction on Afognak Island are assumed to be temporary employees housed in a construction camp with periodic rotation mostly through the Kenai-Cook Inlet coastal area to their permanent places of residence. Therefore, the impact upon the Kenai-Cook Inlet coastal area will be limited.

Oil Terminal and Onshore Pipeline Construction. Onshore oil pipeline construction will take place in conjunction with oil terminal construction of Afognak Island. Also, since the onshore oil pipeline which terminates at the oil terminal is accessible from the oil terminal construction camp, pipeline construction employees will be considered with oil terminal construction employment and reside in the oil terminal site construction camp.

The employees engaged in these construction activities on Afognak Island are assumed to be temporary employees who are periodically rotated mostly through the Kenai-Cook Inlet coastal area to their permanent places of residence. Therefore, the impact upon the Kenai-Cook Inlet coastal area will be limited.

Oil Terminal Operations. A large portion of the oil terminal employees located at the Afognak Island oil terminal will be permanent residents of the Kenai-Cook Inlet coastal area. These employees will be rotated from or through the Kenai-Cook Inlet coastal area to the oil terminal site on Afognak Island.

OFFSHORE

Survey. Offshore crews of vessels engaged in geophysical and geological surveying are assumed to be composed of transient workers. These vessels will travel into the Lower Cook Inlet Sale CI lease sale area during a portion of the year to carry out their investigations. No offshore survey employees are assumed to be employed or to be resident in the Kenai-Cook Inlet coastal area despite their activities on the Outer Continental Shelf beyond the coastal area and occasional visits to service bases. Therefore, the direct and indirect impact of this employment upon the coastal area is assumed to be negligible.

Rigs. Offshore rig crews engaged in exploration drilling are assumed to be composed for the most part of transient workers who are rotated through the Kenai-Cook Inlet coastal area. Only a small percentage (10 percent) of the offshore rig employment is assumed to be resident in the coastal area. Therefore, the direct and indirect impact of rig employees upon the Kenai-Cook Inlet coastal area is assumed to be reasonably small.

Platforms. Although a large part of offshore employment during the development phase is assumed to be composed of transient wor ers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area, it is assumed 30 percent of those employees engaged in development drilling w 11 elect to reside within the Kenai-Cook Inlet coastal area.

During the production phase, it is estimated that approximate ly 70 percent of those employees engaged in platform operations will elect to reside in the coastal area.

Therefore, there will be a substantial direct and indirect impact in the Kenai-Cook Inlet coastal area based upon those employees electing to reside there. The impact of the" remaining transient employees is deemed to be negligible.

Supply/Anchor/Tug Boats. During the exploration phase offshore boat crews are assumed to be in large part composed of transient workers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area. It is assumed that only 20 percent of the total boat crew employment will reside in the coastal area. During the development phase, a greater percentage of the total boat crew employment (30 percent) will be composed of employees resident in the Kenai-Cook Inlet coastal area, while during the production phase the great majority (80 percent) are assumed to reside in the Kenai-Cook Inlet coastal area. Therefore, there will be a direct and indirect impact in the coastal area based upon the employees electing to reside there. The impact of the remaining transient employees is deemed to be negligible.

Platform Installation and Offshore Pipeline Construction. The offshore crews engaged in platform installation and pipeline construction which takes place during the development phase are assumed to be largely transient workers who are rotated through the Kenai-Cook Inlet coastal area to their permanent residences outside the coastal area. A small number of offshore platform installation and pipeline construction employees (10 percent) are assumed to be employed or be resident within the Kenai-Cook Inlet coastal area. Therefore, the direct and indirect of these offshore activities upon the coastal area is assumed to be relatively small.

Source: Alaska Consultants, Inc. June 1979.

During the exploration phase, it is assumed that most offshore employment will be provided from outside the Kenai-Cook Inlet Census Division or, conversely, the number of employees resident in the area of study will be proportionally low. However, resident employment is assumed to increase during the development phase and, during the production phase, most offshore OCS employment is assumed to be resident in the Kenai-Cook Inlet Census Division (see Table A-6). Within the Kenai-Cook Inlet Census Division, it is assumed that half of the offshore OCS employees will elect to reside in the Southern Peninsula Area (Homer area) and half in the Central Peninsula Area (Kenai-Soldotna area).

Thus, total direct offshore OCS employment derived by multiplying each task group by its rotation factor is multiplied by the percentage assumed to reside within the Kenai-Cook Inlet Census Division. The total number of direct offshore OCS employees assumed to reside within the study area is then apportioned with one half assumed to reside in the Homer area and one half assumed to reside in the Kenai-Soldotna area. The multiplier (see Table A-6) which is common to all direct offshore OCS employment is applied to total direct offshore employment assumed to reside in either the Homer or Kenai-Soldotna areas to derive total offshore OCS-related employment in these areas.

The OCS-related employees in terms of dependent family members and unrelated individuals are assumed to exhibit a dependency ratio closer to national averages rather then the high dependency ratio of the Kenai-Cook Inlet Census Division. Therefore, a dependency ratio of 2.5

TABLE A-6

EMPLOYMENT MULTIPLIER VALUES FOR THE KENAI-COOK INLET COASTAL AREA a/
LOWER COOK INLET - SALE 60

ONSHORE (Applied to onshore-onsite employees in the Coastal Area) b/

Service Base	1.50
Helicopter Service - Exploration	1.10
Development	1.20
Production	1.50
Onshore Pipeline Construction	1.10
Pipe Coating	1.10

ONSHORE - OUTSIDE THE KENAI-COOK INLET COASTAL AREA (Applied to offshore employees assumed to be resident in the Coastal Area) c/

Service Base	(80%)	1.50
Service Base Construction	(lo%)	1.50
Onshore Pipeline Construction	(5%)	1.50
Oil Terminal Construction	(5%)	1.50
Oil Terminal Operations	(80%)	1.50

OFFSHORE (Applied to offshore employees assumed to be resident in the Coastal Area) d/

Survey	(Nil)	
Rigs	(10%)	1.50
Platforms - Development Drilling	(30%)	1.50
Operations	(70%)	1.50
Supply/Anchor/Tug Boats - Exploration	(20%)	1.50
Development	(30%)	1.50
Production	(80%)	1.50
Platform Installation	(lo%)	1.50
Offshore Pipeline Construction	(10%)	1.50

a/ The coastal area is assumed to be the Kenai-Cook Inlet Labor Area. This area does not include any portion of the Lower Cook Inlet and Shelikof Strait OCS lease sale area (Sale 60) which is in Federal waters.

b/ The employment multiplier values are applied to the direct onshore-onsite employment in the coastal area.

c/ The employment multiplier values are applied only to the estimated portion of total onshore employment outside the Kenai-Cook Inlet coastal area which is resident in the Kenai-Cook Inlet coastal area.

d/ The employment multiplier values are applied only to the estimated portion of total offshore employment resident in the Kenai-Cook Inlet coastal area.

Source: Alaska Consultants, Inc. June 1979.

persons per employee is assumed for all OCS-related employees. The dependency ratio is applied to total employment resulting from offshore OCS activities in the Kenai-Soldotna and the Homer areas to obtain population added here as a result of offshore OCS activities. The same ratio is applied to all permanent employment resulting from onshore OCS activities within the Kenai-Soldotna area and the Homer area. However, where direct onshore construction employment is involved, this population (direct employment) is added without application of the dependency ratio.

The allocation of population is closely tied to historical distribution patterns. In the Kenai-Soldotna area 30 percent is allocated to the City of Kenai, 20 percent to the City of Soldotna and 50 percent to the remaining area outside these incorporated cities. In the Homer area, 50 percent is allocated to the City of Homer and 50 percent to the remaining area. However, the population (direct employment) at construction camp sites is not distributed but rather assigned to the area within which the site is located.

The population for the various lease Sale 60 scenarios is then added to . the base case in the forecast years of 1982 - 2000 to produce forecasts of population which include Sale 60 OCS activity during the exploration only scenario, medium find scenario and high find scenario.

The extent of the impact upon the Kenai-Cook Inlet Census Division and the cities of Kenai, Homer and Soldotna is then elicited by comparing the base case forecasts of population with the population forecasts which include the OCS Sale 60 cases.

LAND

The major uses of land required in the existing communities under study as a result of growth are lands in public (principally rights-of-way, parks and recreation areas), industrial and residential"l uses. The future demand for other public, commercial and semi-public land uses will be comparatively minor.

In the communities where land. uses have recently been quantified, land availability and suitability will be equated against estimates of future total land use requirements. In communities where existing land use has not already been quantified, rough estimates will be developed for land capability and the lands required to be added in major public, industrial and residential uses. Minor public, commercial and semi-public uses are estimated as a percentage of the lands in residential and industrial use where relevant, based upon land uses in communities of comparable size and industrial mix.

In forecasting the use of residential land, the following factors are assumed:

- The new residents forecast will desire to reside within the cities of Kenai, Homer and Soldotna or within the unincorporated areas around these communities.

- The types of housing desired by the new population will approximate current usage in the communities under study.
- Although some **infilling** may occur, most development will occur on virgin land or on land suitable for residential development of size.
- The development or redevelopment of the land **will** adhere roughly to present standards established in zoning ordinances for the respective communities.
- It is assumed that the development of raw land and the redevelopment of land for residential purposes will result in approximately 28 percent of the gross land area being devoted to street rights-of-way (Simpson, Usher, Jones, Inc., June 1977).
- An average right-of-way width will be established based upon current standards in the zoning ordinances applicable to the respective communities.
- The lineal footage of sewer and water lines is roughly equivalent to the lineal footage of the street rights-of-way. (Simpson, Usher, Jones, Inc., June 1977).

To estimate the amount of land required for residential use in the future, a density of development for one and two family units, multifamily units and mobile homes must be derived from the zoning ordinances applicable to each **community.**

Using .4 hectares or 1 acre of land as a common measure, 28 percent (1,333.1 square meters or 12,197 square feet) would be in rights-of-way. Thus, the remaining 72 percent (2,913.6 square meters or 31,363 square feet) would be available for residential use.

The method of calculating the amount of land required is as follows:

- One acre minus 28 percent in street rights-of-way provides the developable land per acre.
- The developable land per acre divided by the minimum lot size allowable as per the locally applicable zoning ordinance provides the number of lots per acre allowable.
- The number of lots allowable times the maximum allowable housing units per lot provides the number of housing units which can be accommodated on an acre.
- The number of housing units forecast to be added divided by the maximum allowable housing units per acre provides the number of acres required to accommodate the housing units and street rights-of-way forecast to be added throughout the planning period.
- The number of acres required multiplied by 72 percent provides a gross forecast of residential land required to accommodate the housing units forecast to be added.
- The number of acres required multiplied by 28 percent provides a gross forecast of lands needed for street rights-of-way.

Once the land requirements for one and two family, multifamily and mobile homes have been determined, these quantities are aggregated to produce a gross forecast of residential and street rights-of-way land needs.

The remaining uses which place heavy demands upon a community are public lands in park and recreation use and industrial lands. Major industrial land requirements will be estimated based upon the Impact Analysis of the Fishing Industry by the University of Alaska's Sea Grant Program and the Petroleum Development Scenarios prepared by Dames and Moore. The future requirements forparks and recreation lands are specified in the recreation standards elsewhere in this appendix.

The total of lands in the major public uses of parks, recreation and street rights-of-way plus the land requirements for housing and industrial uses and, to a lesser extent, minor public, commercial and semi-public uses are used to assess the pressures on developable land within the communities under study.

HOUSING

A distinction is made in the forecast of populations to be housed onshore in the future. Total forecast population is divided into households (i.e. a mix of family and unrelated individual households) and those living in group quarters (i.e. the number of people living in bunkhouses, construction camps, military compounds and other group circumstances). The population forecast to be living in households is divided by the estimated family size (the average number of persons per unit) to produce the total number of housing units forecast to satisfy household demands. A subtraction of units in the base year from units forecast in a succeeding year produces the yearly requirement of new housing units.

The number of structures is of little relevance in group housing. The building of group housing is generally assumed by the employer and is most often modular construction. Therefore, group housing is shown as. places for persons which is equivalent to group housing population. A subtraction of the number of persons in group housing in the base year from the number of persons forecast to be living in group housing the succeeding year produces the yearly requirement for new places to be provided in group housing.

Group housing has resulted in large part from the seasonality inherent in the past exploitation of fishery resources. However, recent trends in the fishing and fish processing industry have been toward a year-round fishery. The fishing industry which processed essentially only salmon during the summer season has since added king crab, tanner crab and other fisheries products resulting in fishing and fish processing being a more yearround enterprise. It is assumed that the addition of bottomfish will serve further to abate the seasonality in this industry since it is essentially a yearround fishery requiring a permanent year-round resident labor force. Thus, it is assumed that with reduced seasonal variations in the demand for labor, increased group quarters of a permanent nature will not be needed or desired in the non-OCS case.

In order to obtain an indication of land requirements, the number of housing units forecast are estimated as to one and two family units, multifamily units and mobile homes. It is assumed that the relative proportion as measured in the most recent inventory or estimate on types of housing units for a given community will be maintained throughout the planning period.

The forecast of housing to accommodate persons added as a result of OCS oil and gas activities will utilize the same methodology employed for the non-OCS case. However, an important assumption in the OCS cases is that the construction employees engaged in building or fabricating major OCS facilities onshore will be housed onsite in construction camps throughout the period of construction.

COMMUNITY FACILITIES AND SERVICES

A series of assumptions has been made and standards developed for assessing future needs for a range of community facilities and services in the communities under study in both the non-OCS and OCS cases. These assumptions and standards and the methodology employed in forecasting are contained in the following pages.

Public Safety

Police. The following basic assumptions have been made for police protection:

- Police protection services will continue to be provided by the cities of Kenai, Homer and Soldotna for areas within their corporate limits.
- Law enforcement in the road-connected areas outside these communities will continue to be provided by State troopers.

To arrive at reasonable standards for police protection, commonly used nationwide standards for the number of law enforcement officers and jail cells needed to serve a given number of people were obtained. These standards were then reviewed in relation to existing conditions in the communities under study and special situations in the communities were noted.

Nationwide, the desired ratio of law enforcement officers to population is one for every 500 people: According to the Alaska Department of Public Safety, when a community reaches a size where it becomes desirable to have an officer on duty 24 hours per day, 7 days per week, a minimum of 6 officers (mathematically, 5.75) must be hired when factors such as annual leave, sick leave and others are taken into account. A similar situation exists with support personnel.

According to the Alaska Department of Public Safety, a commonly used standard for jail cells is one for every 500 people. However, since State law requires that male, female and juvenile offenders be separated during incarceration, a minimum sized jail in Alaska should have at least three cells.

A review of existing jail conditions in the under study indicates that Kenai, Homer and Soldotna exceed national standards, while Soldotna, which does not maintain its own jail facility, has the use of Kenai's jail, as needed. Kenai, Homer and Soldotna have more police officers than would ordinarily be considered necessary. Additional officers are needed to provide police protection services to these communities' large transient populations composed in large part of summer tourists and transient fishing boat crews. Nevertheless, despite the larger than normal complement of police personnel in these communities, the number of jail cells provided is generally consistent with national standards.

On the basis of the foregoing, the following standards were derived for policemen and jail cells in the non-OCS case:

- The existing relationships between population and the number of police officers in the cities of Kenai, Homer and Soldotna is assumed as the base from which forecasts are made with an additional officer to be required for each successive growth of 500 population.
- One jail cell for every 500 people.

In the various OCS" cases, offshore personnel are assumed not to have a significant impact on local law enforcement requirements as it is assumed that these people will be shuttled directly in and out of the region with essentially no layover time. However, all onshore personnel, including construction crews in camps, are assumed to have an impact on local protection capabilities comparable to the non-OCS case, i.e. one additional officer and one additional jail cell for each successive growth of 500 persons.

Fire Protection. Fire protection is a normal responsibility of Alaska cities and one which is exercised by the communities under study. In addition, unincorporated areas may form volunteer fire departments while, if they are within organized boroughs, they may elect to have this service provided by the borough on a service area basis. The cities of Kenai, Homer and Soldotna have their own fire protection capabilities and the unincorporated North Kenai has established a volunteer fire department.

The State has no established qualitative fire protection standards except that an individual fire department must be registered with the Division of Fire Prevention to be eligible to receive State revenue sharing funds for firefighting purposes. However, the Insurance Services Office, on behalf of fire insurance companies and as an aid to the underwriting of fire insurance premiums, publishes comprehensive fire protection guidelines to enable the classification of communities throughout the United States in relation to the adequacy of their fire defenses and their physical characteristics. Based upon the extent to which local fire departments meet these standards, individual communities are graded on a class 1 (best) to a class 10 (worst) scale and local insurance rates are adjusted to reflect these differences in fire protection capability. Present ratings for the communities under study range from 6 to 9 within the City of Kenai, and from 6 to 7 within Soldotna, depending upon whether the local area is served by hydrants. The City of Homer's rating is 7.

According to the Insurance Services Office, the minimum criteria for a recognized fire department are as follows:

- Organization: The department shall be organized on a sound, permanent basis under applicable state and/or local laws. The organization shall include one person (usually with the title of Chief) responsible for the operation of the department.
- Membership: The department shall have an active membership which provides a response of at least 4 members to alarms.
- Training: Training shall be conducted for all active members.
- Apparatus: Response to any alarm or fire shall be with at least one piece of apparatus suitably designed and equipped for fire service. Provisions shall be made for the housing and maintenance of apparatus.
- Alarm Notification: Means shall be provided for 24-hour receipt of alarms and immediate notification of members.

In, addition to minimum criteria for fire departments, the Insurance Services Office also establishes minimum criteria for water supplies for firefighting purposes, quoted as follows:

> "A minimum recognized water supply usually contemplates a network of mains and hydrants capable of delivering at least [15.77 liters per second] 250 gallons per minute (over and above normal consumption) for a period of at least two hours. Where there are numerous commercial buildings, this minimum might be converted to at least [31.54 liters per second] 500 gpm for one hour (the same total quantity of water but available at a greater flow rate for a shorter period of time).
>
> . . . the small settlement of a few hundred people and comprised of the usual number of small mercantile structures in a central commercial district would require [31.54 liters per second] 500 gpm in residential sections (well spaced or scattered small single family dwellings). In the commercial district, water in the range of [63.08 to 189.24 liters per second] 1,000 to 3,000 gpm would be required. A school complex serving the settlement and the surrounding territory probably would need something on the order of [189.24 to 315.4 liters per second] 3,000 to 5,000 gpm if there is a large building such as a gymnasium."

A great deal of flexibility is built into guidelines developed by the Insurance Services Office. This is necessary since firefighting requirements for individual communities vary greatly depending on population densities, land use patterns and the natural terrain, all of which affect running distances and response times for firefighting equipment. In addition, water requirements vary according to the character and scale of an area to be served. For example, the flow of water required to service low density residential areas is much less than that needed in a typical waterfront industrial area.

Recognizing that precise standards for fire protection are not generally applicable, the following standards are nevertheless offered.

- All communities to have at least one fire station with at least two fire trucks. The capacity of the fire trucks and the need for additional equipment will be determined primarily by fire flow requirements.
- Additional fire stations (each with at least two fire trucks) to be required where areas of concentrated development are beyond a 3.2 to 6.4 kilometer (2 to 4 mile) radius of existing fire stations. (The actual distance to vary according to possible response time).
- Established fire flow requirements for various areas of each community are assumed to remain approximately the same except in developing residential areas where a water flow minimum of 1,892.5 liters (500 gallons) per minute is assumed.

Each of the fire departments under consideration (Kenai, Soldotna, Homer, North Kenai) falls short of these standards in some respect, most often in regard to response time or availability of water for firefighting purposes, with detrimental effect on their insurance ratings.

In both the non-OCS and OCS cases, future demands for land will be estimated and additional firefighting capabilities needed to service population growth will be determined. In the OCS cases, it is assumed that major onshore oil and gas-related facilities such as an LNG plant or an oil terminal would provide their own fire protection capabilities, as is currently the case in Nikiski. However, facilities with relatively low inherent fire risks, such as service bases, would depend on municipal fire protection services.

Health

Of the communities under study, Kenai, Soldotna and North Kenai are served by the Central Peninsula General Hospital and Homer and its surrounding area are served by South Peninsula Hospital. The standards used to determine existing and future needs for medical facilities and services in the communities under study are those developed by South Central Health Planning and Development, Inc. These standards have been adopted and are used by the State of Alaska and are summarized on the following two pages.

The most critical element involved in health care is the presence of a physician. On average, it is assumed that one physician requires a practice of a minimum of 1,500 people. However, physicians are reluctant to work alone since there are occasions when back-up assistance is required and time is also needed away from the practice for vacations, conferences, education and other purposes. Therefore, physicians in isolated Alaska communities commonly practice in pairs. To support these two physicians, a population base of 3,500 people is generally required.

In some areas, the practice need not be confined to permanent residents nor need it be precisely 3,500. It may be economically feasible to have a practice for two physicians with a population base of closer to 3,000 people or less. A portion of the patient load in Homer, for example, is made up of fishermen, cannery workers and other visitors who are not permanent residents but are a part of the physician's load.

TABLE A-7

COMMUNITY LEVELS FOR
ASSESSMENT OF HEALTH RESOURCES

Criteria	Level I Village	Level II Subregional	Level III Regional	Level IV Urban	Level V Metropolis
Population	25 - 800	500 - 2,500	2,000 - 200,000	100,000 - 500,000	500,000 +
Isolation/Transportation Network	Distances from other communities resources great; transportation alternatives and reliability limited	Semi-regular transportation network to: 1) outlying villages & 2) regional center	Moderately reliable transportation network to: 1) subregional center & outlying villages 2) urban centers	Continuously reliable statewide transportation center	National international network
Communications	Unreliable radio contact; one or no phone services	Reliable radio; minimal phone service	Reliable radio, some television, statewide phone network	Radio, television, statewide phone network	All communications media; statewide phone network
Economic Development	Minimal or no services	Basic commerical services to outlying villages	Service and commercial center for majority of villages in the region	Statewide, financial & commercial center	Statewide, financial & commercial center
Examples	Eek, Egegik	Unalaska	Bethel, Homer	Anchorage	Seattle

Source: South Central Health Planning and Development, Inc.

It is assumed that each addition of an increment of 1,500 people above a population of 3,000 would require another physician in the communities under study.

In regard to hospital beds (used as a measure of hospital facility needs) acute care beds are used as an index. Acute care beds are general hospital beds as distinguished from long-term care or nursery beds. South Central Health Planning and Development, Inc. estimate the maximum capable of being adequately funded to be 3 to 3.5 acute care beds per 1,000 people in communities of at least 3,000 persons where the services of a physician are available.

In the non-OCS case and the OCS cases, 3.5 acute care beds per 1,000 people will be used as a standard for projection for communities with a population of more than 3,000. Given the high incidence of injury inherent in large scale construction projects and the more hazardous offshore operations such as loading and unloading supply boats and driving, the upper range of the standard for hospital beds is deemed to be warranted. In addition, the threat of fire or explosion is present with any activity involving fuels, and toxic materials are often intentionally or unintentionally handled.

Education

It is assumed that education facilities in the communities under study will continue to be provided by existing authorities, i.e. the Kenai Peninsula Borough for Kenai, Soldotna and Homer.

TABLE A-8

INDICATORS OF AVAILABILITY

el One	Level Two	Level Three	Level Four
tinerant public ealth nurse a/	1 mid-level practitioner	1 primary care M.D. per 3,500 people (no less than 2)	1.3 physicians per 1000 (less than half specialists) people
ealth aide and lternate b/	1 public health nurse	3 acute care beds per 1000 people	3 acute inpatient beds per 100 people
nic space	1 EMT II c/	community mental health center and psychologist	paramedics and advanced life support c/ d/
" trained person	1 dentist extender	1 dentist per 4000 people	inpatient psychiatric beds
ual itinerant al visits	diagnostic x-ray capability	x-ray technician	long term alcholism treatment beds c/
thly itinerant avioral health ker visits	1 behavioral health counselor or social worker	detox capability c/	neonatal beds/live births d/
unications tem	medical laboratory capability (microscope and refrigerator)	Class 4 emergency room (AMA) c/	therapeutic radiation capability d/
ual itinerant care	home health aide or long term care alternative	mobile e.m.s. capacity with EMT trained attendants	surgical capacity d/
esentative health ision-making group		medical techno' ogi st	1 CAT Scanner per 250,000 residents d/
		1 optometrist	pathology and autopsy capability
		short term she" ter care	blood bank
		itinerant M.D. specialist visits	specialists/population (see Table VC)

Definition to include audiologic testing, immunization.

Range of services provided by health aide as described in Guidelines for Primary Health Care

SCHPD will emphasize, during the first AIP, the development of additional and specific manopower, facilities and equipment standards -- particularly in the areas of behavioral health and emergency medical services (as relate to our highest health problem areas)

Federal guidelines have been issued related to these areas of medical care services. At the time of this publication, the Board of Directors has not made specific recommendations regarding them.

n-CC: South Central Health Planning and Development, Inc.

Generally, students make up a reasonably consistent proportion of a community's population, although recently a declining one due to the nationwide drop in birth rates. A comparison of school enrollment as a proportion of total population for five boroughs in Southeast and Southcentral Alaska (Ketchikan Gateway Borough, City and Borough of Sitka, Kenai Peninsula Borough, Kodiak Island Borough and Matanuska-Susitna Borough) indicated that students accounted for an average of 27.2 percent of the total population of these areas in 1970. By 1977, this had declined to 23.2 percent and would have declined even more significantly had it not been for the inclusion of the Kodiak Island Borough (where the closure of the Naval Station during this period resulted in an increase in the proportion of students to total population). Some further decline in the student to total population ratio is anticipated, For example, students accounted for only 18.3 percent of Anchorage's population and for 19.8 percent of that of the Ketchikan Gateway Borough in 1977. However, continued declines should be much less dramatic and student to population ratios are then expected to stabilize.

For purposes of forecasting school enrollment in the non-OCS case, the following assumptions have been made:

- The current average ratio for selected Southeast and Southcentral Alaska boroughs of approximately 23 percent of the population being enrolled in school is assumed to apply to Kenai, Soldotna and Homer. This ratio is then assumed to decrease by 1 percent per year until students account for 20 percent of total forecasted population, with that ratio to remain constant thereafter.

In the various OCS cases, assuming that most offshore population plus construction camp personnel are discounted, no significant changes in ratios of students to total population are anticipated.

Once total school enrollment has been forecasted, allocation of students between elementary and high school grades is necessary since standards for the number of students per classroom normally differentiate between the two levels. Approximately 60 percent of school students in Alaska are usually enrolled in the elementary grades. This proportion has been slightly lower recently as the "peak" student years are not in high school. However, the normal 60/40 ratio should again hold true in the near future.

According to the National Education Association, there are no established national or State standards for the number of students per classroom. Nevertheless, a standard used by many Alaska school districts is 25 students per classroom for the elementary (K-6) grades and 20 students per classroom for the high school grades.

To determine future classroom needs in the non-OCS case, the following assumptions have been made:

- Student enrollment will be divided on a 60 percent elementary (K-6) and 40 percent high school (7-12) basis throughout the forecast period.
- Standards of 25 students per classroom for elementary grades and 20 students per classroom for high school grades will apply throughout the forecast period.

For the various OCS cases, if new offshore population plus construction camp personnel are discounted, no significant changes in the assumptions made for the non-OCS case are anticipated in forecasting future school requirements.

Recreation

Recreation is a power which has been retained by the cities of Kenai, Soldotna and Homer (i.e. not transferred to the Kenai Peninsula Borough). However, as elsewhere in A" aska, much of the recreation function in these communities is assoc· ated with the schools. Thus, recreation facilities and services in Kenai, Soldotna and Homer are also provided by the Kenai Peninsula Borough School District.

The following standards suggested by the National Recreation and Park Association are basic standards which are slightly modified to apply to the communities of Kenai, Soldotna and Homer.

- Neighborhood Parks: 1.01 hectares (2.5 acres) per 1,000 people serving a population of 500 to 10,000 people.

- Play Lots and Other Neighborhood Recreation Areas: 0.2 hectares (0.5 acres) per 1,000 people serving a population of 250 to 2,500 people.

Therefore, a total of 1.2 hectares (3 acres) per 1,000 people is assumed to be required in outdoor neighborhood park and recreation areas. These outdoor areas are assumed to accommodate all outdoor basketball courts, baseball or softball diamonds, tennis courts, jungle gyms, etc. However, while national standards provide adequate guidelines for local parks and recreation, the combination of isolation, geography, climate and local desires for parks and recreation facilities in Alaska must also be taken into account.

Most isolated Alaska communities feel deprived without a reasonably full range of common parks and recreation facilities. For example, the national standard for 50 meter swimming pools is one per 20,000 people. However, almost every coastal Alaska coastal community of 2,000 people has a swimming pool as well as every major high school in the urban areas of the State. Perhaps a more extreme deviation from national standard! occurs with indoor basketball courts where most communities of any size have an indoor facility of some description.

Thus, in addition to outdoor recreation facilities, indoor basketball courts and swimming pools are needed and desired recreation facilities in the communities under study. These facilities provide recreation alternatives, especially during the long inclement Alaska winters.

Also, swimming pools permit the local populations to learn to swim and to develop swimming skills. In areas where a large proportion of the people work on boats or on the waterfront, these skills may be necessary for survival and they cannot be easily learned in the frigid ocean waters, streams or lakes of Alaska.

Therefore, the following minimum standards are assumed to apply to the communities under study:

- Indoor Basketball Courts: One for every 2,000 people.
- Swimming Pools: One for every 5,000 people.

There must also be some indoor recreation provision for those not desiring strenuous indoor recreation. In most Alaska communities, this form of recreation is provided through a community center or, as they are often called, a community hall. Thus:

- Community Center: One for every 25,000 people.

These standards will be applied to both the non-OCS and the OCS cases. However, it is assumed that the onshore OCS construction workforces located in camps will have recreation facilities provided at the camps, as was the case with the Alyeska pipeline project camps.

Utilities

Water. Kenai, Soldotna and Homer have public water systems, while the unincorporated area of Nikiski-North Kenai is served mainly by private wells. Water usage in the coastal municipalities under study is separated into two basic classes of service. These are industrial, which is the major consumer, and domestic. However, since water is not metered in these coastal communities, it is difficult to accurately estimate the consumption of each user class.

Present rates of water usage in coastal communities such as those under study are estimated by the U.S. Public Health Service to be approximately 454 liters (120 gallons) per person per day in domestic use. Local utilities estimate usage at approximately 473 liters (125 gallons) per person per day. This higher figure is believed to be warranted as the communities under study receive significant numbers of visitors for purposes of recreation, fishing and other activities. Thus, in the non-OCS case, the estimate of future water consumption for domestic purposes is calculated by multiplying the estimated annual average population by 473 liters (125 gallons) per person per day by the number of days in the year to arrive at estimated total annual domestic water use.

Industrial water use, estimated to be total water usage minus water used for domestic purposes, is forecast to maintain its current proportion of water estimated to be required in the non-OCS case for each community. Thus, it is assumed in the non-OCS case that added industrial activity, such as expansion in fishing and fish processing, results in water usage proportionate to the water usage resulting from the added population derived from the expanded industrial activity.

Forecast increases in population in the non-OCS case are based upon growth in existing economic sectors, and the distribution of employment (and therefore population) among these economic sectors was not significantly altered in forecasting future employment (and population). Therefore, it is assumed that the increase in domestic water consumption in the future provides an indication of potential industrial water consumption.

In the OCS cases, however, due to extreme fluctuations in demand during the exploration and development phases and the diversity of demands possible in the manufacturing and transportation processes during the production phases, forecasts of water requirements call for estimates based upon assessments of water usage of individual industrial activities as well as resulting domestic demands.

In the OCS cases, it is assumed that the per capita usage of water for domestic purposes will remain at 473 liters (125 gallons) per person per day. It is also assumed that normal water usage in all of the onshore OCS facilities will be 473 liters (125 gallons) 'per day per onsite employee. Offshore requirements on a'l1 boats, barges, rigs and platforms for general use are assumed to be 378.5 liters (100 gallons) per day per onsite employee. On the other hand, the water requirements for exploration wells drilled from rigs and development wells drilled from platforms were derived from the estimates provided by the Alaska State Department of Community and Regional Affairs based upon exploration drilling during Lease Sale No. 39 in the Northern Gulf of Alaska.

Approximately 40,000 gallons per day per offshore rig operation including supply boats was estimated by ARCO to be the offshore consumption. Of this amount 30$000 gallons is estimated to be drill water. Workover well drilling was assumed to require only 12.5 percent of normal platform consumption on average during the workover periods established by Dames and Moore.

The supply of water to offshore activities and to onshore service bases during construction and operations is assumed to be provided by the City of Homer or by the service base operator at Nikiski. Also, given the remote location of the Afognak Island facilities, their water requirements are not included in the water demands for the community systems.

Sewer. According to the U.S. Public Health Service, the quantities of domestic wastewater can be assumed to equal domestic water use and, since industrial wastes are not run through the sewage collection system and treatment plants in the communities under study, domestic wastewater can be assumed to equal total wastewater. Therefore, given a per capita consumption of 473 liters (125 gallons) per day of water usage and a peak flow being an estimated three times the average flow, a treatment plant would be required to have the capacity to process approximately 59.16 liters (15.63 gallons) per person per hour or:

- 473 liters (125 gallons)/day - 24 hours/day = 19.72 liters (5.21 gallons) /hour x 3 = 59.16 liter (15.63 gallon) capacity to accommodate peak loads.

Therefore, it is assumed that sewage treatment plants must have the capacity to accommodate 59.16 liters (15.63 gallons) of wastewater per person.

In the non-OCS case, it is also assumed that industrial wastes will continue to be processed by the industries generating the industrial waste.

In the OCS cases, the service base at Homer is assumed to be on the community sewer system. However, it is assumed that all sewage from the Nikiski service base and industrial facilities will be collected and treated by the industry at the respective plants. It is further assumed that all wastewater from offshore rigs, boats, barges and platforms will be treated onboard.

Electric Power. Electric power is distributed to all the communities under study by the Homer Electric Association, Inc. which purchases bulk power from Chugach Electric Association. Present firm demand amounts to about 3.75 KW per person of installed capacity for all uses. These uses with rare exceptions do not include heating nor due they include basic service to several Nikiski industrial plants which maintain their own generators but rely upon Homer Electric Association for stand-by power.

In calculating future demands for the non-OCS case, it is assumed that an installed capacity of 3.75 KW per person of installed capacity. This assumption is based upon servicing the same basic household functions currently being serviced and an industrial mix within each community that is similar to the present industrial distribution.

In the OCS cases, 3.75 KW per person of installed capacity is demanded for each new resident. It is also assumed that construction site and construction camp activities will require 3 KW per person. However, it is assumed that only the construction sites and camps related to service bases on the Kenai Peninsula and the resulting operating facilities will be newly served by the existing power system. Service bases are assumed to have demand for electric power exceeding the overall 3 KW per person standard. Approximately 650 KW is required to drive the pumps for loading water, fuel, and powdered mud and cement onboard the supply vessels. This block of power is sufficient to accommodate two berths. Additional increments of two berths will require 650 KW to power like equipment. The service base, oil terminal and other facilities assigned to Afognak Island are presumed to meet their own power supply needs.

Communications. Telephone service in the communities under study is currently provided by Glacier State Telephone Company, a subsidiary of Continental Telephone System. The Alaska Public Utilities Commission, the Municipality of Anchorage's Telephone Utility and the Southeastern Telephone Company were contacted in an attempt to derive standards for future levels of telephone service which are likely to be demanded in these communities.

According to the Anchorage Telephone Utility, in order to determine future levels of demand, the number of lines (i.e. excluding extensions) is estimated by using past trends and applying them to forecasts of populat on growth. The consulting engineers for the Southeast Telephone Company employ a linear trend equation based upon past lines installed.

Both means of forecasting are short range and depend upon yearly installation figures. A relationship, however, was found between telephone lines in use and housing units. In the three communities under study, the number of lines per housing unit was between 1.1 and 1.2. Using Anchorage as a comparison, Anchorage has approximately 2 telephone lines per housing unit. On the other hand, in 1970 Anchorage had only 0.57 telephone lines per housing unit (or with the military housing units totally discounted 0.89). This represents a growth rate of over 15 percent per year. However, Anchorage's unique function as the hub of Alaska's communications and transportation and its Statewide appeal as a retail and services area must be taken into account.

In both the non-OCS and the OCS cases, it is assumed that 1.25 lines will be required initially for each housing unit added increasing yearly by .01 until there are 1.40 lines per housing unit. However, housing units do not include group housing such as construction camps or cannery barracks as a basis for calculating future requirements. It is also assumed that telephone equipment and services will be provided by the existing telephone utility companies.

pounds per cubic yard since it is composed in large part of steel items such as used drill bits. Upon completion of development, one-fourth the. amount generated by maximum platform activity is assumed to return from the platforms during the production phase.

In terms of tonnage and density, there is a limited amount of toxic solid waste returning to shore for disposal. Generally, this is in the form of used oil or oiled materials. Onshore, some used oil plus sediment materials, sludge, scum and other wastes from the manufacture of LNG and the treatment of crude oil are toxic. The quantities are small and can be disposed of by the community in an environmentally sound manner on a small especially prepared site.

LOCAL GOVERNMENT REVENUES

Where possible, the following standards, methods and assumptions will be employed to forecast community revenues and expenditures. The resulting surplus or deficit calculated provides an indication of the community's ability to fund capital improvements or upgrade services employing current rates and measures to capture revenues.

The following assumptions are made:

- Forecasts of revenues are made using current rates and measures as a basis for projection. A 5-year average or an average appropriate to reflect recent circumstances will be utilized.

Solid Waste Disposal. The standards for solid waste disposal are based upon disposal records of the Municipality of Anchorage and trends of solid waste generation in Anchorage. According to the Solid Waste Division of the Public Works Department, the average Anchorage resident during 1977 generated 5.35 pounds of solid waste per day. This has been projected to increase at an average rate of 2 percent per year through 1985 then at an average rate of 1 percent through 1990. Thereafter, it is assumed that no increase in the per person rate of solid waste generation will take place.

In terms of sanitary landfills, the Municipality records an average density of 330 pounds per cubic yard delivered and 800 pounds per cubic yard in place. These standards are assumed for the forecast of the non-OCS cases in the communities under study.

In the OCS cases, the same standards as the non-OCS case are assumed. In addition, it is assumed that all onshore facilities with the exception of the helicopter operations will generate 6.5 pounds per day per employee of additional non-toxic solid waste.

Offshore, all combustible materials are assumed to be incinerated and only noncombustible materials are returned to shore for disposal. This is estimated to be one ton per week per semisubmersible rig, platform rig or barge operation including any refuse from supporting boats during the exploration and development phases. Furthermore, the average density of this solid waste is estimated to be approximately 4,000

- The existing level of service is used as the basis for projection. Despite a level of service which may be less than desired, expenditures for services are maintained at current levels.
- Current State statutory limitations on taxation of certain oil and gas properties by local governments will continue to be in force. Although local governmental units theoretically have the power to levy property taxes of up to 30 mills, in reality their taxing ability may fall far short of this because of limitations on the taxation of certain oil and gas properties as defined in Title 43.56 of the Alaska Statutes. These limitations are set forth in Section 29.53.045 of the Alaska Statutes, which is quoted in part:

  "(a) A municipality may levy and collect taxes on taxable property taxable under AS 43.56 only by using one of the methods set out in (b) or (c) of this section.

  "(b) A municipality may levy and collect a tax on the full and true value of taxable property taxable under AS 43.56 as valued by the Department of Revenue at a rate not to exceed that which produces an amount of revenue from the total municipal property tax equivalent to $1,500 a year for each person residing within its boundaries.

  "(c) A municipality may levy and collect a tax on the full and true value of that portion of taxable property taxable under AS 43.56 as assessed by the Department of Revenue which value, when combined with the value of property otherwise taxable by the municipality, does not exceed the product of 225 percent of the average per capita assessed full and true value of property in the State multiplied by the number of residents of the taxing municipality."

  Title 29.53.055 of the Alaska Statutes states that there is no limitation on taxes levied or pledged to pay or secure the payment of the principal and interest on bonds. In this regard, Chapter 94 SLA 1977 stressed that the per capita limitation did not include debt service. AS 29.53.055 is quoted as follows:

> NO LIMITATION ON TAXES TO PAY BONDS. The limitations provided for in Sec. 45 or 50 of this chapter do not apply to taxes levied or pledged to pay or secure the payment of the principal and interest on bonds. Taxes to pay or secure the payment of principal and interest on bonds may be levied without limitation as to rate or amount, regardless of whether the bonds are in default or in danger of default.

Therefore, at the extreme, AS 43.56 serves only to limit municipal operating budgets.

- The limitation imposed in AS 29.53.045(b) is used in this study as the upper limit of municipal property tax revenues. Therefore, total property tax equivalent to $1,500 a year for each person residing within the municipal boundary is assumed as the upper limit of property tax revenues.
- It is also assumed that the excise tax limitation imposed in AS 43.56.030 cited below will remain in effect throughout the planning period.

> AS 43.56.030(2): . . .all other taxes imposed by a municipality on or with respect to the property subject to tax under this chapter or exempted from taxation by Section 20 of this chapter, including, but not limited to,
>
> (A) taxes on the retail sale or use of the property except for the retail sales tax on the first $1,000 of each sale;
> (C) taxes on the sale or use of services used inor associated with the property or in its maintenance or operation except for the sales tax on the first $1,000 of each sale;
> (E) any license, excise, fee, charge or other tax on or pertaining to the property or services.

As a result of this limitation, significant revenues are not forthcoming from oil and gas activities. Therefore, a projection of current sales tax revenues on a per capita basis is assumed to be representative of the future receipts from this revenue source.

- It is assumed that current federal law prohibiting State or local government taxation of properties beyond the three mile limit or revenue sharing from oil and gas development on the Outer Continental Shelf will remain in effect throughout the planning period.

Revenues

Revenues are grouped and forecast under the headings of property taxes, sales taxes, intergovernmental revenue and other revenue. School District revenues are forecast as to funds forthcoming from local , State and federal sources.

Property Tax Revenues. The non-OCS property tax revenue estimates are based upon per capita additions to assessed valuation. Thus, each new resident is assumed to add to the assessed value of the community an amount equal to the total assessed value in the base year divided by the total population. The total assessed value is then multiplied by the current millage rate to obtain the forecast of uninflated property tax revenue for each year.

In the OCS cases, property tax revenue estimates are based upon per capita additions to assessed valuation as the estimates are in the base case. However, the increase in assessed value due to major capital investment in onshore oil and gas facilities is factored in, based upon the investment costs and schedules provided by Dames and Moore in the petroleum development scenarios. It is recognized that improvements in a given year will not appear as increases in assessed value until the tax rolls are compiled the following year. Thus, there is a lag in the receipt of revenue.

An exception to the per capita calculation is construction employment living in construction camps. Outside of the assessed valuation of the construction camp which is included in the cost of the construction of major onshore oil and gas facilities, these workers' contribution to the assessed valuation of the community is small. Therefore, the estimated per capita additions do not include workers on major construction projects living in construction camps.

Also, the limitation of total property tax equivalents to $1,500 a Year for each person residing within the municipal boundary in AS 29.53.045(b) is employed as a indicator of the limitation under State law. However, this should not be construed as the maximum estimate of property tax revenues since the formula developed with the State Department of Revenue under AS 29.53.045(c) may prove more remunerative. The limitation under the formula cannot be derived for this study since the formula requires the determination of assessed value by the State.

Sales Tax Revenues. Sales tax revenues in the non-OCS case are based upon the current per capita additions to sales tax receipts. Thus, each new resident is assumed to add to the total sales tax receipts of the community an amount equal to the total sales tax receipts in the base year divided by the total population.

In the OCS cases, sales tax revenue estimates are based upon per capita additions to sales tax receipts as the estimates are in the base case. However, in the OCS cases where major construction activities take place onshore, it is assumed that the construction workers will live in camps with accommodations of excellence. It is assumed that, on average, an employee residing in a camp will spend only 1/10 as much as an employee with a permanent residence outside the construction camp. Therefore, in the calculation of sales tax revenues only 10 percent of the workers resident in construction camps will be counted.

Intergovernmental Revenues. In the non-OCS case and the OCS cases, intergovernmental revenues estimates are based upon per capita additions to intergovernmental revenues. Thus, each new resident is assumed to add to the intergovernmental revenues transferred to the community an amount equal to the total value of intergovernmental revenues in the base year divided by the population.

Other Revenues. In the non-OCS case, other revenues estimates are based upon per capita additions to the total of other revenues such as license fee, permits, interest earnings, rentals, etc. Thus, each new resident is assumed to add to other revenues of the community an amount equal to the total value other revenues in the base year divided by the total population.

In the OCS cases, other revenues estimates are based upon per capita receipts as are the estimates in the base case. However, in the OCS case where major construction activities take place onshore, it is assumed that the construction workers will live in construction camps of excellence with a wide range of recreation facilities and services. Thus, it is assumed that on average an employee residing within a camp will contribute little to the generation of these revenues. Therefore, in the calculation of other revenues on a per capital basis only 10 percent of the workers resident in construction camps will be counted.

School District Revenues. School District revenues are forecast on a per student basis for local, State and Federal revenues. It is assumed that approximately the same proportion of revenues from these three governmental divisions will continue throughout the planning period.

Expenditures

Operating Expenditures. In the non-OCS case, the operating budget is forecast on a per capita basis.

In the non-OCS cases, the operating budget is also forecast on a per capita basis. However, where major construction activities take place onshore, it is assumed that construction workers in camps will not require the same expenditures as those resident in the community outside the camps. It is estimated that the expenditures required per employee resident in the construction camps will be approximately 1/5 as much as a worker residing outside the camp. Therefore, in calculating operating expenditures on a per capita basis 20 percent of the workers resident in construction camps will be counted.

Debt Service. Debt service is the amount necessary to pay or secure the payment of the principal and interest of bonds. In all cases only existing debt service requirements to maturity will be listed.

School Support. Funds provided to support local school districts are calculated on a per student basis. It is assumed that a proportionate share of the support of schools will be maintained for local, State and Federal support throughout the planning period.

Surplus or Deficit. In the non-OCS case and the OCS cases, the total of revenues is subtracted from the total of expenses to produce a surplus or a deficit of funds. A surplus represents funds available for additional capital improvements or additional operating expenditures. A deficit indicates the inability to provide for the same level of community services and to provide added capital improvements.

Bibliography

Ackerman, Robert E. 1975. The Kenaitze People. published by Indian Tribal Series, Phoenix, Arizona.

Adams, Corthell, Lee, Wince & Associates. June 1968. A Preliminary Report - Water System and Sewer System, City of Soldotna.

Alaska Consultants, Inc. July 1976. Marine Service Bases for Offshore Oil Development prepared for the Alaska Department of Community and Regional Affairs, Division of Community Planning. Anchorage, Alaska.

Alaska Crop and Livestock Reporting Service. June 1978. Alaska Agriculture Statistics - 1978. Palmer, Alaska.

Alaska Department of Community and Regional Affairs. n.d. Alaska Community Surveys - Homer.

_____ Unpublished. Preliminary Scenarios of the Impact of Future Oil Development on Populations in the Kenai Peninsula Borough.

Alaska Department of Community and RegionalAffairs, Division of Community Planning. October 1977. Planning for Offshore Oil Development: Economic Forecasts, Lower Cook Inlet Lease Sale by Niall Trimble. Juneau, Alaska.

_____ 1978. Planning for Offshore Oil Development, Gulf of Alaska OCS Handbook by Lois S. Kramer, Veronica C. Clark and George J. Cannelos. Juneau, Alaska.

Alaska Department of Community and Regional Affairs, Division of Local Government Assistance. January 1979. Alaska Taxable: Municipality Property Assessments and Equalized Full Value Determinations. Juneau, Alaska. Vol. XVIII, No. 1.

Alaska Department of Economic Development. n.d. Homer Community Profile.

Alaska Department of Fish and Game. n.d. Cook Inlet Commercial Gear and Vessel License by Year, 1968 - 1975.

_____ 1976. A Fish and Wildlife Resource Inventory of the Cook Inlet - Kodiak Areas. Volume 1 - Wildlife, Volume Z-- Fisheries. Anchorage, Alaska.

_____ January 1978. Investigations of Cook Inlet Sockeye Salmon (Completions Report for Period July 1, 1974 to June 30, 1977) by Thomas B. Namtvedt, et al. Prepared for the National Oceanic and Atmospheric Administration.

_____ April 1979. Cook Inlet Sockeye Salmon Studies (Technical Report Report for Period July 1, 1977, to June 30, 1978) by Thomas B. Namtvedt, et al. Prepared for the National Oceanic and Atmospheric Administration.

Alaska Department of Fish and Game, Division of Commercial Fisheries. n.d. Annual Management Report - 1974 - Lower Cook Inlet Area. Anchorage, Alaska.

_____ May 1, 1978. Annual Management Report - 1977 - Upper Cook Inlet Area, Region II. Anchorage, Alaska.

_____ December 1978. Salmon Management Report to the Alaska Board of Fisheries - 1978. Juneau, Alaska.

_____ December 1978. 1978 Upper Cook Inlet Salmon Report, Board of Fisheries. Anchorage, Alaska.

Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer Area Office. n.d. Shellfish Report to the Alaska Board of Fisheries - 1979. Homer, Alaska.

Alaska Department of Highways. 1971. Plans and Profile: Kenai Spur, Kenai High School to Wildwood Station Road, As-Built Plans.

Alaska Department of Labor, Employment Security Division. Annual Publication. Alaska Labor Force Estimates by Area and Employment by Industry. Juneau.

_____ Annual Publication. Statistical Quarterly. Juneau.

Alaska Department of Natural Resources, Division of Lands. February 2, 1965. (Revised January 31, 1966 and February 28, 1977). Timber Volume Estimate of Commercial Forest Stands on the Kenai Peninsula by Floyd R. Johnson and revised by Enzo Becia. Anchorage, Alaska.

Alaska Department of Natural Resources, Division of Parks. n.d. Kachemak Bay State Park. Anchorage, Alaska.

Alaska Department of Natural Resources, Division of Parks, Planning Section. November 1976. Coastal Recreation Resources: West Kenai Peninsula, Alaska by Alan Meiners. Prepared for Alaska Coastal Management. Program. Anchorage, Alaska.

Alaska Historical Society. 1975. The Archaeology of Cook Inlet, Alaska by Frederica De Laguna. Anchorage, Alaska.

Alaska Humanities Forum. 1974. Prehistory of the Northern Kenai Peninsula in the Native, Russian and American Experiences of the Kenai Area of Alaska by D.R. Reger. Kenai, Alaska.

Alaska Office of the Governor, Criminal Justice Planning Agency. n.d. Crime in Alaska - 1978. Juneau, Alaska.

_____ April 6, 1978. Crime in Alaska - 1977. Juneau, Alaska.

Alaska State Housing Authority. 1965. Kenai Comprehensive Development Plan. Anchorage, Alaska.

_____ March 1968. Kenai Peninsula Borough: Comprehensive Planning Program - Survey and Analysis. Anchorage, Alaska.

Spring 1969. City of Homer Comprehensive Development Plan. 'Anchorage, Alaska.

_____ 1970. Kenai Peninsula Borough: Comprehensive Planning Program Recommendations. Anchorage, Alaska.

Arctic Environmental Information and Data Center. 1972. The Cook Inlet Environment: A Background Study of Available Knowledge by S.C. Evans, et al. Anchorage, Alaska.

_____ 1974. Alaska Regional Profiles: Southcentral Region by Lidia Selkregg. Anchorage, Alaska.

Arthur Young & Company. September 22, 1978. City of Homer, Financial Statements, Year Ended June 30, 1978 with Report of Certified Public Accountants. Anchorage, Alaska.

CH2M Hill. July 1973. Report and Data Summary, Homer Spit Landmass and Shoreline Stability. Prepared for the City of Homer. Anchorage, Alaska.

_____ August 1976. Preliminary Water System Study: City of Soldotna, Alas ka. Anchorage, Alaska.

_____ September 1976. Sewage System Study: City of Soldotna. Anchorage, Alaska.

_____ May 1977. Comprehensive Sewer Plan: Homer, Alaska. Anchorage, Alaska.

_____ May 1977. Comprehensive Water Plan: Homer, Alaska. Anchorage, Alaska.

_____ October 1977. Homer Spit Sewerage Facilities Plan: Homer, Alaska. Anchorage, Alaska.

_____ December 1977. Wastewater Facilities Plan: City of Soldotna, Alaska. Anchorage, Alaska.

_____ June 1978. Offshore Oil Development in Lower Cook Inlet: Implications for the Kenai Peninsula. Anchorage, Alaska.

_____ September 1978. Wastewater Facilities Plan: City of Kenai, Alaska. Anchorage, Alaska.

_____ March 1979. Amendment to the Wastewater Facilities Plan, City of Soldotna, Alaska. Anchorage, Alaska.

City of Homer. Winter 1975. City of Homer Growth Study. Homer, Alaska.

_____ Fall 1978. Comprehensive Development Plan: Homer, Alaska (draft). Homer, Alaska.

City of Kenai. February 26, 1971. Kenai Harbor. Kenai, Alaska.

Dames and Moore. March 1979. Alaska OCS Socioeconomic Studies Program, Lower Cook Inlet and Shelikof Strait, OCS Lease Sale No. 60, Petroleum Development Scenarios. Prepared for the Bureau of Land Management, Alaska Outer Continental Shelf Office. Anchorage, Alaska.

Galliett Co. Engineers, Surveyors. January 1973. Addendum 1 to Comprehensive Water and Sewer Study for the Kenai Peninsula Borough. Anchorage, Alaska.

Greater Kenai Chamber of Commerce. n.d. Tour of Old Kenai. Kenai, Alaska.

Harold F. Wise and Associates, Inc. April 1970. The Kenai Borough Economic Development District, Inc., Program, Budget, and Application to the Economic Development Administration.

Joint Federal-State Land Use Planning Commission of Alaska. April 1973. Kenai Peninsula, A Description. Anchorage, Alaska.

Joint Federal-State Land Use Planning Commission for Alaska, Resource Planning Team. 1972. Inventory of Southcentral Region: Antiquities Resources by C. Holmes. Anchorage, Alaska.

_____ 1974. Resources Inventory: Southcentral Region. Anchorage, Alaska.

Kenai Peninsula Borough. 1970. Comprehensive Planning Program Recommendation. Soldotna, Alaska.

_ June - September 1973. Comprehensive Plans Goals and Objectives. Soldotna, Alaska.

Kenai Peninsula Borough, Growth Monitoring Program. January 1979. Statistical Report. Volume 1. Soldotna, Alaska.

Kenai Peninsula Borough, Growth Monitoring Program Advisory Committee. March 1979. Special Census of Population. Soldotna, Alaska.

Kenai Peninsula Overall Economic Development Program. n.d. 1977-78 Annual Report and Program of 1980. Soldotna, Alaska.

Kenai Peninsula Borough, Overall Economic Development Program. October 1972. Tourism, the Recreational Vehicle and the Kenai Peninsula Borough. Soldotna, Alaska.

Kenai Peninsula OEDP Committee. Revised September 15, 1976. Overall Economic Development Program, Kenai Peninsula Borough. Soldotna, Alaska.

Kenai Peninsula Borough, Overall Economic Development Program Staff. February 1978. A Profile of the Commercial Fishing Industry, Kenai Peninsula Borough. Soldotna, Alaska.

Kenai Peninsula Borough, Planning Department. 1977. OCS Development Baseline Study, 1977 by Ike D. Waits and Michael A. Brogan. Soldotna, Alaska.

Kenai Peninsula Borough, Planning Department, Economic Development Office. September 1973. Tourism Survey: Kenai Peninsula by Susan Mumma. Soldotna, Alaska.

Kenai Peninsula Borough School District. March 23, 1978. Enrollment Projections and School Construction Needs, School Years: 1978/79 Thru 1982/83 by Paul C. Gallaher and Frank McIlhargey. Soldotna, Alaska.

Martin, Harry V., and Associates. 1977. Kenai, A Business Prospectus. The Peninsula Clarion.

Mathematical Sciences Northwest, Inc. and Human Resources Planning Institute, Inc. October 15, 1976. A Social and Economic Impact Study of Off-Shore Petroleum and Natural Gas Development in Alaska. Prepared for the Bureau of Land Management.

McDowell, Homan & Associates. 1975. Soldotna Campground Feasibility Study. Juneau, Alaska.

Price Waterhouse and Co. August 15, 1978. City of Soldotna, Financial Statements and Supplementary Information, June 30, 1978. Anchorage, Alaska.

Real Estate Research Corporation. 1965. Economic Development Base: City of Kenai, Alaska. Prepared for the Alaska State Housing Authority. Los Angeles, California.

Ted Forsi & Associates. n.d. City of Soldotna: Comprehensive Development Plan, Final Draft.

Thorpe, R.W. and Associates and Mundy/McCrackin and Associates. 1979. City of Kenai Land Use Analysis, Summary Report. Review Draft. Seattle.

TRA/Farr and Tap, Inc. 1978. Kenai Municipal Airport Master Plan Study.

Tryck, Nyman & Hayes. 1970. Comprehensive Water and Sewer Study for the Kenai Peninsula Borough. Anchorage, Alaska.

_____ October 1974. Kenai Peninsula Borough Water Quality Management Study. Anchorage, Alaska.

_____ October 1, 1977. Homer Harbor Expansion Study: Preliminary Design and Engineering Feasibility Study for Expansion of the Homer Small Boat Harbor. Juneau, Alaska.

University of Alaska. 1975. Focus on Alaska's Coal - 1975. MIRL Report #37. Fairbanks, Alaska.

University of Alaska, Anchorage Urban Observatory. 1977. A Profile of Five Kenai Peninsula Towns by Diddy R. Hitchins, Richard L. Ender, G. Hayden Green and Marsha Bennett prepared for the Kenai Peninsula Borough. Anchorage, Alaska.

Unwin, Scheben, Korynta. May 1975. Homer Spit Land Use Study. Anchorage, Alaska.

U.S. Bureau of the Census. 1960. U.S. Census of Population: 1960, Number of Inhabitants, Alaska. Washington, D.C. Final Report PC(1)-3A.

_____ 1971. U.S. Census of Population: 1970, General Social and Economic Characteristics, Alaska. Washington, D.C. Final Report PC(L)-C3.

_____ May 1971. U.S. Census of Population: 1970, Number of Inhabitants, Alaska. Washington, D.C. Final Report PC(1)-A3.

U.S. Department of Agriculture, Soil Conservation Service. June 1962. Soil Survey, Kenai-Kasilof Area, Alaska. Washington, D.C.

_____ July 1971. Soil Survey, Homer - Ninilchik Area, Alaska by Robert B. Hinton, Washington, D.C.

US. Department of Agriculture, Statistical Reporting Service. 1975. Alaska Agriculture Statistics. Palmer, Alaska.

US. Department of the Army, Alaska District, Corps of Engineers. August 1974. Kachemak Bay - Homer Spit, Beach Erosion Control Feasibility Report. Anchorage, Alaska.

_____April 1978. Kenai River Review - Final. Anchorage, Alaska

_____1967. Flood Plain Information, Kenai River. Anchorage, Alaska

Us. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, National Climatic Center. n.d. Local Climatological Data, Annual Summary with Comparative Date, 1977: Homer, Alaska. Asheville, North Carolina.

Us. Department of the Interior. 1971. Hydrologic Data of the Kenai - Soldotna Area, Alaska.

Us. Department of the Interior, Bureau of Land Management, Alaska Outer Continental Shelf Office. n.d. Lower Cook Inlet: Final Environmental Impact Statement (3 volumes).

Us. Department of the Interior, Geological Survey. 1966. Effects of-the Earthquake of March 27, 1964 in the Homer Area by Roger M. Wailer. U.S.G.S. Professional Paper 542-D. Washington, D.C.

_____1968. Water Resources and Surficial Geology of the Homer Area, Southcentral Alaska.

_____1969. Effects of the Earthquake of March 27, 1964 on Various Communities by George Plafker, Reuben Kachadoorian, Edwin Eckel and Lawrence Mayo. U.S.G.S. Professional Paper 542-G. Washington, D.C.

_____1976. A Preliminary Evaluation of Selected Earthquake-Related Geological Hazards in the Kenai Lowland, Alaska by Russel G. Tysdal. U.S.G.S. Open File Report #76-270. Menlo Park, California.

U.S. Environmental Protection Agency. May 1975. Technical Assistance, Soldotna Wastewater Treatment Facility.

_____May 1975. Technical Assistance, Kenai Wastewater Treatment Facility.

Wince-Corthell and Associates. 1972. Plans: Sewage Treatment Plant.

Woodward-Clyde Consultants. September 1977. Kenai Slope Erosion Study (1 etter report).