OVERVIEW OF

LOCAL ECONOMIC DEVELOPMENT IN THE

ATHABASCA OIL SANDS REGION

SINCE 1961

by

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ABSTRACT

This study was commissioned to review the economic evolution of the Athabasca Oil Sands region since 1961. The research involved, first, the identification, review, and analysis of existing data sources and that information is included in an annotated bibliography. The existing information base was supplemented with additional data tabulation and field research, including interviews with various individuals in industry and government, as a means of filling some of the more important data deficiencies.

The report examines the economy of the AOSERP study area and traces some of the more important changes that have occurred since major oil sands development began. Particular emphasis is devoted to the Fort McMurray area, where much of the regional economic development has centered.

The results of the research are organized into sections dealing with regional industrial development, population, employment, housing, and incomes and prices. Following those sections, more generalized comments regarding the impacts of growth are discussed. Appendix 10.1 includes an analysis of historical growth in the local business sectors of Fort McMurray and Fort Chipewyan.

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We would like also to recognize the invaluable input of Carcajou Research Limited and, in particular, of P. Conway, who has been largely responsible for carrying out the survey and analysis of local business development in Fort McMurray and Fort Chipewyan; that section is included in Appendix 10.1.

SUMMARY OF FINDINGS

1. At the beginning of the study period in 1961, the AOSERP area was a relatively isolated part of the province with a small, predominantly native population. The economy was reliant on the area's function as a transportation thoroughfare to other regions in the far north, and on traditional resource industries such as hunting, fishing, trapping, and forestry. The scattered urban settlements, most significantly Fort McMurray, provided a basic level of services to the region.

2. Since 1961 the AOSERP study area has undergone a major economic metamorphosis which has been induced almost entirely in response to commercial oil sands development. The development induced by the resource projects is notable in the following ways: (1) the projects have been of much greater magnitude and labour intensiveness than was ever anticipated; (2) the economic growth has been localized and concentrated in the Fort McMurray area; and (3) the oil sands operations now dominate the regional economy and constitute the only significant industry in which the output is destined for extra-regional markets.

3. The population of the region has increased rapidly over the period 1961 to 1978. In 1961 the population of the AOSERP area stood at approximately 2600. One half of those people resided in Fort McMurray, with most of the remainder in the unincorporated communities of Fort Chipewyan, Fort MacKay, and Anzac. The current 1978 population of the region is estimated to be somewhat more than 26 000. The annual growth rate in population over the period has been about 15%. Most of the growth has been concentrated in Fort McMurray, which now comprises 93% of the AOSERP area population. Growth outside of the town has been modest over the period, and the related population now amounts to roughly 1900.

4. The Fort McMurray area has witnessed a significant change in the size and structure of its local economy which was first prompted by the Great Canadian Oil Sands (GCOS) development in the mid-1960s and then, after a five-year pause, by the Syncrude Canada Ltd. (Syncrude) project, which has recently become operational. Most of the urban development in the region has been

focussed on Fort McMurray, which has grown by a factor of about 25 times since 1961. At the beginning of the study period, Fort McMurray was a relatively dormant community functioning as a service and trading centre for the entire region and as an important rail and river transportation hub connecting to the far north. The magnitude of the oil sands projects which followed would have been large in any context but, superimposed on the undeveloped local and regional economy, the impact has been overwhelming. The projects were labour intensive at both the construction and operating phases, and their development had dramatic effects on the economic base of the town. The first major effect occurred during the plant construction phases, which each extended over a period of four to five years. A massive influx of men, materials, and equipment was required to build the plants and the attendant urban and regional infrastructure. The construction phase was then followed by a major build-up in operating and indirect service employment.

Today, Fort McMurray functions as a dormitory town for the commercial oil sands projects and as a regional service centre. The community has virtually no manufacturing base, except for a small number of enterprises serving local markets, and almost all equipment, consumable and durable goods and materials must be imported from outside the town and region. An increasing number and range of retail and service outlets are locating in Fort McMurray, although residents still look outside the region for a significant portion of higher order goods and personal services. At the time this report was prepared, the growth of the tertiary industry in the community was still under way, and it is too early to determine to what level it will expand without further basic economic stimulus.

5. Economic development associated with resource exploitation has largely bypassed the remainder of the AOSERP area outside of the Fort McMurray vicinity. The primary industries such as forestry, fishing, and trapping which have traditionally been important to the smaller settlements and the outlying areas have shown no perceptible expansion over the study period and probably have decreased in absolute as well as relative terms. Increased government employment

and work programs, as well as transfer payments, have to some degree offset the absence of growth in the more traditional sectors. Employment and income levels, which were low at the beginning of the study period, appear to be lagging even farther behind those in the immediate oil sands impact area. Social infrastructure standards also appear to have lagged in much of the AOSERP area outside Fort McMurray because of the greater isolation, smaller population, poorer incomes, and undeveloped economy in that area. At the beginning of the study period, the population of the AOSERP area was also much more evenly distributed among the various settlements than it is now, when Fort McMurray dominates the entire northeastern Alberta region.

6. Synthetic crude oil and, to a lesser extent, the byproduct sulphur account for virtually all the basic industry output of the AOSERP study area. Basic industry activities are considered to be those which provide goods and services to persons outside the region. The annual value of output of the commercial oil sands plants--in general destined for consumption outside the area--is likely to be in the order of $800 million in the near future. On the other hand, the study area is virtually dependent on the inflow from other areas for almost all the materials, equipment, and supplies it requires. Manufacturing capacity is small, and primary industries make only a modest economic contribution in the area. The service sector, including government administration, has expanded not only in size but also in the range and level of services offered. However, local communities have not yet reached a threshold size and stage of economic maturation sufficient to support a full range of service activities or to avoid a substantial leakage of service expenditures outside the region.

1. INTRODUCTION

1.1 PURPOSE

This research project was commissioned in September 1978; its main purpose was "to identify and analyze the effects of Athabasca Oil Sands development on the evolution of the local economy since 1961, in order to provide an information base which will help interested agencies maximize positive effects and minimize negative effects of rapid growth associated with oil sands development on people in the region".

1.2 METHODOLOGY

The first step in carrying out the required research involved the identification, review, and analysis of existing data. Published documents which were reviewed and found relevant to an understanding of the economic development of the study area (Figure 1) have been annotated and included in Appendix 10.2.

It became clear in examining the more readily available data sources that major deficiencies and inadequacies were inherent in that data base. Some of the deficiencies included the following:

1. Most of the documents date only from about 1975, when the major impacts of the Syncrude Canada Ltd. (Syncrude) project had already begun to emerge.
2. Many of the existing reports have been prepared to assess future impacts and requirements, and are of historical interest for our research purposes primarily to the extent that they contain baseline information.
3. The studies are, in most instances, directed to specific and isolated fields or sectors of enquiry such as housing, urban or regional planning, transportation issues, manpower supply and demand, and retail or commercial needs. Those reports that have attempted to draw a historical perspective of economic

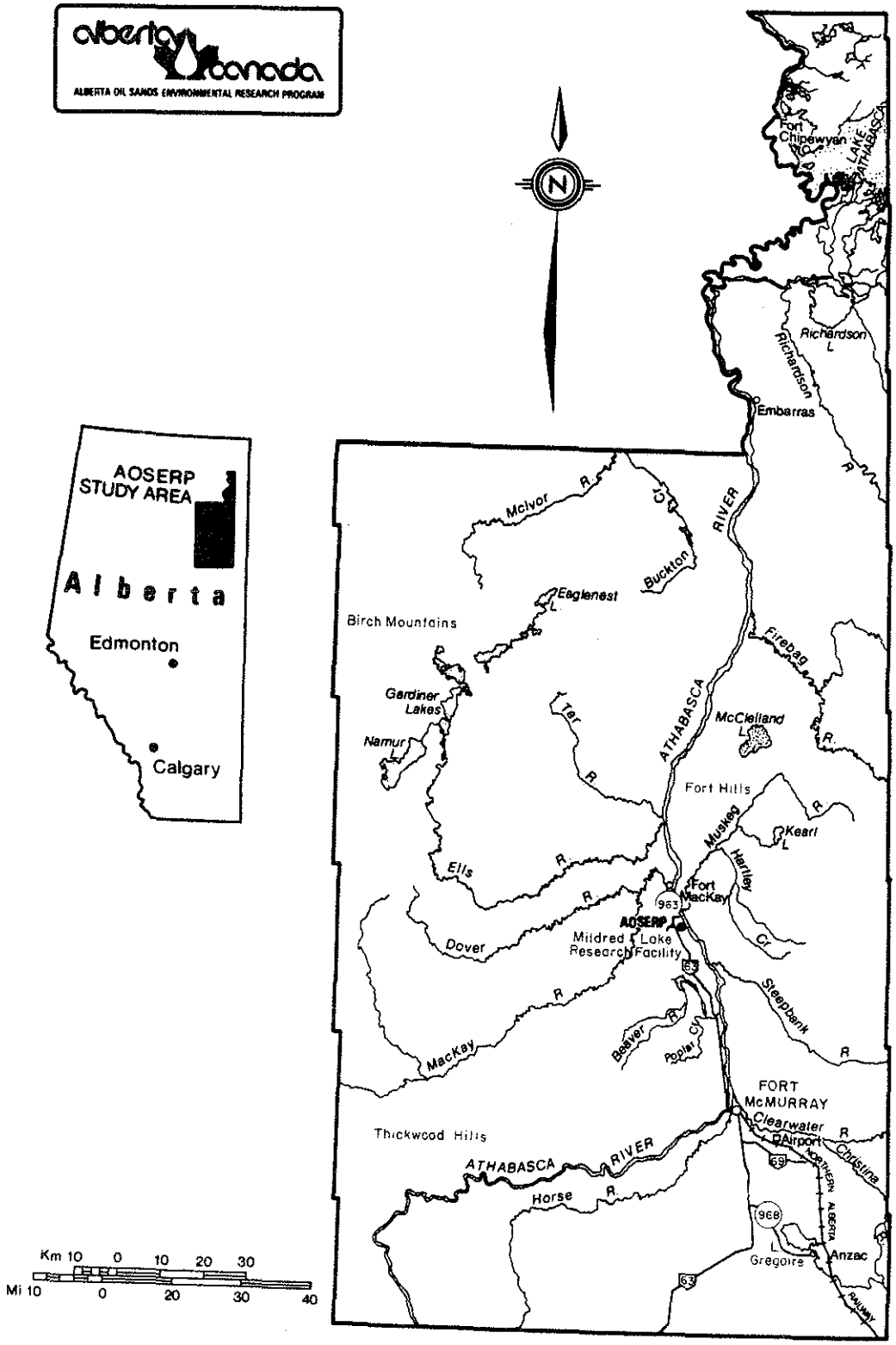

Figure 1. AOSERP study area.

development have generally done so in a summarized or qualitative form.

4. Statistical tabulations are not collected specifically for the Alberta Oil Sands Environmental Research Program (AOSERP) study area, and the overlapping of data collection boundaries causes some difficulties in interpretation. In addition, Canada Census tabulations are undertaken only once in five years and for some important subjects such as employment by occupation and industry, only once in 10 years; accordingly, this periodic information is less than satisfactory in terms of monitoring and evaluating changes in rapidly developing geographic areas such as the AOSERP study area. Some of these statistical inadequacies have been reduced over the past three years by improvements in the amount and quality of data assembled by provincial and local governments and private sources.
5. Another problem that arises from the use of benchmark economic data from different sources is that, even for reports prepared as a series over time, the information may not be derived or presented in a consistent manner and comparative analyses may not always be valid.

The inadequacies inherent in the existing information base are to some degree mitigated by the fact that much of the growth in economic activity has been concentrated in one part of the AOSERP study area, i.e., Fort McMurray and environs, and has been attributable almost exclusively to one basic sector--commercial oil sands exploitation. The study area has undergone two periods of major growth, the first being Great Canadian Oil Sands (GCOS) and the second Syncrude, which account for about two thirds of the 1961 to 1978 time frame; the more recent and more significant impact period marked by the Syncrude development is reasonably well documented with historical data.

For most of the required areas of analysis, the necessary information could be obtained by extracting descriptive and

quantitative data from existing reports, and by supplementing these data with specific enquiries or interviews. Additional sources of raw data included, for example, listings in telephone and local business directories, and unpublished, more detailed tabulations from historical censuses and surveys. Notwithstanding the above research effort, there remain considerable gaps in the available economic data base.

The first sections of this report include a chronological overview of regional and local economic development by major industry (Section 2); a summary of population growth and distribution in the study area (Section 3); an examination of employment patterns and conditions (Section 4); an analysis of the housing market (Section 5); and a discussion of regional incomes and prices (Section 6). These are followed by a more generalized assessment of the impacts of growth at the regional and local levels (Section 7).

Appendix 10.1 was prepared by Carcajou Research Limited and provides a detailed profile of the growth in the local business sector of Fort McMurray and Fort Chipewyan, based on an analysis of telephone and business directories, as well as additional personal enquiries. The analysis contains a considerable amount of information regarding changes in the number of local business establishments by industry sector, and includes some brief textual comments. The final part of the report, Appendix 10.2, includes the annotated bibliography of relevant source documents.

2. CHRONOLOGY OF REGIONAL ECONOMIC DEVELOPMENT

2.1 INTRODUCTION

This section of the report discusses the economy of the AOSERP study area and of selected local communities and sub-regions. Historical developments in each of the major industry sectors are described, and the section concludes with a summary review of changes in the size and structure of the regional economy since 1961.

2.2 PRIMARY INDUSTRIES

2.2.1 Agriculture

The agricultural sector in the AOSERP study area is generally considered to have limited development potential. Current activity is at a modest level and embraces some commercial egg production, privately cultivated vegetable gardens, and some recreational agricultural pursuits such as light horse clubs. No significant changes in the sector have been evident in the time frame being studied (1961 to 1978), and agriculture-related regional employment does not exceed 10 to 20 persons at the present time.

The most important commercial agricultural activity is egg production, with a plant operating in the Fort McMurray area. Since its establishment in 1970, egg production has increased from about 110 000 dozen per year to about 320 000 dozen per year. The plant has expanded and modernized since the early 1970s, but the industry apparently faces high transportation costs (related to the inward shipment of chickens and feed) and local operating costs. The local firm supplies about one half of the regional market while the balance is provided by production sources outside the area. As the plant is largely automatic, there are only two full-time and ten part-time employees at the present time.

2.2.2 Fishing

2.2.2.1 General overview. Commercial fishing operations have been carried out in the AOSERP area throughout the study period, but, for the most part, these activities have been confined to Lake Athabasca. In the early part of the period, commercial fishing also occurred in Richardson Lake, which adjoins Lake Athabasca to the south, and to a much less significant degree in Namur and Gregoire lakes. The activity on Richardson Lake was curtailed after 1966 because that lake was found to be the most important walleye spawning area in the region. Fishing in the other two lakes mentioned also stopped in the mid-1960s.

Commercial fishing on Lake Athabasca is based out of Fort Chipewyan and is still active. Figures showing the annual volume and value of catches from 1961 to 1977 are given in Table 1. The annual catch has averaged 118 000 kg over the period, but volumes in the most recent years, though rising, have been substantially below the long-term average. Notwithstanding this, market prices have increased substantially since 1975 and these increases have served to offset lower volumes in terms of value of output.

The industry is primarily of a seasonal nature, providing short-term employment. The season extends from late May to early June, during the pickerel (walleye) run. Periodic attempts have been made at winter fishing for whitefish, but these efforts have not proven successful due to such factors as distance from processing and marketing facilities and the occurrence of a fish disease that reduces quality. In 1975 the fishing co-operative formed a few years earlier was shut down.

Table 1. Commercial fishing in Lake Athabasca, Alberta, 1961 to 1977[a,b].

Year	Total Weight (kg)	Total Market Value ($)	Average Market Value/kg	Total Value to Fishermen ($)	Number of Licences
1961	80 970	38 457	48¢	12 876	51
1962	146 938	68 443	46¢	23 811	60
1963	92 719	41 967	46¢	14 513	108
1964	176 807	68 806	40¢	27 934	66
1965	128 473	ND	ND	ND	52
1966	141 213	68 375	48¢	24 425	68
1967	108 510	65 090	59¢	22 445	51
1968	226 709	97 910	44¢	40 031	44
1969	161 914	70 425	44¢	33 081	38
1970	108 615	36 734	33¢	27 720	32
1971	89 887	49 406	55¢	30 675	25
1972	131 776	77 434	59¢	48 663	42
1973	134 856	123 936	92¢	53 669	33
1974	131 359	74 411	57¢	22 975	14
1975	22 521	20 455	90¢	5 317	20
1976[c]	49 887	70 240	$1.41	23 096	22
1977[c]	89 987	169 558	$1.89	77 674	40

[a] These data refer to fish caught and reported to Alberta authorities.

[b] Adapted from original table in Department of Recreation, Parks and Wildlife (1976).

[c] Figures obtained from interview with J. Lloyd, Department of Recreation, Parks and Wildlife, 15 November 1978.

2.2.2.2 History. The spring pickerel fishery has been operated out of Fort Chipewyan since 1955. Until the late 1960s, activity followed a reasonably constant pattern. A complete outfit of packer and freezer barges, accompanied by a flotilla of fishing boats, owned by McInnes Products Corporation, based in Waterways, descended the Athabasca River at breakup. The firm operated out of Fort Chipewyan until the pickerel limit was reached and then, or as soon as ice conditions allowed, moved up the lake to the Saskatchewan side to fish for lake trout and whitefish.

Available information indicates that, in the early 1960s, commercial fishing provided a relatively significant amount of seasonal employment to native people in the Fort Chipewyan area. In 1964-1965, about 55 fishermen worked for McInnes Products and an additional 40 to 50 people were involved in fish processing during the summer season. By the late 1960s, however, the local employment impact was quite small, with most participants in the spring fishing activity coming from outside the region.

In 1969, the Freshwater Fish Marketing Corporation was established, and for the next two seasons McInnes continued to buy fish as an agent for the Corporation. About 1971 McInnes withdrew and sold its equipment to fishermen in Saskatchewan. Fishing activity reached a low point in approximately 1970-1971. The volume figures for those years, given in Table 1, mask the fact that walleye catches, which normally comprise the mainstay of the local industry, dwindled to one quarter or less of total output, but greater catches of other species compensated somewhat.

Two developments occurred in the 1971-1972 period. The first was that the Alberta side of Lake Athabasca was closed to outside fishermen. Second, the Fort Chipewyan fishermen formed the Athabasca Fish Co-operative, obtained financing from the Department of Indian Affairs, the Provincial Co-op Activities Branch, and the Corporation, and bought several steel-hulled boats, as well as a full set of packing and freezing equipment.

With the large boats the Fort Chipewyan fishermen were able to expand beyond pickerel fishing and began to take substantial quantities of whitefish, which they shipped up to Gunnar, Saskatchewan.

From the beginning the Co-operative was plagued with difficulties. First, the large boats constituted a technology that was inappropriate to the circumstances: no proper dry-docking and repair facilities; no winter storage; and inexperienced operators. Second, the enterprise was not soundly managed. After some local experiments, an outside manager was brought in, but was not able to remedy the situation. By 1974 the Co-op was in serious financial difficulties and expired after the 1975 season.

Since then, the pickerel fishery has been re-established with direct buying by the Freshwater Fish Marketing Corporation. Fishing is done from skiffs and the fish are dressed, iced down, and flown to Hay River for processing and packaging. Approximately 100 people are currently involved in fishing, washing, cleaning, and dressing on a seasonal basis (Schlader, Freshwater Fish Marketing Corporation, verbal communication, February 1979).

2.2.2.3 Summary. The importance of the commercial fishing industry in the region appears to have gone through a cycle over the period since 1961, starting initially from a fairly prosperous base, declining in relative and absolute importance through the late 1960s and early 1970s, and once again establishing a stronger base to the present time. Earlier organizational difficulties appear to have been corrected and the industry is now benefiting from improved product prices.

The industry is relatively important to Fort Chipewyan residents, for whom it provides a supplementary source of income and employment in an area where unemployment is high and job opportunities scarce. It is nonetheless characterized by its short seasonal nature. The impact of the industry throughout most of the 1961 to 1977 period, in terms of local employment and income, remained virtually unchanged although, for the most recent years for which data are available, output, value of output, and

participation in the industry have increased markedly. In the context of the AOSERP study area as a whole, commercial fishing is insignificant: the average annual market value of output has been less than $75 000 and the income to local fishermen less than one half of that amount. Still, the Fort Chipewyan residents consider fishing as part of their way of life.

2.2.3 Trapping

Information regarding activity levels in the trapping industry is quite limited because of the informal, unstructured, and part-time nature of trapping. Involvement in the industry is considered by many participants to be more a "way of life" than a source of employment and income. Despite evidence of a decline in its importance, trapping is still relatively significant among native people in the AOSERP area outside the Town of Fort McMurray.

In the Fort MacKay and Fort Chipewyan areas, trapping is still an important source of livelihood or, in most cases, a supplemental source of livelihood. A 1974 report prepared by Ekistic Design Consultants Ltd. indicated that nearly all of the adult males in Fort MacKay depend to some extent on trapping for income. A more recent report on Fort MacKay (Van Dyke 1978), which included an employment survey, indicated that 25 out of 50 native male respondents mentioned trapping as a past or present source of employment; and nine of the 23 employed at the time of the survey showed trapping as a source of income. However, the fact that the income received from trapping averaged only $1 250 per annum per Fort MacKay trapper from 1970 to 1975, confirms that trapping generally must be considered a source of supplemental income for persons engaged therein.

A 1971 study (Moncrieff, Montgomery and Associates Ltd. 1971) which covered the Fort Chipewyan, Peace Athabasca Delta, and Lake Athabasca regions (an area which extends beyond the AOSERP region) indicated that about 60% of the male labour force or about 226 persons engaged, at least to some degree, in trapping. That report also estimated that perhaps only 10 to 15% of those could be considered as full season, serious, productive trappers.

In the context of the entire AOSERP study area, however, trapping is relatively insignificant and appears to have generally declined in importance since 1961. There are approximately 130 traplines in the region and the total value of fur production for each of these averaged approximately $160 annually during the period 1971 to 1975 (Todd 1976). Probably 150 to 175 persons in the region depend to some extent on trapping as a source of income and employment and roughly three quarters of the trapping activity is located in the northern part of the region, in the Fort MacKay and Fort Chipewyan areas.

The study of the Fort Chipewyan area cited earlier suggested that, on the basis of available data for the years 1960 to 1970, the income from trapping had declined by about 40% over that 10-year period. A later report, covering the period 1970-1971 to 1974-1975 suggested a continuation of this trend, "as evidenced by increases in both numbers of traplines vacant and reports of nil catches" (Todd 1976). This trend apparently applied to the rest of the province as well, and was attributable to declining interest in trapping due to cyclic declines in numbers of some animals, coupled with disappointingly low prices for certain staple species.

Although more recent information specific to the AOSERP study area is not available, province-wide data suggest that catches and fur values improved significantly in 1976 and 1977 and this may have also extended to a greater level of interest and activity in the northeastern region.

2.2.4 Forestry

The economic activity in this sector appears to have peaked in the late 1960s and early 1970s and to have subsided materially since then. This is borne out by available forestry production statistics given in Tables 2 and 3. Most of the regional production has been in the Fort McMurray area, except early in the 1970s when there was activity near Embarras, southwest

Table 2. Commercial coniferous timber production in the Athabasca Forest[a], 1961 to 1978[b].

Fiscal Year	Volume in m^3 by Forest Management Unit[c]						Total Production (m^3)	Total Value ($)
	A2	A3	A5	A7	A10	A12		
1961-62	0	283 000	1 132 000	0	0	0	1 415 000	0
1962-63	0	283 000	566 000	0	0	0	849 000	0
1963-64	0	33 071	153 153	0	0	0	186 224	20 494
1964-65	91 123	21 745	178 173	0	0	0	291 041	32 471
1965-66	0	13 932	152 859	0	0	0	166 791	18 647
1966-67	0	138 441	124 460	1 473 043	0	0	1 735 944	199 330
1967-68	0	814 754	287 027	1 552 939	0	266 832	2 921 552	347 272
1968-69	501 419	1 208 245	38 785	325 099	0	0	2 073 548	299 523
1969-70	2 027 069	4 700 131	127 553	208 407	0	270 879	7 334 039	1 044 889
1970-71	7 055 181	557 727	159 079	216 305	0	0	7 988 292	1 059 079
1971-72	5 627 092	0	163 905	0	0	0	5 790 997	951 105
1972-73	3 290 746	1 638 869	1 478 799	0	0	0	6 408 414	1 328 838
1973-74	3 884 965	2 291 651	4 364 895	0	0	2 860 365	13 401 876	2 993 800
1974-75	9 169[d]	387 704	107 277	0	0	458 584	962 734	243 295
1975-76	0	175 072	1 267	151 959	0	1 289 786	1 618 084	370 697
1976-77	0	3 803	0	53	101 586	101 732	207 174	60 133
1977-78	0	0	0	227 931	(3 396)	2 210	233 537	79 887

[a] The Athabasca Forest encompasses a larger region than the AOSERP study area. Forest Management Units A1, 3, 4, 5, 7, 8, and 10 are entirely within the AOSERP boundaries while only portions of the other units are included.
[b] Source: Department of Energy and Natural Resources (1978).
[c] Forest Management Units with no production have been eliminated from the Table.
[d] Bracketed figures represent a credit carried from the previous year.

Table 3. Total timber production in the Athabasca Forest[a], 1961 to 1978[b].

Fiscal Year	Commercial		Non-commercial		Total m^3
	Coniferous m^3	Deciduous m^3	Coniferous m^3	Deciduous m^3	
1961-62	1 415 000[b]	0	0	0	1 415 000
1962-63	849 000[b]	0	0	0	849 000
1963-64	186 225	9 678	0	0	195 903
1964-65	291 042	25 269	0	0	316 311
1965-66	166 791	26 811	0	0	193 602
1966-67	1 735 944	24 861	0	0	1 760 805
1967-68	2 921 553	11 274	0	0	2 932 827
1968-69	2 073 549	6 732	0	0	2 080 281
1969-70	7 334 041	0	0	0	7 334 041
1970-71	7 988 297	0	0	0	7 988 297
1971-72	5 790 998	0	3 084	0	5 794 082
1972-73	6 408 668	0	95 651	31 271	6 535 590
1973-74	13 401 878	0	38 995	15 245	13 456 117
1974-75	944 396	0	287 836	24 776	1 257 008
1975-76	1 618 086	0	37 950	3 127	1 659 163
1976-77	207 175	0	135 888	22 852	365 915
1977-78	226 748	0	93 896	1 202	321 846

[a] The Athabasca Forest encompasses a larger region than the AOSERP study area. Forest Management Units A1, 3, 4, 5, 7, 8, and 10 are entirely within the AOSERP boundaries while only portions of the other units are included.

[b] Adapted from original table in Department of Energy and Natural Resources (1978).

of Fort Chipewyan. The annual value of production (commercial coniferous) reached a peak of just under $3 million in 1973-74 and has since declined.

In the northern part of the northeastern Alberta region, a sawmill was operated at Sweetgrass Landing from the mid-1960s until 1973 when it was relocated to Embarras. Swanson Lumber Co. Ltd. employed 138 Fort Chipewyan and Sweetgrass Landing residents in this operation in 1967. By 1970, this had dropped to 70 employees; by 1974, after the move to Embarras, to 40 employees, and this downward trend continued until 1976, when operations ceased entirely. No commercial logging activities have occurred in this area since then.

In the southern part of the AOSERP study area, a sawmill was operated by Primrose Lumber Co. at Fort McMurray until 1970 when it was purchased by Swanson Lumber Co. Ltd. and expanded with a planer mill and kilns. The mill burned down in 1974, but milling operations continued for a short period through use of a contract mill. That operation has not reopened and timbering volume has been significantly curtailed in the area.

A small sawmill has continued to operate in Fort McMurray (Northland Forest Products Co.), but this is a relatively insignificant operation, selling rough timber products to the local and northern markets. Total industry employment now stands at about 10 to 20 persons, compared to a peak of roughly 100 to 125 persons in the late 1960s and early 1970s.

A number of factors have contributed to the general decline of the forestry sector in the AOSERP region. Isolation and poor access hindered the sawmill operation at Embarras and specific problems related to the availability of native contractors and labour from Fort Chipewyan caused that operation to shut down. After the fire which destroyed the Swanson mill at Fort McMurray, a number of considerations apparently affected the decision not to reopen that operation, including: (1) problems associated with continued movement of logs through the community of Fort McMurray where the planer mill and kiln were situated; (2) prospective difficulties anticipated at that time in competing locally for

labour, given the levels of wages and overtime allowances being offered in oil sands construction and related industries; and (3) adverse economics due to the absence of a regional pulp mill, which mitigated against the sale of chips from the sawmill. Lumbering costs in the AOSERP region are relatively high compared to other areas in the province and forest harvesting on a sustained yield basis very low due to climatic and soil conditions, poor quality lumber on the muskeg, distance from markets and poorer accessibility, labour shortages, and high wage rates. These factors make the local forestry industry particularly sensitive to changes in operating conditions.

2.3 MINING AND OIL INDUSTRY

2.3.1 General Overview

The mining and oil industry, as it pertains to commercial oil sands extraction, has been the major source of economic stimulus and growth in the AOSERP study area since 1961 and is the dominant industry in northeastern Alberta. Improvements in technology, increased oil prices, and the desire to reduce a growing national dependency on imported energy have combined to stimulate interest in the commercial development of the Athabasca Oil Sands, which underlie the AOSERP area. The GCOS operation, which has been active since 1967, and the Syncrude development, which only became operational in late 1978, are both based on the open-pit mining of oil sands to recover bitumen which is then upgraded to synthetic crude oil, and the massiveness of those projects has generated significant economic impacts on the region. Bitumen recovery techniques which do not involve open-pit mining are also being tested in the AOSERP area, but these in-situ operations have been of a relatively small and experimental nature and have not yet had significant regional economic implications.

A brief chronology of major oil sands mining developments in the AOSERP region is summarized on the following page:

1960	GCOS applies to Oil and Gas Conservation Board to extract oil from the Athabasca Oil Sands
1963	GCOS receives approval from provincial government for the construction of an oil sands plant 32 km north of Fort McMurray
1964-1967	GCOS construction phase
1967	GCOS plant becomes operational
1973	Proposed Syncrude oil sands development is approved by Energy Resources Conservation Board (ERCB)
1974	Syncrude construction commences
1974-1978	Syncrude construction phase
1978	Syncrude plant becomes operational

2.3.2 Commercial Oil Sands Developments

The first commercial synthetic oil recovery project was developed by GCOS and commenced operations in late 1967. The plant, located some 32 km north of Fort McMurray, had an initial design capacity of 7380 m^3 per day. During the early years of operation, a number of technical difficulties were encountered which required operational and facility modifications, and it wasn't until 1971-1972 that production reached design levels. In 1972 the company applied for approval to increase production to 10 660 m^3 daily and in late 1973 the province of Alberta approved the application. The firm has not yet embarked on the major capital program to expand its facilities, but has attempted to improve output through re-design and de-bottlenecking. Average daily production on an annual basis reached a peak of somewhat more than 8364 barrels in 1972 but has generally averaged about 7380 m^3 since then. GCOS also produces, as a by-product, sulphur in quantities of about 101 604 tonnes annually. Sales of sulphur have fluctuated over the years but have always been far below output and, accordingly, stockpiles of this product continue to grow. Since 1976, shipments of sulphur from the plant have been insignificant. Historical production and revenue figures

for the GCOS project are included in Table 4. With the Syncrude plant only recently in operation, those figures incorporate most of the oil sands-related output of the AOSERP study area since 1961. Notwithstanding relatively stable production levels over the past several years, the value of synthetic oil production has climbed rapidly in response to higher prices of oil. At the beginning of operation, GCOS received less than $3 per barrel for its synthetic crude; this gradually increased to almost $4 in 1973 and to about $6.50 in 1974; by 1977 the average value had reached close to $11 and, in late 1978, GCOS was receiving about $13.30 a barrel for its product. The value of output from the plant is currently in the order of $200 million annually.

The second commercial oil sands plant has been developed by Syncrude Canada Ltd. at Mildred Lake, 40 km north of Fort McMurray. This project has a design capacity of about 125 000 barrels daily, or almost three times the GCOS design output. That capacity is to be achieved in stages, with initial 1978 output at a much lower daily level.

For a region that, in 1961, had a total employed labour force of less than 1000 persons, the impact of the GCOS and Syncrude projects has been enormous. Over the GCOS construction phase, the construction work force reached as many as 2300 (1966). Operating employment at the plant totalled about 150 persons in 1966, had reached about 700 in 1967, and has ranged from 1500 to 1800 persons over the past several years. The Syncrude project has had an even greater impact: the construction period extended over five years with the on-site labour force reaching 8000 men in mid-1977. Operating employment totalled more than 2500 by mid-1978 and is likely to reach more than 3000 when the plant is at full operation.

2.3.3 Experimental Oil Sands Projects

A number of experimental and non-commercial oil sands projects of varying significance have also been developed in or near the AOSERP study area over the past two decades. Table 5

Table 4. Synthetic crude oil and sulphur output of GCOS, 1967 to 1978.

Year	Synthetic Crude[a]		Sulphur[b]		Total Revenue[c] ($)
	Annual Production (000 m^3)	Average Daily Production (m^3)	Production Mg	Shipments Mg	
1967	75	204	ND	ND	1 080 000
1968	939	2572	23 937	5 100	15 655 000
1969	1654	4532	49 101	14 280	28 472 000
1970	1982	5429	48 094	13 668	34 739 000
1971	2549	6982	52 033	7 956	50 724 000
1972	3087	8456	90 770	5 100	63 330 000
1973	3025	8291	105 894	4 590	73 213 000
1974	2768	7585	96 913	55 590	108 128 000
1975	2585	7083	85 295	61 200	124 434 000
1976	2913	7942	104 018	ND	159 827 000
1977	2725	7465	98 300	ND	180 558 000
1978[d]	2679	7347	ND	ND	213 186 000

[a] Adapted from original tables in GCOS Annual Reports (1967 to 1977).
[b] Adapted from original Tables in Energy Resources Conservation Board (ERCB) (1977) and Ross et al. (1976).
[c] Adapted from original tables in GCOS Annual Reports (1967 to 1977).
[d] Adapted from original tables in GCOS (1979).

Table 5. Experimental oil sands projects in the AOSERP study area[a].

Company	Field Area	Location	Active Period or Approval Dates	Comments
A. TERMINATED				
Shell Canada Ltd.	i) West Athabasca ii) Muskeg River iii) Muskeg River	27-95-15W4M 20-95-10W4M 29-95-10W4M	1957 1958-1959 1960-1962	Pilot plant costing $1.8 million, produced 6 250 barrels of oil
Texaco Exploration Canada Limited	i) Asphalt Creek ii) Fort McMurray	1-99-12W4 33-87-9W4	1958 1959	
Pan American Petroleum	Gregoire Lake	5-86-8W4M	1960-1961	
Cities Service Athabasca Inc.	Mildred Lake	93-10W4M	1959-1962	Pilot plant operation culminated in development of Syncrude commercial plant
Mobil Oil Canada Ltd.	Clarke Creek	3-90-9W4	1963-1965	976 barrels of oil recovered
Canadian Fina Ltd.	Steepbank River	20-92-9W4	1966-1970	Total cost $1.6 million
Sun Oil Ltd.	Mildred Lake	22-92-10W4	1967-1970	In situ recovery trials at site of GCOS commercial leases
Tenneco Oil & Minerals	Muskeg River	27-96-7W4	ND	
Atlantic Richfield Co.[b]	Pony Creek	32-79-7W4	1963-1966	Expenditure $2 million
Imperial Oil Ltd.	Mildred Lake	34-92-10W4	1976	
Amoco	Gregoire Lake	27-85-8W4	1958-1977	30 000 barrels of oil produced

continued . . .

Table 5. Concluded.

Company	Field Area	Location	Active Period or Approval Dates	Comments
B. ACTIVE				
Texaco Exploration Canada Limited	Fort McMurray	15-88-8W4	1972-1979	Pilot operations have produced about 50,000 barrels of oil
Amoco	Gregoire Lake	27-85-8W4	1973-1980	Recent completion of large scale pilot to produce up to 1,000 barrels of oil per day
Numac Oil and Gas[b]	Surmont	30-83-6W4	1974-1980	Cost $1.5 million
Petro Canada	Fort McMurray	ND	ND	Scheduled start 1978
Gulf Oil Canada Ltd.[b]	I) Wood River II) Pelican River	6-83-22W4 9-81-22W4	1974-1979 1978	Plant construction and operations cost total $8 million
Union Oil[b]	I) Buffalo Creek II) Chipewyan	5-88-19W4 21-89-21W4	1977-1981 1974-1979	

[a] Adapted from original table in Nicholls and Luhning (1977).

[b] Somewhat outside the AOSERP region.

provides an indication of present and historical experimental project activity in the Athabasca and Wabasca oil sands areas.

The economic impact of these projects has not been of a sustained or significant nature. The most important of the now terminated projects was the pilot plant at Mildred Lake operated by Cities Service Athabasca Inc., prior to development of the commercial Syncrude plant. This pilot operation was designed to produce 1000 barrels per day and employed as many as 150 people. Of the currently active pilot projects, the two most significant are the operations of Texaco Exploration Canada Ltd. (Texaco) and Amoco Canada Petroleum Ltd. (Amoco). The Texaco pilot, located near Fort McMurray, employs about 18 persons on a full-time basis; periodic construction activities have necessitated a modest contract work force for short durations. Amoco's operation employs about 15 full-time workers who reside in Fort McMurray; in addition, another 20 men stay at a site camp and regularly rotate from outside the local area. The construction of that pilot required a labour force over a six-month period which peaked at about 100 men. The Texaco and Amoco facilities are both of an established nature and have increased employment as pilot and experimental phases have expanded.

In the earlier stages of development, local employment of these experimental plants may involve but a handful of men, some only on a seasonal basis. The Union Oil Company of Canada Limited (Union Oil) facility, which is slightly beyond the AOSERP study area, is a case in point -- it operated only seasonally until recently and now employs an average of about eight men who live at the plant site in camps. A construction force of 40 to 50 men may be drawn in when required for short periods. For another experimental project being developed 48 km south of Fort McMurray by a consortium including Petro Canada, a permanent labour force of 15 with a construction force peaking at about 100 is anticipated.

In summary, the impact of these experimental plants on the regional economy has heretofore been relatively small: in some instances the plants have been isolated, self-contained and

serviced from outside the region; in others, the operations have been at an incipient stage of development involving the seasonal or short-term activity of only a few workers; even full-fledged pilot operations may involve the need for only a dozen or more permanent employees. Plant construction and development, while sometimes requiring approximately 100 men, generally extends over a relatively short period.

2.4 TRANSPORTATION, COMMUNICATION, AND UTILITIES

2.4.1 General Overview

A review of the period since 1961 confirms that a remarkable improvement has occurred within the AOSERP study area in terms of the availability and level of transportation, communication, and utilities services and facilities. To some extent, these improvements reflect the generalized enhancement of services and facilities which has occurred throughout the province. Unquestionably, however, the improvements have also been consequential to the direct or induced demands associated with oil sands development in the area. The following sections discuss in some detail the changes which have occurred.

2.4.2 Transportation

2.4.2.1 Introduction. The transportation industry which serves the AOSERP study area has undergone considerable change over the past two decades. Many of these changes accompanied or were precipitated by commercial oil sands development which began in the mid-1960s. In the early 1960s northeastern Alberta was quite isolated and lacking in adequate transportation access. The development of the oil sands projects generated transportation demands for the movement of synthetic crude oil and its by-products out of the region. Demands for the inward transportation of materials and goods for plant construction and supply, for urban and regional infrastructure construction, and for urban resupply

were also stimulated both directly and indirectly by increased oil sands activity.

The study period under review witnessed the construction of two pipelines for the outward shipment of synthetic crude oil and two natural gas pipelines to supply the oil sands plants and urban needs in the Fort McMurray area. Although the northern part of the region still lacks all-weather road access, highways linking the southern part of the region to the rest of the province were constructed in the mid-1960s, and now carry a dominant share of the freight volume going into the area, as well as the majority of inter-regional passenger traffic. Air facilities and services have improved considerably and have captured an important share of passenger traffic, and particularly the non-resident and business travel component. At the start of the review period, Northern Alberta Railways Co. was the primary mover of freight into and out of the region. The railway continues to play an important role, particularly for the inbound movement of equipment and materials during plant construction and the outbound shipment of bulk oil sands by-products, but these freight volumes have shown considerable fluctuations over time. Athabasca River barge transport, an historically important transportation mode, has dwindled in importance and serves largely to link demand in northwestern Saskatchewan with supply sources outside the AOSERP area. Transportation facilities and improvements that were extended to other northern regions have reduced the importance of the Athabasca River link; as well, declining economic activity in the remaining market area served by the barges has caused traffic volume to fall off for several years.

2.4.2.2 Pipelines. During the past decade two pipelines have been built for the purpose of transporting synthetic crude oil produced at the GCOS and Syncrude plants to refineries in the Edmonton area. The pipelines handle almost all the synthetic crude output of the two plants; modest volumes of oil produced at experimental oil sands operations are shipped out of the region by truck.

Two additional pipelines supply natural gas from outside the AOSERP study area to Fort McMurray and the oil sands projects. The first of these pipelines was brought into service in 1967 and provides natural gas to GCOS, the Amoco and Texaco experimental plants, and Fort McMurray. The line also supplied the natural gas requirements of Syncrude during its construction phase, but a new gas pipeline was completed in late 1977 to serve its long-term operating needs.

Natural gas is used by the oil sands plants for hydrogen production, as a fuel for process furnaces or power and steam generation, and during plant start-up and process upset periods.

2.4.2.3 Road transport. At the beginning of the period under review, there was no all-weather road access from the south to the AOSERP study area. It was not until the spring of 1966 that Highway No. 63 linking Edmonton with Fort McMurray was completed. The northward extension of Highway 63 is designated as Highway 963 and serves the GCOS and Syncrude plants and continues north to Fort MacKay. There is no all-weather road access to the northern part of the region, which includes the community of Fort Chipewyan.

Prior to completion of Highway 63, ground transportation to the region was dependent on the railway or on forestry roads for winter access. The construction of the road to Fort McMurray coincided with the development of the GCOS plant, and the highway has since accommodated the significant movements of men and materials which have accompanied regional growth.

There are no records available with regard to the total freight carried inter-regionally by highway, but it is clear that far more freight is carried into the AOSERP area than originates there, and that most inbound cargo is handled by truck as opposed to rail. One report (Stanley Associates Engineering 1975a) estimates that approximately 190 000 tons were moved into the region by truck in 1974 with most of the freight accounted for by consumer goods. Using the results of a trucking survey carried out at an earlier date, another report (Ross et al. 1976) estimated that in

1975 almost 1.1 million tons were moved from the Edmonton region to the Fort McMurray region by truck. There is no explanation for this variation in traffic volume. Based on the traffic figures given in the latter report, the composition of inbound volume is estimated as follows: 46% petroleum products; 42% construction materials; 5% iron and steel pipe; 4% general merchandise and bulk freight; 2% vehicles and machinery; and 1% foodstuffs.

No records of the number of people moving inter-regionally by highway are available but, on the basis of information given in a transportation study of the northeastern region, it is estimated that approximately 215 000 persons travelled to or from the region by automobile in 1975 and another 23 000 by bus (Stanley Associates Engineering Ltd. 1975a). In that same year, slightly fewer than 100 000 air passengers enplaned or deplaned at Fort McMurray; therefore, it appears that approximately 70% of inter-regional passenger traffic is by road.

2.4.2.4 Rail transport. The rail line connecting Fort McMurray and Edmonton was built in the early 1920s and for many years served as the southern link of a northern transportation system comprising the Athabasca and Mackenzie River barge systems. The completion of the Mackenzie Highway and the Great Slave Lake Railway to Hay River began to lessen the importance of the Fort McMurray rail link in the early to middle 1960s. By 1966, the completion of road access to Fort McMurray from the south also began to subject the railway to competition from road transport. The accelerated development in the area spawned by oil sands activity has nonetheless caused the railway to continue to play an important role in the region.

In 1974, the Fort McMurray to Edmonton rail line carried approximately 130 000 tons, and in 1975 almost 200 000 tons. Table 6 summarizes the traffic flows by commodity to and from the region in 1975. In that year, most of the inward freight was accounted for by construction materials and petroleum products;

Table 6. Summary of rail traffic originating and terminating on the Waterways Subdivision of the Northern Alberta Railway, 1975[a].

Terminating on Waterways Subdivision	Mg
General freight	4 896
Construction materials	31 858
Forest products	2 584
Petroleum products	39 913
	79 251

Originating on Waterways Subdivision	Mg
Miscellaneous and agricultural	718
Petroleum products	2 615
Forest products	3 495
Sulphur	92 552
	99 386
Total traffic	178 631

[a] Source: Ross et al. (1976).

most outbound cargo was allocable to bulk sulphur shipments from the GCOS plant.

With the recent completion of the Syncrude project, rail shipments of construction materials and machinery into the region have apparently dropped, but petroleum products (fuel oil and gasoline) remain important. Since 1976, outward shipments from the region have become negligible due to the absence of sulphur movements, but it is expected that these will resume in the future.

Rail passenger volume in the region is relatively insignificant and comprises mostly native people travelling between Lac La Biche and Fort McMurray. Due to continued improvement in air and highway transport services and facilities, together with declining rail services, rail transport no longer plays a meaningful role in the movement of passengers to and from the oil sands area (Stanley Associates Engineering Ltd., 1975). Through service from Edmonton to Fort McMurray is no longer available, and the present twice weekly trip includes an overnight stop at Lac La Biche.

2.4.2.5 Water transport. The Athabasca River transport system, with Fort McMurray as its southern terminus, has historically been an important transport route serving northeastern Alberta, northwestern Saskatchewan, and the far north via the Slave River, Great Slave Lake, and the Mackenzie River. The construction of--and ongoing improvements to--the Mackenzie Highway, and the completion of the Great Slave Lake Railway, caused a diversion of traffic destined for the far north from the Athabasca route in the early 1960s. The completion of highways to Fort Smith served to further divert barge traffic.

Table 7 summarizes the annual cargo volumes handled on the Athabasca Barge System since 1958. Traffic has generally decreased over the past two decades, owing partly to the loss of Mackenzie and far north traffic, and also to the decrease in uranium mining activity in the northwestern Saskatchewan area served by the system. Only in the past two years has barge traffic

Table 7. Annual tonnage handled by Northern Transportation Co. Ltd. on the Athabasca Barge System, 1958 to 1978[a].

Year	Northbound ('000 Mg)	Southbound ('000 Mg)	Total ('000 Mg)
1958	172	13	185
1959	121	8	129
1960	87	17	104
1961	27	11	38
1962	63	14	77
1963	63	12	75
1964	62	13	75
1965	55	8	63
1966	44	12	56
1967	44	11	55
1968	60	12	72
1969	42	11	53
1970	37	17	54
1971	40	14	54
1972	31	13	44
1973	26	4	30
1974	43	16	59
1975	36	3	39
1976	38	6	44
1977	60	5	65
1978	65	4	69

[a] Adapted from original tables in Stanley Associates Engineering Ltd. (1975[b]), Department of Business Development and Tourism. Industry and Resources (1978/79), and letter dated 27 December 1978 from D.S. Robinson, Northern Transportation Company Limited.

shown signs of revival, and this has been largely attributable to renewed uranium activity.

A large and increasing share of the total Athabasca barge traffic is northbound and most of this is destined for the Saskatchewan points of Bushell-Uranium City, Fond du Lac, and Stony Rapids. Bulk fuels, machinery and equipment, and mining materials are destined for the uranium operations and the balance of cargo comprises community resupply requirements, and housing and construction materials such as lumber, cement, and finishing materials. Northbound traffic to Alberta points, primarily Fort Chipewyan, totals about 5000 tons annually and consists of bulk fuel and dry cargo. Southbound traffic has dwindled over the years and now consists largely of shipments of vehicles from the region, fish from Crackingstone Point in Saskatchewan, and empty petroleum drums. Until the early 1970s lumber from Sweetgrass Landing and later from Embarras was also shipped south, but forestry operations in that area have since ceased.

Of the cargo moving by barge on the Athabasca, the only goods of any significance that are produced in the AOSERP study area consist of fuel products from GCOS and rough lumber from the remaining Fort McMurray sawmill for use in uranium operations. Most barge traffic handled through Fort McMurray is intermodal and inter-regional; that is, it is transferred from or to rail and highway carriers and it originates from or is destined for points outside the study area.

The barge season extends from about May to September and employment is accordingly of a seasonal nature. Employment remained generally constant for several years until 1976 when the work force was expanded by 20%. The work force operating from Fort McMurray totalled about 55 persons in 1978, including 30 men working on barges and about 25 shore personnel. Of that total, about 40 men are permanent residents of Fort McMurray.

2.4.2.6 Air transport. Air traffic to and from the AOSERP study area and also intra-regional traffic (primarily Fort McMurray to Fort Chipewyan) has increased significantly in importance over the period since 1961.

Table 8 provides an indication of the growth in number of air passengers between Fort McMurray and Edmonton; from 1963 to 1977 the number of passengers increased from about 5000 per year to 145 000. The growth during that period was not uninterrupted: passenger movement peaked during the GCOS construction phase and declined thereafter until renewed oil sands activity in the 1970s regenerated growth. It has been estimated that 90% of this air passenger travel comprises movements of non-residents (Co-West Associates 1978).

With no rail or all-weather road connecting it to the south, and only summer barge traffic on the Athabasca available to move bulk commodities, Fort Chipewyan relies heavily on air service to move passengers and cargo in and out (see Table 9). An airport was completed there in 1967 and scheduled service began in 1973.

The regional volume of cargo and mail carried by aircraft has also risen sharply over the years, with a much higher portion of cargo destined for, rather than originating in, the region. In absolute terms air cargo comprises a small part of the total movement of goods to and from the region, totalling only about 650 tons (cargo plus mail) in 1977. Cargo moved by air consists largely of high-value, delivery-sensitive goods.

2.4.3 Communication

Communication facilities and services in the AOSERP study area have been considerably expanded and improved since the early 1960s. Telephone service has generally been available in Fort McMurray and Fort Chipewyan throughout the study period and has grown substantially as shown in Table 10; in the smaller settlements such as Anzac and Fort MacKay the population is still dependent on the use of a few local radio telephones and, in the case of Anzac, on a public coin-operated telephone.

Table 8. Regional air passenger travel between Edmonton and Fort McMurray, 1963 to 1977[a].

Year	Number of Passengers Enplaned and Deplaned
1963	5 083
1964	13 453
1965	25 000
1966	41 000
1967	24 000
1968	18 000
1969	14 000
1970	10 000
1971	12 000
1972	15 195
1973	31 499
1974	67 970
1975	97 100
1976	121 978
1977	145 304

[a] 1963-1964 figures from Department of Industry and Resources (1965). 1965-1972 figures from Reid, Crowther and Partners Ltd. (1973). 1973-1977 figures from telephone communication with official of Transport Canada, 17 January 1979.

Table 9. Aircraft movement statistics, Fort McMurray and Fort Chipewyan, 1964 to 1977[a].

Year	Fort McMurray			Fort Chipewyan		
	Local	Itinerant	Total	Local	Itinerant	Total
1964	ND	4 483	4 483	ND	ND	ND
1965	90	5 594	5 684	ND	ND	ND
1966	ND	4 743	4 743	ND	ND	ND
1967	5 010	4 230	9 240	ND	ND	ND
1968	2 028	5 083	7 111	ND	ND	ND
1969	2 218	4 345	6 563	ND	ND	ND
1970	5 441	4 397	9 838	ND	ND	ND
1971	4 045	5 439	9 484	ND	ND	ND
1972	5 460	5 084	10 544	ND	ND	ND
1973	5 894	8 502	14 396	1477	1628	3105
1974	20 365	7 837	28 202	2565	2889	5454
1975	9 636	11 771	21 407	2197	3317	5514
1976	21 821	24 205	46 026	2733	3480	6213
1977	31 660	20 781	52 441	2606	3033	5639

[a] Figures from telephone communication with official of Transport Canada, 17 January 1979.

Table 10. Number of telephones in Fort McMurray and Fort Chipewyan, 1961 to 1978[a].

Year	Fort Chipewyan			Fort McMurray		
	Residential	Business	Total	Residential	Business	Total
1961[b]	NA	NA	NA	ND	ND	209
1962[b]	NA	NA	NA	174	52	226
1963[b]	NA	NA	NA	183	62	245
1964	52	15	67	236	99	335
1965	50	17	67	390	184	574
1966	56	20	76	546	215	761
1967	53	24	77	991	247	1 238
1968	45	25	70	1 202	271	1 473
1969	48	30	78	1 253	288	1 541
1970	53	28	81	1 356	296	1 652
1971	55	29	84	1 595	331	1 926
1972	60	33	93	1 811	420	2 231
1973	65	37	102	2 056	575	2 631
1974	70	36	106	2 585	845	3 430
1975	90	39	129	3 705	1 079	4 784
1976	98	38	136	4 544	1 241	5 785
1977	106	46	152	6 237	1 500	7 737
1978	104	40	144	7 139	1 736	8 875

[a] Source: Interview with P. De Voss, Alberta Government Telephones, 25 January 1979.

[b] Fort Chipewyan received telephone exchange in 1964.

In 1965, radio service to the region was still dependent on reception from Edmonton stations, and that was unreliable. By 1973, Fort McMurray had a local station and a CBC repeater station, which made Edmonton programming available. As of 1978, Edmonton FM radio service is also available. Similarly, there was no regional access to television as recently as the late 1960's. Today, six channels are available in Fort McMurray, including four through cable connections. Television, via satellite, was introduced to Fort Chipewyan in late 1976. In the smaller settlements, reception may be uncertain without individual antennas.

Regular mail service is available in the three largest urban centres of the study area: Fort McMurray, Fort Chipewyan, and Fort MacKay. Anzac residents must collect or deliver their mail at Fort McMurray.

2.4.4 Utilities

2.4.4.1 Power. At the beginning of the period under review, the electrical power needs of the AOSERP study area were quite small and were provided by local diesel generating facilities located at each of the urban communities, including Fort McMurray, Fort Chipewyan, and Fort MacKay. At the time its oil sands plant was developed, GCOS built its own 65 MW power generating facility, fuelled by coke and process gas. During the initial stages of construction at GCOS, a line was installed to the site supplying power from Fort McMurray. Over time, distribution lines were extended to connect Fort McMurray, GCOS, Fort MacKay, and Anzac although each of those was virtually self-sufficient in terms of generating capacity. During the early phase of the Syncrude construction project, the intra-regional distribution line was extended there also.

Within the past two years, Syncrude has completed construction of a 200 MW power station, based on natural gas feedstock, which will make that operation also virtually self-sufficient in power supply. At the same time, a 240 KW transmission line has been extended to Syncrude and Fort McMurray and which, for the first time, links the area with the provincial

power grid. The Syncrude plant has been tied to the grid to meet seasonal peaks in requirements, unusual power swings, and start-up and emergency needs. The availability of power supplies from the grid means that the use of the local generating facilities at Fort McMurray, Anzac, and Fort MacKay will be limited to emergency or peaking purposes. Fort Chipewyan is not yet tied to the provincial grid.

In summary, sufficient power generating capability has been developed within the region to make resource industries there virtually self-sufficient, but the extension of the provincial grid to the area has minimized the usage of local facilities to meet urban requirements.

2.4.4.2 Natural gas. The construction of gas pipelines into the region to serve oil sands plant requirements permitted natural gas distribution service to be provided to Fort McMurray in 1968. Natural gas service is not available to the smaller urban settlements in the northern part of the AOSERP study area.

2.4.4.3 Water supply and sewage disposal. Fort McMurray has had a piped water distribution and public sewerage system for many years, and that system has been continually upgraded and expanded to meet the needs of its growing population. The standards of service in the smaller settlements elsewhere in the AOSERP study area remain quite low. Fort Chipewyan has a water treatment and supply system serving only major facilities and a few individual residences, but most households either have water delivered by truck or use private wells; the community has no public sewerage system. Fort MacKay relies largely on water trucked from Fort McMurray into holding tanks, from which it must then be hauled to the individual residences; in Anzac there are a few community wells from which water can be obtained. Neither of these settlements has a public sewerage system.

2.5 MANUFACTURING

Manufacturing statistics covering Census Division 12, which encompasses a much larger area than the AOSERP study area, indicate that the related number of manufacturing establishments has remained virtually unchanged from 1961 to 1975. Although manufacturing employment tripled during that period, in 1975 it still remained under 300 persons, a relatively insignificant number. Most of the establishments were concentrated in the food, beverage, and wood industries, although there were a few manufacturing firms involved in printing and publishing, furniture and fixtures, metal fabricating, and the non-metallic mineral products sectors.

Within the AOSERP area itself, the manufacturing industry, which is very small, is located entirely within Fort McMurray[1]. Statistical information for the town regarding number of manufacturing establishments, employment, and value added, although sketchy, is summarized in Table 11. The four manufacturing establishments reported in 1977 served exclusively local requirements and included a cement ready-mix plant, a bakery, and two printing or publishing outlets. Available data suggest that employment in the sector generally has increased over the past decade or so, but has stabilized or in fact declined somewhat in the past three years. Employment may have reached a peak of 75 to 90 persons in the 1973 to 1975 period before plateauing at a current level estimated to be about 50 persons. The reduction from 1975 levels appears to be attributable to the closure of the Swanson Lumber Co. Ltd. sawmill.

The manufacturing industry has definitely declined in relative importance within the AOSERP area over the study period: in 1961 manufacturing employment comprised almost six percent of

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[1] Statistics indicate that Improvement District No. 18, outside Fort McMurray, contained one manufacturing establishment in 1975, a sawmill. It is possible that this was the Embarass sawmill, which is no longer operating.

Table 11. The manufacturing industry in Fort McMurray, 1971 to 1977[a].

	1971	1972	1973	1974	1975	1977
Establishments	3	3	4	ND	5[b]	4
Employees	ND[c]	25[d]	73[e]	ND	92	ND
Value Added	ND	$354 000	$1 221 000	ND	$1 764 000	ND

[a] Adapted from original tables in Department of Business Development and Tourism (1978[a]), Department of Industry and Development (1964 to 1975) and Dominion Bureau of Statistics. Manufacturing industries of Canada: geographical distribution (1970 to 1974).

[b] Includes bakery, sawmill, commercial printing firm, publishing/printing firm, ready-mix cement plant.

[c] Comprises 1 firm with 0 to 4 employees, 2 firms with 5 to 9 employees.

[d] Comprises 3 firms with 5 to 9 employees.

[e] Comprises 2 firms with 5 to 9 employees, 1 firm with 20 to 49 employees, and 1 firm with 50 to 99 employees.

the Fort McMurray labour force; by 1978, the equivalent figure was less than one-half of one percent.

2.6 CONSTRUCTION

By its very nature the construction industry must station itself where construction activity occurs; the industry is quite mobile and fluid, and this is illustrated by examining its economic participation in the AOSERP study area over the years. The influence of construction activity has been felt particularly in the Fort McMurray area, where the major direct and indirect effects of oil sands development activity have been concentrated. The magnitude of the resource projects necessitated a tremendous mobilization of construction manpower from beyond the immediate region; those requirements were further compounded by the necessary and attendant urban and regional infrastructure development.

Field research has been carried out as part of this project to amplify the amount of information available regarding the growth of the local business sector in Fort McMurray, including the construction industry, and that information is discussed at some length (Appendix 10.1). In 1963, just prior to the start of GCOS construction, only five establishments involved in contracting and related services were located in the town. At the peak of the GCOS construction period, the number had increased to 27; that number decreased to 20 firms in 1970, and once more began to accelerate, to a 1978 level of over 200 firms. The proportion of the local business sector accounted for by the construction industry increased from less than 20% in 1973 to a peak of 37% in 1976; the current figure is 35%. It is not yet clear to what extent the number of contracting firms will decline in absolute terms in the near future with the Syncrude plant now in operation and much of the urban and regional support infrastructure in place, but in relative terms its importance will likely diminish as the retail and service trade sector continues to grow.

The changing importance of the construction industry in Fort McMurray became evident also by reviewing labour force census data for the community (Municipal Census 1977-1978): the proportion of the labour force employed in the construction industry rose from 6.2% in 1961 to 12.6% in 1971, peaked at 35.4% in 1977, and declined to 18.3% in 1978. Provincially, the average proportion is in the order of 9% per annum. Those percentages exclude the substantial numbers of workers who were domiciled at the nearby GCOS and Syncrude construction camps; if the entire labour force in the Fort McMurray area (including the camps) is considered, the construction industry accounted for more than 60% of employment in 1977 and somewhat less than 30% in 1978. Construction employment in the area is expected to continue to subside until further resource projects are announced.

2.7 RETAIL AND SERVICE TRADE

2.7.1 General Overview

Retail trade is defined to include businesses engaged primarily in selling merchandise to final users; service trade includes businesses engaged in providing a service to the public for a fee. The latter sector would include amusement and recreation services, personal services, accommodation and food services, and miscellaneous categories such as repair outlets.

Retail and service trade activity in the AOSERP study area is largely concentrated in Fort McMurray and, to a much less important degree, in Fort Chipewyan and Fort MacKay. Statistics prepared for the years 1974 and which covered an area somewhat beyond the AOSERP boundaries [Improvement Districts (I.D.) 121, 143 and 150] show that Fort McMurray accounted for 93.8% of retail and service trade in that defined area, Fort Chipewyan 4.1%, Fort MacKay 0.6%, and the remainder of the area 1.5%. Growth in regional retail and service activity has been rapid, and much of that growth has occurred in Fort McMurray. During the period for which data are available, 1969 to 1976, annual retail and service

trade volume in Fort McMurray increased from about $8 million to $95 million.

2.7.2 Retail Trade Activity

A measure of the growth in retail trade activity in Fort McMurray and the AOSERP study area generally can be discerned from an examination of annual retail trade surveys carried out by the Alberta Bureau of Statistics, and summarized in Table 12. The table provides data for the period 1970 to 1976. During that time, retail receipts in the town increased by an average of 60% per year. Growth in retail activity is particularly pronounced from 1973, when preparation for the Syncrude project became more evident. After 1973 retail receipts almost doubled each year. The table also shows receipts for a wider region extending somewhat beyond the AOSERP area; most of the increase in volume for that area is allocable to Fort McMurray, which comprised an average of 90 to 95% of the regional activity.

A segregation of retail trade receipts in Fort McMurray by kind of business is given in Table 13, although in some instances, where disclosure would conflict with confidentiality guidelines, figures have been suppressed. The figures in the table suggest that, over the time frame shown, general merchandise and clothing sales have taken a consistently smaller share of the retail dollar in the town; automotive receipts, which accounted for 15 to 20% of retail spending for the period 1971 to 1975 jumped sharply in 1976 to 31.6%. The relative importance of business equipment and supplies volume appears also to have increased in the most recent years shown.

A comparison of retail activity by category between Fort McMurray and the province is given in Table 14. The disproportionate increase in per capita retail volume which occurred in Fort McMurray in 1976 was primarily attributable to food and automotive expenditures, and the sharp growth in sales of those components may have been related to construction camp employment nearby (the per capita figures are derived only from the population of the town). In

Table 12. Regional retail trade statistics, 1970 to 1976[a].

Year	Improvement Districts[b] 121, 143, and 150	Fort McMurray			
	Receipts ($'000)	Receipts ($'000)	No. of Outlets	No. of Employees	Payroll ($'000)
1970	5 617	4 926	23	ND	ND
1971	8 931	8 221	36	193	962
1972	11 970	11 038	44	220	1 336
1973	14 539	13 333	53	247	1 613
1974	25 024	23 581	58	357	2 594
1975	ND	43 552	68	479	4 890
1976	ND	90 215	104	870	9 333

[a] Source: Adapted from original tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975, 1976).

[b] Boundaries do not coincide exactly with the AOSERP study area, but encompass a somewhat larger area.

Table 13. Composition of retail trade receipts, Fort McMurray, 1971 to 1976[a].

	1971		1972		1973		1974		1975		1976	
	Receipts ($'000)	%	Receipts ($'000)	%	Receipts ($'000)	%	Receipts ($'000)	%	Receipts ($'000)	%	Receipts ($'000)	%
Food	ND	ND	ND	ND	2,597	19.5	4,946	21.0	7,319	16.8	17,850	19.8
General Merchandise	2,204	26.8	2,931	26.6	3,144	23.6	3,829	16.2	5,781	13.3	8,138	9.0
Automotive	1,513	18.4	2,245	20.3	1,828	13.7	3,654	15.5	6,846	15.7	28,536	31.6
Clothing	417	5.1	ND	ND	590	4.4	797	3.4	1,001	2.3	ND	ND
Hardware and Home Furnishings	ND	ND	733	6.6	928	7.0	3,071	13.0	4,011	9.2	ND	ND
Business Equipment and Supplies	NA[b]	NA	NA	NA	1,074	8.0	1,730	7.3	10,151	23.3	15,689	17.4
Miscellaneous Retail	1,959	23.8	2,381	21.6	3,172	23.8	5,554	23.6	8,442	19.4	14,140	15.7
Total	8,221	ND[c]	11,038	ND[c]	13,333	100.0	23,581	100.0	43,552	100.0	90,215	ND[c]

[a] Adapted from original tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975, 1976).

[b] In 1971 and 1972, Business Equipment and Supplies are included in Miscellaneous Retail.

[c] Does not add up to 100% because categories shown ND are not identified separately but are included in grand total.

Table 14. Comparative levels of retail trade volume by category, Fort McMurray and Alberta, 1971 to 1976[a].

Receipts/Capita	1971	1972	1973	1974	1975	1976
Food						
1) Fort McMurray	ND	ND	319	518	546	1,157
2) Alberta	288	316	347	419	453	527
Ratio (1)/(2)	ND	ND	.92	1.39	1.21	2.20
General Merchandise						
1) Fort McMurray	322	410	386	401	432	528
2) Alberta	341	385	465	568	675	843
Ratio (1)/(2)	.94	1.06	.83	.71	.64	.63
Automotive						
1) Fort McMurray	221	314	224	383	511	1,850
2) Alberta	536	611	723	915	1,098	1,299
Ratio (1)/(2)	.41	.51	.31	.42	.47	1.42
Clothing						
1) Fort McMurray	61	ND	72	84	75	ND
2) Alberta	75	84	91	109	138	183
Ratio (1)/(2)	.81	ND	.79	.77	.54	ND
Hardware and Home Furnishings						
1) Fort McMurray	ND	103	114	322	299	ND
2) Alberta	93	113	147	182	220	284
Ratio (1)/(2)	ND	.91	.78	1.77	1.36	ND
Business Equipment and Supplies[b]						
1) Fort McMurray	NA	NA	132	181	758	1,017
2) Alberta	NA	NA	393	528	662	1,012
Ratio (1)/(2)	NA	NA	.36	.34	1.15	1.00
Miscellaneous Retail						
1) Fort McMurray	286	333	389	582	630	917
2) Alberta	559	629	364	411	488	644
Ratio (1)/(2)	.51	.53	1.07	1.42	1.29	1.42
All Categories						
1) Fort McMurray	1 201	1 544	1 636	2 471	3 252	5 849
2) Alberta	1 893	2 140	2 531	3 132	3 734	4 684
Ratio (1)/(2)	.63	.72	.65	.79	.87	1.25

[a] Adapted from tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975).

[b] In 1971 and 1972 Business Equipment and Supplies are included in Miscellaneous Retail.

1973, local per capita receipts for food and automotive outlets were 92% and 31% respectively of provincial averages; by 1976 corresponding sales had increased to 220% and 142% of Alberta norms. Although the automotive category includes tire and battery stores, service stations, motor vehicle dealers, and repair shops, it is evident tnat much of the sharp increase in sales in 1976 was attributable to motor vehicle sales, which accounted for more than two thirds of total sales in the category in that year.

During the years for which retail trade data are available, per capita sales of general merchandise and clothing in Fort McMurray appear to have lagged substantially behind provincial levels; by 1976 they averaged about one half to two thirds of Alberta per capita figures. This may be due partly to different local consumption patterns, but it probably also means that significant purchases of general merchandise (department store-type goods) and apparel and accessories were made outside the local community. A survey carried out in early 1975 showed that one quarter of Fort McMurray households purchased more than one half of their clothing needs outside the community; the overall average of total clothing sales made within the community was about 70%, which roughly corresponds to the 1974 to 1975 per capita ratios given in Table 14 (Harries 1975). At the same time, approximately 97% of the food purchases of Fort McMurray were made locally.

Under the hardware and home furnishings category, Fort McMurray per capita sales have also exceeded provincial averages in the most recent years for which such information can be derived. However, the shopping survey cited previously indicated that, on average, only about 55% of major appliances and furniture purchases by households were made locally. A number of factors could explain the discrepancy, including the fact that many purchases may have been accounted for by builders and contractors not covered in the survey, rather than by individuals for their own purposes. Also, given the large amount of new housing development in the town, it could be that, even with a large share of retail expenditures

diverted outside the region, residual volume in the town may have been sufficiently large to exceed the provincial average.

Local receipts of business equipment and supplies outlets also jumped sharply in 1975, to a level above the provincial average. This category includes a number of components such as building materials and the increase in local sales in 1975 was probably related to the high level of construction activity in Fort McMurray.

The miscellaneous retail category includes such outlets as drug stores, book and gift shops, recreation equipment stores, and liquor stores, and the relative volume of activity of these outlets increased also, from about 50% of the provincial average in 1972 to more that 140% in 1976. It appears that about 80% of the difference between Fort McMurray and provincial retail spending levels in the miscellaneous category is accounted for by relatively higher local sales of liquor store outlets and mobile home and trailer dealers in the town.

Table 15 compares the relative level of retail trade activity in Fort McMurray with the province on the basis of a number of indices. The following observations are of note in respect to that table:

1. Except in 1974, when the number of outlets jumped sharply in Fort McMurray (perhaps in anticipation of increased Syncrude activity), the number of outlets and employment per 1000 population in the town has lagged behind provincial averages. In the last year for which statistics are available, 1976, it appears that the gap with average provincial figures began to close.
2. Increasing local retail demand, which began to accelerate in 1974, was met initially through the increased number of outlets and, thereafter, primarily through increased sales turnover in available outlets. In 1976, sales turnover per outlet exceeded the provincial average by more than 50%.

Table 15. Comparative levels of retail trade activity, Fort McMurray and Alberta, 1969 to 1976[a].

	1969	1970	1971	1972	1973	1974	1975	1976
Receipts/Outlet ($'000)								
1) Fort McMurray	216	214	228	251	252	333	640	867
2) Alberta	240	237	261	291	340	412	494	560
Ratio (1)/(2)	0.90	0.90	0.87	0.86	0.74	0.81	1.30	1.55
Employees/1,000 population								
1) Fort McMurray	ND	ND	28.1	30.8	30.3	37.4	35.8	56.4
2) Alberta	42.6	40.7	42.2	45.0	48.2	56.2	56.8	63.7
Ratio (1)/(2)	ND	ND	0.67	0.68	0.63	0.67	0.63	0.89
Outlets/1,000 population								
1) Fort McMurray	5.2	3.8	5.3	6.2	6.5	8.1	5.1	6.7
2) Alberta	7.6	7.2	7.3	7.4	7.4	7.6	7.6	8.4
Ratio (1)/(2)	0.68	0.53	0.73	0.84	0.88	1.07	0.67	0.80
Receipts/Capital ($)								
1) Fort McMurray	1128	803	1201	1544	1636	2471	3252	5849
2) Alberta	1838	1670	1893	2140	2531	3132	3734	4684
Ratio (1)/(2)	0.61	0.48	0.63	0.72	0.65	0.79	0.87	1.25

[a] Adapted from tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975, 1976).

3. Retail sales per capita jumped sharply in 1976, and this is perhaps explained by the large construction camp force located near Fort McMurray which undoubtedly generated considerable retail demand in the town. In 1976, net sales per capita in Fort McMurray were 25% higher than the provincial average.

The relatively small number of retail outlets in the town in 1976, taking into account the various indices shown in Table 15, may have been corrected in the past two years. Since 1976, the number of outlets in the town has increased by 80%, with particular growth in terms of food, automotive, clothing, arts and crafts, and furniture and appliance outlets.

Appendix 10.1 discusses in greater detail some of the changes that have occurred in the number and composition of retail outlets in Fort McMurray over the study period.

2.7.3 Service Trade Activity

Table 16 provides statistical data respecting historical service trade volume in Fort McMurray and for a larger geographic area which encompasses the AOSERP area. During the eight-year period for which volume figures are given, service receipts increased by about 23% per year. Receipts fell from 1969 to 1971, and that drop may have been accounted for by the completion of the GCOS project and the consequent drop in the accommodation and food service needs of a temporary and construction-related employment force. Accommodation and food service outlets have accounted for 85 to 90% of service receipts in Fort McMurray, somewhat above the provincial level.

Comparative levels of service trade activity for Fort McMurray and Alberta are shown in Table 17. In terms of average receipts per outlet, the figures for the town have hovered near the provincial level. Indices which measure the relative importance of the industry, such as employment and outlets and receipts per capita, clearly show that the local service trade sector is undeveloped in a provincial context. In 1976, the latest

Table 16. Regional service trade statistics, 1969 to 1976[a].

Year	Improvement Districts 121, 143, 150[b]	Fort McMurray			
	Receipts ($'000)	Receipts ($'000)	No. of Outlets	No. of Employees	Payroll ($'000)
1969	1 347	1 234	17	ND	ND
1970	1 221	1 055	14	ND	ND
1971	1 210	985	12	62	260
1972	1 484	1 342	16	79	267
1973	2 064	1 831	18	111	414
1974	2 310	2 066	19	111	473
1975	ND	3 289	21	169	736
1976	ND	5 355	36	199	1 070

[a] Adapted from tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975, 1976).

[b] Boundaries do not coincide exactly with the AOSERP study area, but encompass a somewhat larger area.

Table 17. Comparative levels of service trade activity, Fort McMurray and Alberta, 1969 to 1976[a].

	1969	1970	1971	1972	1973	1974	1975	1976
Receipts/Outlet ($'000)								
1) Fort McMurray	73	75	82	84	102	109	157	149
2) Alberta	62	72	75	86	97	115	144	170
Ratio (1)/(2)	1.18	1.04	1.09	0.98	1.05	0.94	1.09	0.88
Employees/1,000 population								
1) Fort McMurray	ND	ND	9.1	11.1	13.6	11.6	12.6	12.9
2) Alberta	19.2	15.5	15.5	16.4	22.0	20.7	21.8	25.9
Ratio (1)/(2)	ND	ND	0.59	0.68	0.62	0.56	0.58	0.50
Outlets/1,000 population								
1) Fort McMurray	2.9	2.3	1.8	2.2	2.2	2.0	1.6	2.3
2) Alberta	3.3	2.8	2.7	2.6	2.8	2.7	2.7	3.0
Ratio (1)/(2)	0.88	0.82	0.67	0.85	0.79	0.74	0.59	0.77
Receipts/Capita ($)								
1) Fort McMurray	208	172	144	188	225	217	246	347
2) Alberta	203	199	205	224	269	314	390	510
Ratio (1)/(2)	1.02	0.86	0.70	0.92	0.84	0.69	0.63	0.68

[a] Adapted from original tables in Bureau of Statistics. Retail and service trade statistics (1969-1972, 1973, 1974, 1975, 1976).

year for which such information is available, the number of employees was one half, the number of outlets three quarters, and the volume of receipts two thirds of the provincial average.

As with the retail sector, which also lagged in development as measured by provincial norms, there is further evidence (Appendix 10.1) that in the past two years the local service trade sector is catching up. Increases in the number of establishments have been particularly noticeable in respect to recreation services, miscellaneous personal services, restaurants, and services to homes.

2.7.4 Summary

Well over 90% of the retail and service trade activity in the AOSERP study area is concentrated in Fort McMurray and that industry sector has grown rapidly over the study period. The number of retail outlets in the town increased from seven in 1963 to about 50 in 1970 to 1971, doubled again to 100 in 1976, and by 1978 had reached 180. Service outlets have also expanded rapidly, in response to the growth in the local economy over the past decade.

Excepting the impact of the outlying oil sands camp population on the town during construction phases, Fort McMurray has only a modest trading population outside its boundaries from which to draw.

The availability of statistical data relating to the retail and service trade sector in Fort McMurray is quite poor prior to about 1971. An analysis of the data for the years since then suggests that, despite the rapid increase in outlets and trade volume, supply by the sector did not meet demand during the peak stages of the Syncrude construction period. Some possible explanations can be offered, but these are only hypotheses: unpreparedness of the industry to respond to the magnitude of local impact; unavailability of local facilities; inflated costs of land, labour, and materials, and the effect on set-up and operating costs; and operating effects of manpower shortages and labour turnover.

By 1976, Fort McMurray had only 80% of the number of retail outlets that would have been considered average for a community of its size in the province, yet per capita receipts in the town were 25% above the provincial norm and local outlets that were in operation were generating sales more than 50% above the averages elsewhere in Alberta. Although sales figures are not yet available for 1977 and 1978, the increase in the number of retail outlets suggests that pressures on individual outlets may have abated and that a wider selection and more competitive market is being established. Industry employment data available from 1977 and 1978 municipal censuses also suggest that the relative importance of the retail and service trade sector is now moving back to levels that prevailed in 1971.

In the service trade category, the level of activity in the town, by all indices, has been below provincial averages and, unlike the retail sector, pressures on existing outlets have not been evident in the period to 1976. It may be hypothesized that the low service trade volumes are a reflection of different expenditure preferences or, perhaps more likely, that expenditures for such services were avoided in the absence of available local facilities or were directed to communities such as Edmonton on trips outside the region. As discussed in Appendix 10.1, the number of service trade outlets in Fort McMurray has risen sharply since 1976, and this may induce trade volumes to approach more normal levels.

2.8 GOVERNMENT SERVICES

2.8.1 Fort McMurray

Historical census data that are available indicate that government administration has taken an increasingly important share of the Fort McMurray economic base since 1971, as measured by employment. From 1971 to 1978, employment under Standard Industrial Classification Division 10, which includes public administration at the federal, provincial, and municipal levels

(but excludes local public service employees at Keyano College, the Alberta Liquor Control Board, the Treasury Branch, and in the public health field, for example), increased from 4.8% to 6.5% of the local labour force. The most recent municipal census suggested an approximate ratio of 1:2:2 in the number of federal, provincial, and local government employees.

In Table 18, figures relating to public service employment in the town are given, but they have been derived from a number of sources and should serve to provide only a rough guide as to the growth and composition of sector employment.

During the period for which data are available, 1971 to 1978, local employment of both the municipal and provincial governments increased rapidly, although the number of municipal employees increased at almost double the rate of the senior government (30% versus 18% per annum). The provincial government sector in the town increased at a rate below the local population growth, while the number of people working for the municipality increased at a substantially faster pace than the population. The growth in the public administration sector reflects both the rapid growth of the town and the demands for a higher level and broader range of services. In 1964, the provincial government was represented locally by Alberta Government Telephones, and the Departments of Lands and Forests, and Industry and Development. Today 16 provincial departments with such concerns as environment, justice, health, social services, recreation, and housing are located in the town.

Although no historical figures for federal government employment are available, the increased involvement of that level of government is evident from the broader range of departments operating in Fort McMurray. In 1963, only the Departments of Transportation and National Defense and the Postal Service were active in the town, but by 1977 federal involvement had extended to include such areas as native affairs, the environment, and employment and immigration.

Table 18. Number of government employees, Fort McMurray, 1971 to 1978.

	1971	1972	1973	1974	1975	1976	1977	1978	
Provincial[a]	89	113	113	142	211	262	282	280[b]	(266)[d]
Municipal	52	ND	ND	133	185	245	306	331	(260)[d]
Federal	ND	ND	ND	ND	ND	ND	ND	146[d]	

[a] 1971 to 1974 figures adapted from table in Department of Municipal Affairs (1976).
1975 to 1978 figures from letter, D. McNeil, Alberta Public Service Commission, 15 February 1979.
Alberta Liquor Control Board, Alberta Government Telephones, and Alberta Housing Corporation employees are not included in these totals.

[b] The estimated Keyano College employees have been included to make 1978 figures compatible with earlier years.

[c] 1971 and 1974 figures from Fort McMurray Chamber of Commerce.
1975 to 1979 figures from New Town of Fort McMurray officials. It is unclear whether municipal figures for earlier years relate to full-time equivalent positions, as do later years, or include casual employees on a one-to-one basis.

[d] Source: Department of Municipal Affairs (1978).

2.8.2 Remainder of Study Area

Fort McMurray is the regional centre for government activity in the AOSERP area, but some departments and services also operate in the smaller, predominantly native communities. In Fort Chipewyan, Anzac, and Fort MacKay, government involvement may include native affairs, education, parks, and various social assistance and work programs.

No formal system of local government operates in hamlets in the AOSERP area and all are administered by the Alberta Department of Municipal Affairs, as part of Improvement District 18. The range of municipal services available in the smaller communities is quite limited. Most of the government services to Fort MacKay and Anzac are supplied from the Fort McMurray offices, and the only branches that have had any continued presence are the Alberta Forest Service and the Northlands School Division.

Fort Chipewyan has experienced a growing involvement with government at both provincial and federal levels, as several agencies retain staff and offices in the town. In 1970, the federal government employed slightly more than 20 people in Fort Chipewyan in the Departments of Indian Affairs, Transportation, Health and Welfare, National Parks, Public Works, the Post Office, and the R.C.M.P. The provincial government was represented largely by the Departments of Lands and Forests, and Education which together also employed about 20 persons. More recent employment figures are not available, but it is likely that employment in the public sector has increased. It appears that federal involvement has remained about the same in terms of departments operating out of Fort Chipewyan but some increase in R.C.M.P. staffing is evident and the nursing station operated by Health and Welfare is now better staffed and equipped to provide service. The provincial government presence has also increased to include Preventative Social Services; Recreation, Parks and Wildlife; and Environment.

2.9 GENERAL SUMMARY

Since 1961 the AOSERP study area has undergone a major economic metamorphosis which has been induced, directly or indirectly, almost entirely in response to commercial oil sands development in the area. Most of the economic growth has been concentrated in the Fort McMurray area where the two existing commercial oil sands operations have been located. Development in much of the remaining area, which is sparsely settled--predominantly by native people--has been largely bypassed by the oil sands activity except for some minor impacts associated with experimental operations in the south. The primary industries such as forestry, fishing, and trapping which have traditionally been important to the smaller settlements and the outlying areas have shown no perceptible expansion over the study period and probably have decreased in absolute as well as relative terms. Increased government employment work programs, including employment of native workers at Syncrude during the construction phase, and transfer payments, have to some degree offset the absence of growth in the more traditional sectors.

The Fort McMurray area has witnessed a significant change in the size and structure of its local economy which was first prompted by the GCOS development in the mid-1960s and then, after a five-year pause, by the Syncrude project, which has recently become operational. At the beginning of the study period, Fort McMurray was a relatively dormant community functioning as a service and trading centre for the entire region and as an important rail and river transportation hub connecting to the far north. The magnitude of the oil sands projects which followed would be large in any context but, superimposed as they were on the undeveloped local and regional economy, their impact has been overwhelming. The projects were labour intensive at both the construction and operating phases, and their development had dramatic effects on the economic base of the town. The first major effect occurred in the plant construction phases, which each extended over a period of

four to five years. A massive influx of men, materials, and equipment was required to build the plants and the attendant urban and regional infrastructure. The study area had little excess social infrastructure in place to accommodate the direct and indirect demands of the oil sands developments and, consequently, a considerable amount of construction activity was required incidental to the projects themselves. The construction phase impact for the more recent Syncrude project reached a peak in intensity in 1976 to 1977, approximately two thirds to three quarters of the way to completion. The impact to Fort McMurray during the construction period was to some degree mitigated by the fact that about three quarters of the labour force involved in the oil sands plant construction were domiciled at the project site rather than in the town. Nevertheless, in 1976 the construction industry accounted for more than 35% of local employment.

The pattern has been that project operating and indirect service employment both expand during the project development phase. In the most recent Syncrude development phase, the local service sector grew substantially during the period but still lagged behind the extraordinary growth of the economy generally, and only now, after the main construction activity has abated, does it appear to be catching up to demand. Direct project operating employment began to accelerate and take on significant local dimensions in 1977, and the growth of that sector together with that of the service industry has more than offset the decline in the construction industry. The socio-demographic characteristics associated with the oil sands mining and service industries are also quite different from those of the construction industry; for example, in terms of family sizes, housing requirements and preferences have generally been quite different as between the two industries. To illustrate, from 1977 to 1978 employment in the town increased by a net rate of 14%, but the population grew by 21%. The difference reflects the larger family sizes of the more permanent work force migrating to the town compared to the construction force which was departing.

Synthetic crude oil and, to a lesser extent, the byproduct sulphur account for virtually all the basic industry output of the AOSERP study area. Basic industry activities are considered to be those which provide goods and services to persons outside the region. The annual value of output of the commercial oil sands plants--destined mainly for consumption outside the area--is likely to be in the order of $800 million in the near future. On the other hand, the study area is virtually dependent on the inflow from other areas for almost all the materials, equipment, and supplies it requires. Manufacturing capacity is small, and primary industries make only a modest economic contribution in the area. The service sector, including government administration, has expanded not only in size but also in the range and level of services offered. However, local communities have not yet reached a threshold size and stage of economic maturation sufficient to avoid a substantial leakage of service activities outside the region.

3. POPULATION OF AOSERP STUDY AREA

The AOSERP study area boundaries do not coincide with those of Canada Census enumeration districts so that the population of relevant rural areas can only be estimated. Fortunately, most of the regional population is concentrated in a few communities for which more reliable data are available. Even for communities such as Fort Chipewyan, however, census tabulations have on occasion been inconsistent with those prepared by other sources. For example, the 1976 Canada Census indicated that the population for the hamlet totalled 1179 while other documents have estimated that as many as 1500 persons resided in the community.

The population of the AOSERP area stood at approximately 2600 in 1961, the beginning of our study period. Approximately one half of those people resided in Fort McMurray, with most of the remainder in the unincorporated communities of Fort Chipewyan, Fort MacKay, and Anzac. The population of the region has increased rapidly since 1961 as a consequence of the major oil sands-related resource developments. The current 1978 population of the region is estimated to be somewhat more than 26 000. The annual growth rate in population over the period has been about 15%. Most of the growth has been concentrated in Fort McMurray, which now comprises about 93% of the AOSERP area population. Growth in the region outside of the town has been modest over the period, and the related population now amounts to about 1900.

Table 19 summarizes the population changes in the AOSERP region over the period 1961 to 1978. It should be noted that the population figures do not include personnel engaged in the construction of oil sands plants who resided in camps at project sites. For census purposes, those people are considered to be non-permanent residents. These fluctuating camp populations have nonetheless been significant in the regional context: they reached a peak of about 2300 in 1966 during the GCOS construction phase and 6500 in 1977 during the Syncrude era. The relative impact of the construction camp work force in terms of the regional population has become smaller over time; in the mid-1960s it equated to about one half of the regional population, in the mid-1970s, about 30%.

Table 19. Population of AOSERP study area, 1961 to 1978[a].

	1961	1966	1971	1976	1978
Fort McMurray	1186	2614	6847	15 321	24 580
Unincorporated communities:					
Anzac	154	224	114	138	ND
Fort Chipewyan	717	1026	1122	1 179	ND
Fort MacKay	187	230	200	166	ND
	1058	1480	1436	1 483	1 600[c]
Remainder of area[b]	400	200	300	300	300[c]
TOTAL	2644	4294	8583	17 104	26 480

[a] Sources: Bureau of Statistics (1956 to 1976); Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978); and Dominion Bureau of Statistics. Census of Canada (1961, 1966, 1971, 1976).

[b] For years 1961, 1966, 1971, 1976, estimated from census population figures for relevant enumeration areas.

[c] Estimated.

4. EMPLOYMENT IN THE AOSERP STUDY AREA

4.1 INTRODUCTION

This section of the report deals first with changes in the size and structure of the employment base in the AOSERP study area since 1961; the study area has been divided into three subsets which are discussed separately: Fort McMurray the outlying oil sands project sites, and the remainder of the area. Those discussions are followed by a review of other relevant employment factors.

4.2 FORT McMURRAY

4.2.1 Changes in Local Employment

The local labour force employed in Fort McMurray has grown remarkably since 1961, from a total of 330 persons at that time to almost 10 900 in 1978. That equates to an average growth rate for the period of 23% per annum--much higher than that experienced by the province as a whole. In percentage terms, the annual growth rate in local employment was similar for both the 1961 to 1971 and 1971 to 1978 periods but, in terms of numerical growth, almost 80% of the increase in labour force since 1961 has occurred in the past seven years. Employment has grown at a somewhat faster pace than the population, reflecting changes in average family size and labour force participation rates.

4.2.2 Labour Force Participation

Table 20 compares historical labour force data and participation rates for Fort McMurray and Alberta[1]. The male participation rate in Fort McMurray jumped significantly between 1961 and 1971, but has since then stabilized at a level above the

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[1] Labour force participation is defined as the proportion of the population aged 15 years and older engaged in the labour force.

Table 20. Labour force participation, Fort McMurray and Alberta, 1961 to 1976[a].

	Fort McMurray			Alberta		
	1961	1971	1976	1961	1971	1976
Employed persons:						
Male	267	ND	4,520	352 846	428 975	515 000
Female	63	ND	1,940	125 005	225 010	307 000
Total	330[b]	2 555	6 460	477 851	653 990	822 000
Unemployed persons:						
Total	ND	80	380	13 636	44 615	33 000
Total labour force:						
Male	267	1 915	4 675	363 021	455 080	533 000
Female	63	720	2 145	128 466	243 520	322 000
Total	330	2 635	6 820	491 487	698 600	855 000
Population aged 15 and over:						
Male	371	2 085	5 285	448 820	565 015	645 000
Female	309	1 820	4 570	413 800	548 415	641 000
Total	680	3 895[c]	9 855	862 620	1 113 430	1 286 000
Total population	1 186	6 847	15 321	1 331 944	1 627 874	1 838 000
Labour force particiation rate (%)[d]						
Male	72.0	91.8	88.5	80.9	80.5	82.6
Female	20.4	39.6	46.9	31.0	44.4	50.2
Overall	48.5	67.7	69.2	57.0	62.7	66.6
Employed labour force as percentage of population 15 and over	48.5	65.6	65.6	55.4	58.7	63.9
Employed labour force as percentage of total population	27.8	37.3	42.2	35.9	40.2	44.7

[a] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1971) and Department of Business Development and Tourism. Industry and resources (1975).

[b] Figures given are related to total labour force including both employed and unemployed. Numbers of unemployed are not readily available and are not considered significant; for this analysis total labour force figures are used.

[c] Figures do not add because of rounding of source data.

[d] Labour force as percentage of population 15 and over.

relatively constant provincial average. Fort McMurray's female participation rate more than doubled over the study period and increased at a relatively faster pace than did the provincial rate but by 1976 it still lagged somewhat behind the province (46.9% compared to 50.2%).

The net effect of these changes has been that the overall participation rate in Fort McMurray, which was 8.5 percentage points lower than the Alberta rate in 1961, has increased to the point that it now exceeds the provincial average.

The level of unemployment which prevailed in Fort McMurray in 1961 is unavailable, but it increased from 3.0% in 1971 to 5.6% in 1976. The corresponding rates for the province declined from 6.4% to 3.9% during the same period. The 1976 Fort McMurray level, higher than that of the province, was largely due to the disproportionate amount of female unemployment in the town. The 1976 rates of male unemployment in Fort McMurray and Alberta were quite similar (3.7% and 3.4% respectively) while the respective female rates were 9.6% and 4.7%. The significantly higher female unemployment rate in Fort McMurray was attributable, in part, to a relative lack of jobs in the service sector, which lagged behind general economic growth in the community.

Notwithstanding the fact that participation rates in Fort McMurray are higher than the provincial average, the percentage of the total population employed is somewhat lower for the town (42.4% versus 44.7%). This is due to the large proportion of Fort McMurray's population which is of less than working age. In 1976, 35.7% of the local population was under 15 years of age compared to 30% for the province.

4.2.3 Employment Composition by Industry

Employment composition by industry in Fort McMurray is shown in Table 21 for the period since 1961. Although the annual figures given are not entirely comparable, they do provide an indication of how the structure of the local economy, as measured by employment, has changed over time. The total labour force was small in 1961, and the construction and mining sectors comprised a relatively

Table 21. Labour force by industry classification, Fort McMurray, 1961, 1971, 1975 to 1978[a].

Standard Industrial Classification	1961		1971		1975	1976	1977		1978	
	No.	%	No.	%	No.	No.	No.	%	No.	%
Employed:										
Agriculture, Forestry, Fishing and Trapping	24	7.4	30	1.3	51	9	10	.1	20	.2
Mining	9	2.8	820	35.6	ND	1 675	1 931	22.4	4 004	39.6
Manufacturing	18	5.6	60	2.6	109	49	58	.7	50	.4
Construction	20	6.2	290	12.6	1 370	2 671	3 050	35.4	1 873	18.3
Transportation, Communications and Utilities	120	37.0	160	6.9	ND	ND	417	4.8	442	4.1
Wholesale Trade	34[b]	10.5	20	.9	ND	ND	146	1.7	218	2.1
Retail Trade			215	9.3	327	492	617	7.2	916	7.1
Finance, Insurance and Real Estate	2	.6	70	3.0	ND	ND	458	5.3	528	4.9
Education	ND	ND	190	8.2	259	ND	499	5.8	629	5.6
Health and Welfare	ND	ND	110	4.8	ND	ND	237	2.8	254	2.1
Accommodation and Food Services	68[c]	21.0	120	5.2	ND	ND	315	3.7	408	3.3
Other Community Business and Personal Services			110	4.8	ND	ND	358	4.2	633	5.9
Government	ND	ND	110	4.8	ND	ND	509	5.9	674	6.5
Subtotal	324	100.0	2 305	100.0	5 340	7 597	8 605	100.0	10 649	100.0
Not Answered or Undefined	6		330		ND	ND	953		248	
Total Employed	330		2 635		5 340	7 597	9 558		10 897	
Unemployed	NA[d]		NA[e]		195	465	ND		ND	
Total Labour Force	330		2 635		5 535	8 062	ND		ND	

[a] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1971) and Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1975, 1976, 1977, 1978). (The various census sources used above are not entirely comparable in terms of industry categories used and survey methodologies.)

[b] Combines Wholesale Trade and Retail Trade.

[c] Combines Accommodation and Food Services, and Other Community Business and Personal Services.

[d] Included above.

[e] Included above. Total number of unemployed equalled 80 persons.

minor share of the employment base of the community at that time. More than one third of the labour force was engaged in the transportation and communications industry, and that indicated the importance of Fort McMurray as a rail and waterways transportation hub to the north.

By 1971 the local labour force had grown eight-fold in response to the construction and development of the GCOS plant. The composition of the employment base had also changed significantly: the transportation, communication and utility sector, although increasing modestly in absolute terms, had dropped sharply in relative importance; on the other hand, the mining and construction sectors had increased materially and accounted for almost 36% and 13%, respectively, of the labour force.

In 1973, local employment began to accelerate with the development of the Syncrude project and related social infrastructure. By 1976-1977, at the peak of construction, the construction industry employed about 35% of the labour force domiciled in the town[1]. Most other sectors--with the exception of the primary (agriculture, forestry, fishing, trapping) and manufacturing industries which decreased in both absolute and relative importance--also grew rapidly in the period from 1973 to 1977.

Mid-1978 figures are the most recent available, and a comparison of these figures with the preceding year's tabulations show some dramatic changes in employment patterns[2]. With the construction phase tailing off, employment in the construction industry dropped in absolute terms by about one third. Operational employment in the mining industry more than doubled in the same one-year period and comprised almost 40% of the total labour force in mid-1978. The service sector, while growing rapidly in terms of total persons employed, has maintained a relatively constant or slightly declining share of the total labour force over the past several years.

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[1] This excludes the construction force that resided at the plant site and which will be discussed in a later section of the report.

[2] A more detailed profile of 1978 employment by Standard Industrial Classification is given in Table 22.

Table 22. Detailed breakdown of employment by industry, Fort McMurray, 1978[a].

Industry SIC[b] No.	Classification Name		Number of Persons
10	Agriculture		15
30	Forestry		1
40	Fishing and Trapping		4
50	Mining		3 998
100	Manufacturing		50
	Contractors		
404	General	1 354	
421	Special -- Trade	517	
	Subtotal (SIC 404-421)		1 871
	Transportation, Communications and Other Utilities		
500	Transportation	319	
520	Storage	1	
540	Communication	97	
570	Utilities	25	
	Subtotal (SIC 500-570)		442
	Trade		
600	Wholesale	218	
	Retail		
631	Food Stores	209	
642	General Merchandise	46	
652	Tire, Battery and Accessories	14	
654	Gasoline Service Stations	76	
656	Motor Vehicle Dealers	102	
658	Motor Vehicle Repair Shops	17	
663	Shoe Stores	5	
665	Men's Clothing Stores	4	
667	Women's Clothing Stores	1	
669	Clothing and Drygoods n.e.s.[b]	87	
673	Hardware Stores	76	
676	Household Furniture and Appliances	20	
678	Radio, TV, and Electrical Appliance Repair Shops	17	
681	Drug Stores	54	
691	Book and Stationery Stores	5	
692	Florist Shops	15	
694	Jewellery Stores	1	
695	Watch and Jewellery Repair Shops	9	
696	Liquor, Wine, and Beer Stores	16	
699	Retail Stores n.e.s.[c]	142	
	Subtotal (SIC 600-699)		1 134

continued . . .

Table 22. Continued.

Industry SIC[b] No.	Classification Name		Number of Persons
	Finance, Insurance and Real Estate		
700	Finance	185	
720	Insurance	36	
730	Real Estate	307	
	Subtotal (SIC 700-730)		528
	Community, Business and Personal Service Industries		
	Education and Related Services		
801	Kindergarten and Nurseries	12	
802	Elementary and Secondary	461	
803	Art and Performing Arts	2	
805-806	Post-Secondary Education	147	
807	Libraries, Museums, etc.	7	
820-825	Health and Welfare Services	254	
831	Religious Organizations	22	
	Amusement and Recreation		
841	Motion Picture Theatres	7	
843	Bowling and Billiards	6	
844	Golf and Country Clubs	2	
849	Miscellaneous	10	
	Services to Business Management		
853	Computer Service	1	
855	Security and Investigation	46	
861	Offices of Accountants	24	
862	Advertising Services	1	
864	Engineering and Scientific Services	43	
866	Offices of Lawyers and Notaries	38	
867	Offices of Management and Business Consultants	17	
869	Miscellaneous Services to Business Management	16	
	Personal Services		
872	Barber and Beauty Shops	33	
873	Private Households	6	
874	Laundries, Cleaners and Pressers	18	
876	Self-Service Laundries and Dry Cleaners	1	
877	Funeral Services	1	
879	Miscellaneous	12	

continued . . .

Table 22. Concluded.

Industry SIC[b] No.	Classification Name		Number of Persons
	Accommodation and Food Services		
881	Hotels and Motels	182	
883	Lodging Houses and Residential Clubs	12	
886	Restaurants, Caterers and Taverns	214	
	Miscellaneous		
891	Labour Organizations and Trade Associations	8	
893	Photographic Services n.e.s.[c]	8	
894	Auto and Truck Rental	9	
895	Machinery and Equipment Rental	25	
896	Blacksmithing and Welding	172	
897	Miscellaneous Repair Shops	5	
898	Services to Buildings and Dwellings	52	
899	Miscellaneous	50	
	Subtotal (SIC 801-899)		1 924
	Public Administration and Defence		
900	Federal Administration	146	
931	Provincial Administration	266	
951	Local Administration	260	
	Subtotal (SIC 900-951)		672
999	Industry Unspecified or Undefined		248
	TOTAL		10 887

[a] Source: Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

[b] Standard Industrial Classification.

[c] Not elsewhere specified.

4.2.4 Employment Composition by Occupation

Figures demonstrating the growth and changing pattern of occupational employment in Fort McMurray are given in Table 23. A major shortcoming of the data relates to the fact that only infrequent census surveys have been carried out from which occupational information can be derived and this limits the opportunity to monitor changes over the study period. Furthermore, the information in the table must be interpreted with caution because of changes over time in occupational definitions and survey methodologies. Notwithstanding these qualifications, some relevant observations regarding local occupational patterns can be made. During the decade 1961 to 1971, total employment in the town expanded seven-fold, and employment in each of the occupational categories increased. However, the overall occupational composition showed some change: the relative importance of professional and technical personnel, miners and forestry workers, and clerical and sales staff increased while managerial and administrative, service, and transportation-related employment showed a decline in relative importance.

The structure of occupational employment in 1977 reflects the high level of construction induced by the Syncrude oil sands plant. In that year the construction trades accounted for more than one-third of the employed labour force; that disproportionate share compares to a provincial average of less than 10%.

A comparison of 1977 and 1978 occupational figures shows a marked change as the construction phase tapered off and the operating phase was getting underway. Employment in the construction trades declined from about 3100 to 700 persons in the one-year period. Employment in mining, the physical sciences, materials handling, and assembling, repair, and maintenance all expanded considerably from 1977 to 1978. Employment in sales and service increased, and it appears that the share of the local labour base comprising those fields might now, belatedly, be climbing to more normal levels.

Table 23. Employment by occupation, Fort McMurray, 1961, 1971, 1977, 1978[a].

1961			Occupation Category	1971		1977		1978	
No.	%			No.	%	No.	%	No.	%
33	10.2		Managerial and Administrative	85	4.0	929	10.3	1 200	11.4
23	7.1	Professional and Technical	Natural Sciences, Engineering and Math	120	5.6	970	10.8	1 591	15.0
			Social Sciences	10	.5	48	.5	66	.6
			Religion	5	.2	11	.1	22	.2
			Teaching	135	6.3	372	4.1	445	4.2
			Medicine and Health	80	3.7	138	1.5	214	2.0
			Artistic, Literary and Performing Arts	10[b]	.5	21	.2	43	.4
			Sport and Recreation			13	.1	31	.3
23	7.1		Clerical	320	14.9	1 197	13.3	1 342	12.7
11	3.4		Sales	165	7.7	201	2.2	335	3.2
60	18.6		Services	260	12.1	785	8.7	1 390	13.1
11	3.4		Farming, Fishing, Forestry and Mining	130	6.0	42[c]	.5	792	7.5
100	31.0	Craftsmen, Production, Process and Related Occupations	Processing	115	5.3	53	.6	69	.7
			Machining	90	4.2	190	2.1	341	3.2
			Product Fabricating, Assembling and Repair	135	6.3	505	5.6	1 255	11.9
			Construction Trades	245	11.4	3 082	34.3	709	6.7
51	15.8	Transportation and Communication	Transportation Equipment Handling	100	4.7	330	3.7	425	4.0
11	3.4	Labourers	Material Handling	80	3.7	60	.7	176	1.7
NA	NA		Other Crafts and Equipment Operating	65	3.0	40	.5	122	1.2
323	100.0		TOTAL[d]	2 150	100.0	8 987	99.8[e]	10 568	100.0

[a] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1971) and Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1977, 1978).

[b] Combines Artistic, Literary and Performing Arts, and Sport and Recreation.

[c] The decrease in employment compared to 1971 does not appear to be consistent with other information, particularly in respect to the mining occupation.

[d] Total excludes persons who did not state an occupation or who listed an occupation not classified above.

[e] Due to rounding.

4.2.5 Employment Location and Distribution

In 1961, the employment of Fort McMurray residents outside of the town was limited to the primary industries including forestry, fishing and trapping, and to a minor degree to the mining and transportation industries. In total, only about 10% of the labour force was employed beyond the community boundaries. In the mid-1960s, the GCOS construction phase employed as many as 2300 workers, but most of these were domiciled at the project site and, accordingly, the potential impact on the town's resident labour force was considerably moderated.

With the commencement of preparation for the GCOS operating phase, the number and proportion of the Fort McMurray labour force employed outside the town began to increase. Both GCOS and, more recently, Syncrude have encouraged operations personnel to reside in town rather than at the camp. When operations began in late 1966, GCOS employed about 150 people. That number increased until about 1971 and, if normal maintenance and repair subcontract personnel are included, has averaged about 1500 persons, mostly residents of Fort McMurray. By 1971, approximately one third of the Fort McMurray labour force was employed outside the town.

Table 24 provides figures related to the employment of Fort McMurray residents outside the community since 1974. The figures provided have been estimated from a number of sources and should be considered as order-of-magnitude indications only.

The table shows that the employment of Fort McMurray residents at the Syncrude project reached about 1500 in mid-1976 and 2700 in mid-1977, the peak periods of construction. These figures do not include the 70 to 80% of the total work force directly involved at the Syncrude project but who lived at the project site. The comparable proportion of employees who lived in camp during the GCOS construction phase was apparently much higher.

In 1976 the construction force employed by Canadian Bechtel Ltd., the main contractor, was considerably larger than that of Syncrude Canada Ltd., the operating company. The employment of the

Table 24. Estimated Fort McMurray labour force employed outside town, 1974, 1976 to 1978[a].

Employers	1974	1976	1977	1978
GCOS/Catalytic Enterprises	1655	1302	1246	1470
Syncrude Project				
i) Syncrude Canada Ltd.	24	405	1430[d]	2678
ii) Canadian Bechtel Ltd.	140	1051	1300[e]	400-500[g]
Other	81[b]	60[c]	147[f]	125[h]
TOTAL	1900	2818	4123	4673-4773

a Unless otherwise noted, figures shown were derived from industrial tax transfer data obtained from the Department of Municipal Affairs. Figures are from mid-year.

b Approximation. Tax transfer information indicated 67 employees related to sawmill operations, miscellaneous contractors and suppliers, and Alberta Department of Transportation. A further allowance has been added to account for informal primary employment.

c Estimate.

d Approximate June/July employment from unpublished monthly summary of Mildred Lake manpower.

e Estimates derived by deducting construction camp occupancy from on-site construction force. Figures from unpublished tabulations of construction manpower and camp occupancy.

f Approximation. Tax transfer information indicated 137 employees related to utilities operations, contractors, transportation firms, and oil sands pilot plants. A further provision for primary industry employment has been added.

g Estimates derived by deducting construction camp occupancy from on-site construction force. Figures from unpublished tabulations of construction manpower and camp occupancy.

h Approximation. Tax transfer information indicated 118 employees related to utilities operations, oil sands pilot plants, equipment suppliers, and miscellaneous contractors. A further allowance for primary industry employment has been included.

two firms crossed over in 1977 as construction tapered off and operating employment increased; this changing pattern of employment has continued to the present.

On the basis of the figures in Table 24, employment outside the town reached about 43% of the total in 1978. Most of this is concentrated at the GCOS and Syncrude operations. With the Syncrude project now in its operational stage and the construction force down to modest levels, total employment associated with the two commercial projects is likely to stabilize until further expansion is undertaken.

Of the total labour force working outside Fort McMurray, only about 3% are engaged at oil sands pilot plants, in primary industries and in other capacities unrelated to the GCOS or Syncrude operations.

4.2.6 Labour Force by Part-Time and Full-Time Employment

Information regarding the amount and importance of part-time employment in Fort McMurray is not available for the earlier part of the 1961 to 1978 period, but municipal census data for the years 1975 to 1978 provide some recent information in this regard. In each of the past four years, part-time employment has accounted for 4.0% (1975), 4.8% (1976), 9.9% (1977), and 7.7% (1978) of total community employment and those figures suggest some increase in the availability and importance of part-time positions. This increase is related to the growth in the local service and retail industry, where part-time employment is a more common feature. Industry categories in 1978, in which approximately 20% or more of positions were filled by part-time job-holders, included the retail trade, accommodation and food services, and health and welfare sectors. Those three sectors accounted for roughly 50% of all part-time employment, and the service sector generally accounts for more than 80%. Neither the construction industry--which until recently comprised such a large share of the local employment base--nor the mining industry employs significant numbers of part-time personnel; in 1978, roughly 2% and 1%, respectively, of

the employment in those industries was of a part-time nature. The anticipated growth in the local service sector over the next year or two is likely to further increase the relative importance of part-time employment; this is normally of particular relevance to female participants in the work force.

4.2.7 Employment by Sex

Employment composition by sex in Fort McMurray is summarized in Table 25. The number of women participating in the local labour force has increased substantially in absolute terms, from about 60 in 1961 to almost 3000 in 1978, but perhaps more significant is the proportionate rise in the female share of the total employment base. In 1961, the female share of local employment was 18%, in 1971 it was 26%, and by 1978 it had risen to 29%.

Industry sectors with 50% or more of their local employment comprised of women include services such as health and welfare, personal and accommodation services, education, and finance and insurance. Those sectors, as indicated by Table 25, have been dominated by women since the beginning of the study period, but while finance and insurance, transportation and communications, and the public administration fields continue to increase their proportion of female employees, the recent figures suggest a more equal male-female participation in other services such as health and welfare, education, personal and business services. Since 1961, the increases in female participation seem to have most strongly affected the public administration and trades sectors, in which females presently account for 43% of total employees.

The service industries generally are responsible for 75.9% of female employment in Fort McMurray in 1978. Within the scope of the study period, these industries have always accounted for the largest share of the female labour force (81% in both 1961 and 1971), but the most recent figures indicate that women are participating in a wider spectrum of industry activities.

Table 25. Employment composition by sex, Fort McMurray, 1961, 1971, 1978[a].

Industry Classification	1961			1971			1978		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agriculture	0	0	0	10	5	15			
Forestry	18	0	18	15	0	15	11	7	18[b]
Fishing and Trapping	6	0	6	5	0	5			
Mines and Quarries	8	1	9	765	55	820	3 504	442	3 946
Manufacturing	18	0	18	45	20	65	19	29	48
Construction	20	0	20	280	10	290	1 610	198	1 808
Transportation and Communication	110	10	120	130	20	150	322	98	420
Trades	25	9	34	130	105	235	637	487	1 124
Finance and Insurance	1	1	2	30	40	70	213	311	524
Health, Welfare, Education, Personal Services, Accommodation	31	37	68	195	325	520	1 134	1 143	2 277
Public Administration	29	0	29	95	15	110	378	288	666
TOTAL[c]	266	58	324	1 700	595	2 295	7 279	2 940	10 219

[a] Source: Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978) and Dominion Bureau of Statistics. Census of Canada (1961, 1971).

[b] Combines Agriculture, Forestry, and Fishing and Trapping.

[c] Totals exclude individuals who did not answer or were not elsewhere classified.

The construction and mining industries are still heavily oriented toward male employment; however, from 1971 to 1978 the relative level of female participation in those industries increased from less than 6% to slightly more than 11%.

4.2.8 Labour Force by Age

A comparison between Fort McMurray and Alberta of labour force composition by age is given in Table 26. The figures for Fort McMurray are for the year 1978 while the Alberta figures relate to 1977, but a comparison is valid, as this measure will not change radically over a short period.

The labour force in Fort McMurray is young, with 65.5% of males and 73.1% of females being 34 years of age or less, while for the province only 52.1% and 58.4% respectively are in the 34 years and younger age bracket.

At the far ends of the age span indicated by Table 26, the Fort McMurray percentages are lower than those of the province for both males and females. In Fort McMurray, 90.8% of the male labour force is accounted for by those ranging in age from 20 to 55 years, while the provincial figure for this same group is 76.3%. The female labour force exhibits the same pattern.

4.2.9 Sources of Labour Supply

The Fort McMurray employment base has grown from 330 in 1961 to 2635 in 1971 and to almost 10 900 persons in 1978. That increase equates to an average annual growth rate of about 23% per annum.

The total population of the community has grown at a slightly lower rate of about 20% per annum (participation rates have increased faster than the population during the period). The natural growth rate of Fort McMurray, excluding flows of migrants into and out of the town, amounts to only about 2% to 2.5% per year and, accordingly, net in-migration has supplied most of the additions to the local labour supply. The 1978 municipal survey indicated that less than 2% of the population in Fort McMurray was born in

Table 26. Labour force composition by age, Fort McMurray and Alberta, 1978[a].

	15-19 Years	20-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65 Years and Over	Total
Males:								
Fort McMurray[b]								
Number	422	1 378	3 067	1 588	730	237	23	7 445
% of Total	5.8	18.5	41.2	21.3	9.8	3.2	.3	100.0
Alberta								
Number	64 000	79 000	146 000	106 000	90 000	56 000	12 000	553 000
% of Total	11.6	14.2	26.4	19.2	16.3	10.1	2.2	100.0
Females:								
Fort McMurray[b]								
Number	305	842	1 047	535	207	60	3	2 999
% of Total	10.3	28.0	34.9	17.8	6.9	2.0	.1	100.0
Alberta								
Number	52 000	61 000	84 000	62 000	53 000	25 000	0	337 000
% of Total	15.5	18.1	24.9	18.4	15.7	7.4	0	100.0

[a] Source: Adapted from original tables in Department of Business Development and Tourism. Industry and resources (1978/79) and Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

[b] Figures exclude individuals who did not respond to survey.

the community. The employment pool domiciled at the outlying construction camps is also almost exclusively from outside the region.

Table 27 provides information regarding the previous place of residence of the Fort McMurray population. A comparison between Fort McMurray and Alberta for the year 1971 indicates that at that time no significant difference in previous residence patterns was apparent between the two. Based on the results of a relatively small survey carried out in late 1974 (refer to column two of the table), prior to the major impetus of the Syncrude construction phase, it would not appear that any significant change had occurred by that time. Available data suggest, however, that the structure of former residency was beginning to change by 1975, with a significantly larger share of the local population originating from the province generally. This could reflect the fact that the town was absorbing a considerable number of construction-related and, to a lesser extent, service-sector workers at this time, most of whom could be supplied from the provincial labour pool. In both the early and later stages of the Syncrude construction phase, more than 80% to 90% of the major construction trades were Alberta-based; even during the peak 1977 period, when the demands for skilled workers were straining the provincial labour base, about 73% of the tradesmen employed on the Syncrude project were from Alberta.

More recent figures for the town suggest that, as the Syncrude operational phase approached, the residency structure has changed once again, with a much larger share of new residents being attracted from out-of-province. One indication of this is shown in the final column of the table, which provides residency origins for students of primarily Syncrude employee households. Those figures suggest that more than 80% of these operating employees originate from outside the province. These figures appear to corroborate the reported difficulties that Syncrude has had securing the necessary numbers of skilled workers from the provincial labour pool.

The 1978 municipal census showed also that, of those residents of the town who had previously resided elsewhere, all

Table 27. Previous place of residence, Fort McMurray population, 1971, 1974, 1975, 1978.

Previous Residence	Fort McMurray (% of Residents)				Abasand District (% of Residents)
	1971[a]	December 1974[b]	1975[c]	1978[d]	1978[e]
Alberta	61.8	62.3	78.1	42.3	17.4
Other Provinces of Canada	25.3	31.4	18.0	50.3	68.8
Outside Canada	12.9	6.3	3.9	7.4	13.8
TOTALS	100.0	100.0	100.0	100.0	100.0

[a] Adapted from original tables in Ekistic Design Consultants Limited (1975f). Figures relate to birthplace, not previous residence.

[b] Adapted from original tables in Harries (1975).

[c] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1975).

[d] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

[e] Adapted from original tables in Co-West Associates (1978). Figures relate to previous residence for students enrolled at Abasand Height Elementary School, located in an area predominated by Syncrude employees.

but 7.7% had come from urban centres, with 39% from small communities of less than 20 000 population, 18% from medium-sized centres with populations of 20 000 to 100 000, and the remaining 43% from larger cities exceeding 100 000 population.

4.3 PROJECT CONSTRUCTION SITES

4.3.1 Resident Labour Force

Historical employment information for Fort McMurray and, to a less reliable extent, for the remainder of the rural areas and unincorporated communities in northeastern Alberta is available from periodic census surveys and tabulations. Those surveys generally have excluded population concentrations at construction camps; workers at those camps are considered to be domiciled there only temporarily and are not surveyed. Nonetheless, it is clear that the population and employment at construction camps has been significant to the AOSERP study area periodically since the mid-1960s.

The relative importance of project camps has been particularly felt during the GCOS and Syncrude construction stages, during which a large proportion of the workers were domiciled at the site camps rather than in Fort McMurray or smaller settlements in the area. Almost all the work force involved in the GCOS plant construction and 70% to 80% of those participating directly in the Syncrude development were domiciled close to the project. It also appears that, although not so significant in terms of magnitude, the construction camps continue to house substantial numbers of workers even after the projects have moved into their operating phases. The GCOS camp, for example, offers accommodation to short-term subcontract personnel who provide repair and maintenance services and also to employees requiring temporary quarters while arrangements for more permanent housing are made. Average daily occupancy at the GCOS camp has amounted to about 400 persons over the past several years. It is not unlikely that Syncrude will operate a camp in a similar manner during its operating stage. Other much smaller camps have also operated in the region in association with oil sands pilot projects. These projects supply

camp accommodation if their location is such that access and commuting to Fort McMurray is difficult, if the operating employees reside outside the area and are moved in and out on a periodic job rotation basis, or to domicile workers brought in for short-term periods to provide construction services.

Table 28 provides rough estimates of camp population in the AOSERP study area since the mid-1960s. The figures, for the most part, are not well documented and are shown here to demonstrate a sense of the relative importance of camp population and employment.

Peak periods for camp occupancy occurred in 1966 and 1977. To provide an indication of the relative importance of those camp population figures, it is estimated that in 1966 the average camp force probably exceeded the labour force within the town by 50% or more, and amounted to at least one half Fort McMurray's population at the time. In 1977, while the importance of the Syncrude camp relative to the town was not as consequential as in 1966, it was nonetheless significant: in that year the camp force was equivalent to about two thirds of the town's total labour force and about 30% of its population.

4.3.2 Project Labour Force Requirements

The pattern for the GCOS and Syncrude developments has been that a large share of the labour force involved in the construction of those projects has been domiciled at the plant site while operating employees have been expected to reside in the urban centre of Fort McMurray. The experience of the two projects was similar in that the labour force estimates of both the construction and operating phases were seriously underestimated; the projects turned out to be much more labour intensive than anticipated. For example, the 1966 GCOS annual report estimated that an ultimate labour force of about 700 would be required to operate the plant; the final number was more than double that estimate. Similarly, a 1973 report prepared for Syncrude estimated that 1108 operating employees would be required (Reid, Crowther and Partners Limited 1973); an early 1974 report estimated a figure of 1677 (Canadian

Table 28. Estimated construction camp population in the AOSERP study area, 1965 to 1978.

Employers	1965-67	1968-74	1975	1976	1977	1978
GCOS						
Construction	600-2300[a]	NA	NA	NA	NA	NA
Operation[b]	NA	400	400	400	400	400
Syncrude						
Construction	NA	NA	2800[c]	4800[d]	5800[e]	2100[f]
Other[g]	ND	ND	10-20	10-20	30	30
	2300	400	3200	5200	6200	2500

[a] Peak camp force estimate derived from Great Canadian Oil Sands Ltd. Annual Report (1966) and Department of Advanced Education and Manpower (1976). Low figures estimated at 25% of peak.

[b] Source: Verbal communication with J. Gilliand, Great Canadian Oil Sands Ltd. 9 January 1979. Figure given is approximate average for past several years but may range as high as 700 persons for short periods of time.

[c] Ratio of camp occupancy to total Mildred Lake manpower force in 1976 has been applied to 1975 manpower figures.

[d] Source: Letter from official, Government of Alberta. Department of Municipal Affairs. Planning Division. Research and Development Branch. 9 January 1979. 1976 range = 2612 to 5983.

[e] Source: Letter from official, Government of Alberta. Department of Municipal Affairs. Planning Division. Research and Development Branch. 9 January 1979. 1977 range = 4093 to 6519.

[f] Estimate based on figures for start of period, mid-year, and end of year provided by Syncrude Canada Ltd. 10 January 1979. Range = 1300 to 4000 for the year.

[g] Excludes short-term construction manpower at pilot plants. Figures given relate to Amoco pilot operation.

Bechtel Limited 1974); and early 1975 documents used estimates of 1800 to 2000 employees (Harries 1975 and Syncrude Canada Ltd. 1975). In fact, by mid-1978 the local employment was already greater than 2500 and has reached 3000 persons at full operation. The operating labour force of an oil sands plant comprises construction-related occupations (about one half the total), process operators (about one quarter), and administrative, technical, and professional personnel (one quarter).

The labour force necessary to construct an oil sands plant has been much greater than expected. The reports cited earlier in this section estimated that the Syncrude project construction force would peak at 1839 workers (1973 report estimate), 3000 workers (January 1974 estimate), and 4400 to 5137 workers (January and February 1975 estimates). Actually, the peak labour force, reached in mid-1977 (and excluding Syncrude Canada Limited personnel) totalled almost 7900. The construction labour force is oriented toward the demand for skilled operating engineers and construction tradesmen, with pipefitters, electricians, carpenters, pipefitter-welders, and ironworkers of particular prominence. The absolute requirements for unskilled or semi-skilled labourers, while large, comprise only about 15% of the total manual workers on the project.

4.4 REMAINDER OF THE STUDY AREA

4.4.1 General Observations

Considerable care has to be taken in interpreting demographic data collected from rural, isolated, sparsely populated, and largely native areas such as those in northeastern Alberta which lie outside of Fort McMurray. Survey data, which are collected only infrequently and which often incorporate changing definitions and methodologies, suffer from the normal problems inherent in collecting information from such areas. These include the small and unreliable survey size, and the need to ensure

that the surveyed population--which has proportionately greater language and educational deficiencies--communicates reliable information.

4.4.2 Labour Force Participation

Labour force participation levels in I.D. 143, a geographic area somewhat larger than the AOSERP study area, are given in Table 29 for the years 1961, 1971, and 1976. The participation rates from 1961 to 1971 show an overall decrease, which cannot be explained. The figures for those two benchmark years suggest that the female participation rate climbed sharply but was more than offset by a decline in male participation levels. A comparison of 1961 with 1976 figures shows a marginal increase in labour force participation rate from 51.5% to 53.6% over the 15 years, compared to corresponding provincial average figures of 57.0% and 66.6%. During the 15-year period covered in the table, the female participation rate increased by a factor of three while the male rate dropped slightly.

Labour force participation rates can, by themselves, be misleading; they may seriously overstate the real level of employment activity. A proportion of the working-age population can participate in the labour force but be unemployed and have little likelihood of securing a job. This has been the situation in I.D. 143, where the unemployment rate exceeded 21% in 1976, compared to less than 4% for Alberta generally.

Employed labour force as a percentage of the working-age population is a more relevant indication of employment activity; on this basis the comparison between I.D. 143 and the province becomes more meaningful: the respective rates were 41.8% and 63.9% in 1976. Even that indicator may understate the real difference in relative regional and provincial employment levels. Employed labour figures for I.D. 143 likely include a high proportion of part-time, seasonal, and low-paying positions.

Table 29 also shows the proportion of employed labour force to total population; in 1976, 24% of the population in I.D. 143

Table 29. Labour force participation in I.D. 143, 1961, 1971, 1976[a].

	Improvement District 143[b]		
	1961	1971	1976
Employed			
Male	ND	350	325
Female	ND	100	140
Total	ND	450	460[c]
Unemployed			
Total	ND	20	125
Labour Force			
Male	472	365	420
Female	40	105	165
Total	512	470	590[c]
Population 15 and over			
Male	625	625	600
Female	370	465	505
Total	995	1085[c]	1100[c]
Total Population	1650	1860	1920
Labour Force Participation Rate (%)[d]			
Male	75.5	58.4	70.0
Female	10.8	22.6	32.7
Overall	51.5	43.3	53.6
Employed Labour Force as % of Population 15 and over	ND	41.5	41.8
Employed Labour Force as % of Total Population	ND	24.2	24.0

a Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1971, 1976).

b Area excludes Fort McMurray.

c Figures do not add due to rounding of source data.

d Labour force as % of population 15 and over.

was employed, contrasted with 44.7% in the province. The differential between the region and the province is accentuated by the relatively larger family sizes in northeastern Alberta. It should be noted that the differential in employment rates between Alberta and I.D. 143 appears to be growing: from 1971 to 1976, employed labour force as a percentage of total population increased in Alberta from 40.2% to 44.7%, while during the same period the rate in I.D. 143 declined marginally from 24.2% to 24.0%. The rates of employment in the outlying areas and smaller communities of the AOSERP study area are also substantially below those in Fort McMurray, which are comparable to provincial levels.

4.4.3 Labour Force by Industry

Table 30 provides labour force statistics by industry and sex for I.D. 143. Comparisons between the 1961 and 1971 figures are made difficult by the large number of "industry not specified" responses in 1971. However, some observations in respect to the table are given in the following paragraphs.

The number of persons involved in the labour force did not change significantly during the decade and, in fact, the table provides some evidence of a possible decline. The sharp fall in the number of persons employed in public administration over the 10-year period does not appear to be reasonable and probably reflects some error or definitional changes.

The relative number of women in the labour force increased sharply with most new employment generated by community business and the personal service sector. In 1961 females comprised only 8% of the labour force in the Improvement District; by 1971 this had increased to 20%

A large share of the labour force participated in the primary industries, particularly forestry, fishing, and trapping. Those sectors, and manufacturing, which is undoubtedly also associated with primary resource activities, accounted for more than 40% of the total labour base in 1961 and more than one quarter in 1971. The number of people engaged in fishing or trapping, which

Table 30. Labour force by industry and sex, Improvement District 143, 1961, 1971[a].

Industry Category	1961			1971		
	Male	Female	Total	Male	Female	Total
Agriculture	0	0	0	5	0	5
Forestry	21	2	23	60	0	60
Fishing and Trapping	126	0	126	5	0	5
Mines, Quarries and Oil Wells	6	1	7	10	0	10
Manufacturing	71	3	74	35	0	35
Construction	1	0	1	40	0	40
Transport, Communication and Utilities	50	0	50	40	0	40
Trade	13	8	21	15	15	30
Finance, Insurance and Real Estate	0	0	0	0	0	0
Community Business and Personal Services	61	25	86	60	55	115
Public Administration	114	1	115	40	5	45
Not Specified	9	0	9	60	20	80
Total	472	40	512	370	95	465

[a] Source: Dominion Bureau of Statistics. Census of Canada (1961, 1971).

were the most important of the primary industries in 1961, had dropped significantly by 1971, but this finding may be distorted by the large number of unspecified responses. Fishing and trapping are informal and seasonal industries, and that perception may have affected the 1971 survey responses and tabulations.

4.4.4 Local Community Employment

The three most important settlements in the AOSERP study area, outside of Fort McMurray, are Fort Chipewyan, Fort MacKay, and Anzac. These communities, which are growing, are predominantly native and characterized by high rates of unemployment and underemployment. Transfer payments under various social assistance programs provide important income supplements. Each of the communities is discussed briefly below.

4.4.4.1 Fort Chipewyan. This community, with a population estimated to be 1200 to 1500, is quite isolated from the major oil sands development area farther to the south, because of distance and lack of all-weather road access. Economic development in the immediate area of Fort Chipewyan has been limited and local job opportunities generally revolve around temporary and seasonal activities such as fishing (spring), trapping (winter), and firefighting and parks employment (summer). A few residents of the settlement leave to seek short-term employment in places such as Fort McMurray, but there has been a general reluctance on the part of inhabitants to permanently relocate elsewhere. A number of native persons are also engaged in the community service sector, but the population of non-natives--comprising about 5% of the total--has increased in response to the growing involvement of government and accounts for the more senior or highly skilled positions in that sector.

The traditional forms of livelihood, including fishing, trapping, and forestry, have fluctuated substantially in importance over the years for a variety of reasons, but the available evidence suggests a decrease in relative, if not absolute importance, of

those industries over the past decade or so. No significant employment opportunities have been generated locally in other sectors to offset that tendency.

4.4.4.2 Fort MacKay. Fort MacKay is located closer to the oil sands development area and to Fort McMurray and therefore has greater accessibility to both. With the exception of elderly local residents, most members of the adult labour force have had experience with wage employment (Van Dyke 1978). A substantial proportion of local residents has been employed on an occasional basis as labourers, forestry workers, firefighters and, to a more limited degree, as equipment operators. Nonetheless, the community is characterized by a high level of seasonal- and under-employment and trapping and firefighting constitute the major types of activities for those employed.

4.4.4.3 Anzac. Employment patterns in Anzac are reasonably similar to those in the other settlements discussed, with high levels of unemployment and seasonal employment prevailing. A survey carried out in the community showed that three quarters of the residents with employment experience had worked in or around Anzac. Positions were held at the Amoco pilot plant or as parks employees, some were self-employed in their own businesses, and others worked occasionally as labourers and trappers. The majority of those working outside the immediate area of the community were employed at GCOS, Syncrude, or in Fort McMurray.

4.5 OTHER EMPLOYMENT FACTORS

4.5.1 Job Vacancies and Recruitment

Job vacancy information for the entire study period is not available, and the relevant federal agency involved--Canada Manpower--does not distinguish employment and job vacancy data as between Fort McMurray and the other communities in the territory such as Fort Chipewyan, Fort MacKay, and Anzac.

The construction phases for both the GCOS and Syncrude plants called for a massive influx of skilled and unskilled labour into the study area. The majority of those workers were recruited within Alberta (77% in 1976 and an estimated 70% in 1977 in the case of Canadian Bechtel, the Syncrude construction contractor) with most of the balance coming from other Canadian provinces. The construction trades which required the most out-of-province recruitment included pipefitters, ironworkers, and electricians. In 1977, 4% of those working in the Syncrude construction phase were from other countries, primarily the U.S.A. and United Kingdom (Canadian Bechtel Ltd. and Syncrude Canada Ltd. Unpublished).

The Fort McMurray Canada Manpower office was inundated with enquiries from skilled and unskilled transient workers in 1976-1977, but the enquiries and registrations had decreased by 50% in 1977-1978. The Fort McMurray office of Native Outreach, a job placement and counselling service which focusses on native employment, acted as a local referral agency for the Construction and General Workers Union, while the other unions used their hiring halls in Edmonton for Fort McMurray job orders.

Training programs (apprenticeship, pre-employment, vocational, and construction site labour upgrading) increased the manpower availability and eased the shortages faced by Canadian Bechtel over the Syncrude construction period. Bechtel itself operated programs in both Edmonton and at the Mildred Lake site. Keyano College in Fort McMurray produced pre-employment and apprenticeship candidates and, in addition, from 1974 to 1978, graduated 640 students from their five-week industrial worker program.

Problems faced in satisfying manpower demands during the Syncrude construction phase were exacerbated by an extremely high labour turnover rate. For example, Syncrude experienced a turnover rate of approximately 34% in 1977 (Co-West Associates 1978), and the GCOS rate for 1978 was about 30% (verbal communication with GCOS officials, 13 February 1979). The turnover rate experienced by the Fort McMurray municipality was in the order of 80% in 1976; that rate, according to the town's annual reports,

has fallen since then to about 60% in 1977 and 30% in 1978 (verbal communication with Town of Fort McMurray officials, 21 February 1979). Much of the turnover has been attributed to the movement of employees into and out of the community rather than between local employers. High rates of turnover have been a fact of life for most small businesses in Fort McMurray over the past few years.

As the Syncrude permanent work force built up in preparation for the August 1978 plant start-up, and as the plant construction force phased out, the Fort McMurray area began to experience a better balance between labour supply and demand, and turnover problems have been declining. The proportionate increase in family households associated with the Syncrude operational stage has provided a considerable increase in the number of female entrants to the local labour supply, which has eased the labour supply situation in the Town service sector; the service sector had incurred rapid expansion during and subsequent to the Syncrude construction period. The number of women registering for work has increased dramatically since early 1978.

Table 31 provides some indication of changing job opportunities in Fort McMurray since 1976. The average number of job vacancies rose modestly from 1976 to 1977, but there was a perceptible decrease from 1977 to 1978. Vacancies in the forestry, agriculture, and manufacturing industries remained insignificant during the period. The small but increasing share of vacancies exhibited in the mining category does not reflect the extent of Syncrude's recruitment for its plant operations: the firm's Edmonton office handled such recruitment and, in addition, neither GCOS nor Syncrude attempts to compete with each other locally for the same labour. The vacancies in the general contracting industry peaked in 1976, while vacancies in the special contracting industry peaked in 1977 and declined at a slower rate; the latter may be explained by the fact that special contractors are normally more heavily involved in the later finishing stages of construction. Wholesale and retail trade shows a somewhat increasing share in local job opportunities, but the most significant change occurred

Table 31. Average number of job opportunities available through Canada Employment Centre, Fort McMurray, 1976 to 1978[a].

Industrial Classification	1976		1977		1978	
	Av. No. of Jobs Vacant	% of Total	Av. No. of Jobs Vacant	% of Total	Av. No. of Jobs Vacant	% of Total
Forestry, Farming and Agriculture	1	0	1	0	1	0
Mining	9	3	19	5	11	5
Manufacturing	7	2	9	3	4	2
General Contracting	85	26	20	6	11	5
Specialized Contracting	85	26	122	34	56	26
Transportation, Communication and Utilities	19	6	15	4	11	5
Trade	31	9	39	11	25	12
Finance, Insurance, Real Estate, Community Business and Personal Services	79	23	123	34	84	40
Public Administration	16	5	12	3	11	5
TOTAL	332	100	360	100	214	100

[a] Source: Letter from R. McTavish, Fort McMurray Canada Employment Centre, 9 January 1979.

in the service sector, including community business, personal services, finance, insurance and real estate. Vacancies in public administration remained relatively constant.

With the latest oil sands plant coming on stream late in 1978, both GCOS and Syncrude share long-term concerns regarding labour supply. Each uses aggressive recruitment programs, especially in the other Canadian provinces outside of Alberta, but including overseas areas as well. In-house training programs are being expanded, and the firms are increasing their involvement with training institutions such as Keyano College to assist in providing an adequate supply of trained labour.

4.5.2 Native Employment

The historical participation of native persons in the development and operation of oil sands projects in the AOSERP study area is not well documented and cannot readily be traced over the study period.

One source (Garvin and Robertson unpublished manuscript), indicated that about 26% of the GCOS construction work force were native people. That would suggest that as many as 600 natives may have been involved at the peak level of construction. During the Syncrude construction phase, native labour participation averaged about 10%, and reached a peak in 1976 of 600 to 700 persons.

The experience has been that native employment in the operations phases is considerably lower. In 1974, an average of 85 natives representing about 7% of the work force were employed by GCOS. The number of native employees jumped to 125 in 1975 and has since remained more or less constant in the range of 125 to 140, representing somewhat less than 10% of the GCOS work force. The turnover rate among native employees at GCOS has not differed appreciably from that of non-native employees; between 1971 and 1977 the average stay of native employees was slightly in excess of one year and, if those leaving GCOS employ within three months (accounting for about 36%) are excluded, the average period of employment

was more than two years (verbal communication with GCOS official, 13 February 1979).

In early 1979, during the first year of Syncrude operations, native employment was about 150, or approximately 5% of total operational employees (verbal communication with Syncrude official, 14 February 1979). There appears to be a concentration of native personnel in the field of heavy equipment operation, with the remainder spread equally in other occupations such as millwrights and welders.

In 1976 Syncrude signed an agreement concerning native development with the Indian Association of Alberta and the Canada Department of Indian Affairs and Northern Development. Although that agreement addressed only the employment of Treaty Indians, Syncrude includes non-status Indians and Metis in its native employment program. Despite Syncrude's recruitment efforts in the communities of the AOSERP study area, the company (as well as GCOS) appears to experience more favourable response from applicants from outside the region, such as the Cold Lake, St. Paul, and Lac La Biche areas. Small numbers of natives from other provinces and the Northwest Territories are also employed.

On-the-job training programs as well as counselling services have been made available by GCOS and Syncrude to assist efforts in recruiting and retaining native employees. Keyano College graduated 640 people from its five-week industrial worker courses over the period 1974 to 1978; natives accounted initially for 95% of graduates, but that proportion had decreased to 75% by 1978.

In addition to that part directly concerned with native employment, the 1976 agreement among Syncrude, the Department of Indian Affairs and Northern Development, and the Indian Association of Alberta also established the Indian Oil Sands Economic Development Corporation to further encourage native participation in the economic development of the region. Syncrude works with potential native contractors to enhance their ability to compete for company contracts. Equity capital grants are made available from a foundation established in connection with the corporation. Several

small contracts have been awarded to native companies for landscaping, tree planting, and undertaking a socio-economic study in Fort McMurray; as well, a five-year drycleaning contract has been awarded to the Goodfish Lake Indian Band.

4.5.3 Union, Trade, and Professional Conditions of Hiring

The employees of GCOS formed an association prior to 1971, which later became the McMurray Independent Oil Workers Union (MIOW), and although the company handles all hiring and recruitment, joining the MIOW is a condition of hiring. In early 1979 there were over 800 members. The employees of Catalytic Enterprises Ltd., which provides maintenance and repair services to GCOS, are not included in that union.

Canadian Bechtel, the Syncrude general contractor, negotiated agreements with the 17 building trades unions which were involved in plant construction; those agreements covered the period through the construction phase. As of early 1979, Syncrude operating employees had not yet unionized, although representations and organizing efforts by various unions were under way at that time.

In some instances the unions have been involved in upgrading trade qualifications. The Construction and General Workers Union worked with Keyano College and Canadian Bechtel to develop the five-week industrial worker courses previously mentioned; the contractor agreed to hire successful graduates. The same union also sponsored three-week industrial worker upgrading programs to qualify operating employees for more responsible positions.

Local employment in the public sector has been characterized by a high level of union involvement; for example, Fort McMurray hospital workers and municipal employees, school board non-teaching staff, and Keyano College personnel are all organized under the Canadian Union of Public Employees.

4.5.4 Conditions of Employment

The Syncrude construction phase, which fully commenced in 1975, was governed by conditions of employment agreed to by Canadian Bechtel and the various building trades unions. Whether union or non-union, other contractors engaged in construction projects in the Fort McMurray area during this period also observed terms of employment generally comparable to those agreed to by Canadian Bechtel.

Wages for each trade were pegged at the rates prevailing elsewhere in the province north of Red Deer. But the inducements offered to building tradespeople to seek employment in Fort McMurray included free room and board at the Mildred Lake site or a subsistence allowance of $35 per day, as well as guaranteed overtime. The work week was set at 48 hours and the difference between each trade's regular work week (ranging from electricians with a 35-hour week, plumbers and pipefitters with a 37.5-hour week, and ironworkers with a 40-hour week) and 48 hours per week represented hours of overtime. Union wage rates paid for overtime were double normal rates, although this ranged down to one and one-half for some non-union employees. On the basis of overtime income, construction workers in Fort McMurray earned approximately one third to one half more than their counterparts in the same trade in, say, Edmonton, who had no overtime. The unions and Bechtel agreed to no strikes and no lockouts for the duration of the contracts.

Wage rates for GCOS operating employees, all members of the McMurray Independent Oil Workers Union, and other local employees rose substantially at the beginning of the Syncrude plant construction phase; notwithstanding this, many employers experienced work force attrition in favour of Bechtel construction employment.

With Syncrude production coming on stream in late 1978, the level of Canadian Bechtel employment has declined. By January 1979, hours of overtime for the remaining construction work force were reduced to the difference between each trade's regular work week and a 40-hour week; that is, zero to a maximum of 5 hours per week, according to the trade.

Both the GCOS and Syncrude plants utilize open-pit mining coupled with a hot water extraction procedure, and 24-hour operations are necessary for efficient production. For all but office employees, GCOS uses a 28-day work cycle based on 7 days on with 2 days off, followed by 7 days on with 1 day off, and 7 days on with 4 days off. The basic work week totals 42 hours, of which 2 hours represent overtime. Syncrude, on the other hand, is largely operating on a 3-day week with 12-hour shifts. In early 1979 the company was waiting for approval to transfer the remaining non-office employees--mine maintenance and mine operations--to the 3 days per week shift arrangement.

The extent to which shift work is a feature of life in Fort McMurray is demonstrated by the fact that slightly more than one third of local respondents to a survey conducted in the spring of 1978 were engaged in employment requiring shift work. The actual proportion among principal wage earners is probably even higher, as spouses and other household members were included in the number responding (2266).

The wage rates for operating positions at both Syncrude and GCOS are apparently somewhat higher than those for comparable work in other parts of the province. Incomes are also supplemented by some overtime allowances, but those allowances are modest compared with the overtime allowed construction workers during the Syncrude construction phase.

Because the availability of adequate and affordable housing was an important factor in attracting and retaining a permanent work force, both GCOS and Syncrude provide comprehensive employee housing programs. GCOS provided mobile homes until permanent accommodation could be constructed, while Syncrude, through its housing arm, Northward Developments Ltd., embarked on the construction of single family dwellings, patio houses, and apartments concurrently with the construction of the plant itself. Rents are subsidized, employees receive a subsidy intended to equalize utility costs with those in Edmonton, and both companies offer types of lease-purchase arrangements and mortgage subsidy programs for single family dwellings.

5. HOUSING IN THE AOSERP STUDY AREA

5.1 INTRODUCTION

This part of the report reviews changes in the size and structure of the housing market in the AOSERP study area; major attention is addressed to Fort McMurray where much of the regional development has been concentrated over the past decade.

5.2 HOUSING IN FORT McMURRAY

5.2.1 Overall Building Activity

Historical building permits data relating to Fort McMurray are given in Table 32. Over the period shown, 1964 to 1977, residential construction comprised an estimated two thirds of the total value of building construction in the town; institutional and government, and commercial building activity accounted for most of the remaining volume. The boom periods coinciding with the GCOS and Syncrude construction and operational build-up phases (1966 to 1968 and 1974 to 1977) are marked by high levels of residential construction. Data covering the most recent one-year period shown, 1977, indicate that residential activity was beginning to decline while commercial and institutional volumes were rising in both absolute and relative terms. That information might suggest that the provision of local services in the town lagged behind population and residential growth.

5.2.2 Residential Building Activity

The number and composition of residential building permits issued in Fort McMurray over the period 1964 to 1977 is shown in Table 33. The table excludes, of course, mobile housing for which permits are not issued but which constitutes a significant share of the local housing market. Over the past decade, annual activity (as measured by permits) has ranged from a bottom level of only 13 units in 1969 to a peak in 1976 of more than 1600 housing units. The relative volume of annual residential construction during the Syncrude construction phase exceeded that

Table 32. Estimated value of construction based on building permits issued, Fort McMurray, 1964 to 1977[a].

Year[b]	Residential ($'000)	% of Total	Commercial ($'000)	% of Total	Industrial ($'000)	% of Total	Institutional and Government ($'000)	% of Total	Total ($'000)	% of Total
1964	666	32.8	1 158	57.0	68	3.3	141	6.9	2 033	100.0
1965	461	19.6	332	13.9	0	0.0	1 565	66.5	2 385	100.0
1966	2 258	93.9	109	4.5	38	1.6	0	0.0	2 405	100.0
1967	4 692	82.3	251	4.4	15	0.3	740	13.0	5 698	100.0
1968	2 103	64.6	641	19.7	22	0.7	490	15.0	3 256	100.0
1969	271	27.0	41	4.1	0	0	690	68.9	1 002	100.0
1970	1 551	83.1	28	1.4	46	2.5	242	13.0	1 867	100.0
1971	2 278	78.1	404	13.8	21	0.7	216	7.4	2 919	100.0
1972	6 895	57.3	3 071	25.5	631	5.2	1 446	12.0	12 043	100.0
1973	3 979	72.7	1 124	20.5	8	0.1	365	6.7	5 476	100.0
1974	29 082	70.5	5 099	12.4	1 086	2.6	5 986	14.5	41 253	100.0
1975	25 452	58.7	4 820	11.2	185	0.4	12 868	29.7	43 325	100.0
1976	70 109	79.9	11 892	13.5	3 630	4.1	2 155	2.5	87 786	100.0
1977	25 586	51.3	16 688	33.5	974	2.0	6 578	13.2	49 826	100.0
Average 1964-1977		67.1		17.5		2.6		12.8		100.0

[a] Adapted from original tables in Dominion Bureau of Statistics. Building permits: annual summary (1964-1977).

[b] Figures for Fort McMurray are unavailable for 1961-1963.

Table 33. Residential building permits issued by type, Fort McMurray, 1964 to 1977[a].

Year	Single Dwelling	% of Total	Double Dwelling	% of Total	Row Housing	% of Total	Apartment	% of Total	Other	% of Total	Total[b]	% of Total
1964	17	24.3	0	0.0	0	0.0	53	75.7	0	0.0	70	100.0
1965	34	100.0	0	0.0	0	0.0	0	0.0	0	0.0	34	100.0
1966	103	55.6	42	23.1	0	0.0	36	19.8	1	0.5	182	100.0
1967	234	63.9	80	21.9	0	0.0	52	14.2	0	0.0	366	100.0
1968	145	97.3	4	2.7	0	0.0	0	0.0	0	0.0	149	100.0
1969	13	100.0	0	0.0	0	0.0	0	0.0	0	0.0	13	100.0
1970	66	52.8	0	0.0	0	0.0	59	47.2	0	0.0	125	100.0
1971	102	68.9	1	0.7	0	0.0	45	30.4	0	0.0	148	100.0
1972	137	55.5	32	13.0	0	0.0	77	31.2	1	0.4	247	100.0
1973	86	31.7	4	1.5	0	0.0	181	66.8	0	0.0	271	100.0
1974	527	40.5	88	6.7	7	0.5	678	52.1	2	0.2	1302	100.0
1975	317	45.9	80	11.6	0	0.0	293	42.5	0	0.0	690	100.0
1976	302	18.8	14	0.9	579	36.0	713	44.3	0	0.0	1608	100.0
1977	102	8.8	24	2.1	318	27.6	709	61.5	0	0.0	1153	100.0
Total Permits 1964-1977												
	2185	34.4	369	5.8	904	14.2	2896	45.5	4	0.1	6358	100.0

[a] Adapted from original tables in Dominion Bureau of Statistics. Building permits: annual summary (1964-1977).

[b] Excludes mobile dwelling units.

of the GCOS phase by a factor of about five times. The composition of residential construction by type of dwelling has also changed considerably over the period illustrated in the table. During the peak period marked by the GCOS development, single detached dwelling permits comprised more than two thirds of the total, with the remainder divided between duplexes and apartments (18% and 13% respectively). By comparison, during the 1974 to 1977 Syncrude period, single detached units accounted for only 26% of all permits, duplexes 4%, row housing 19%, and apartments 51%. The trend in local housing has clearly been toward higher density residential living.

5.2.3 Size and Composition of Housing Stock

The size and composition of the Fort McMurray housing stock has been traced over the study period in Table 34. The annual figures in the table have been derived from a number of sources and are not entirely consistent with one another, but generally they can be used to demonstrate the chronology of housing development in the town. The size of the local housing stock has grown remarkably since 1961, when there were only 300 dwelling units, to more than 8500 units by 1978. During the first decade, 1961 to 1971, the housing stock increased by about 1300 units; over the past seven years the number has grown by a further 6900 units.

The composition of the housing mix has also changed radically, from a predominantly single detached configuration in 1961, to the present time, whereby single detached, duplex and row housing, apartments, and mobile dwellings each comprise from 20% to 30% of the housing mix. The share of total housing accounted for by single dwellings has fallen continuously over the study period; mobile units, which first appeared in the mid-1960s and which peaked at 30% of the housing stock in 1976, have since declined to a 20% share. Apartment units have continued to take a larger share of the market and now comprise 29% of the total. Row housing or townhouse units were first developed in the mid-1970s

Table 34. Composition of housing stock, Fort McMurray, 1961 to 1978.

Year	Single Dwelling	%	Double Dwelling	%	Row Housing	%	Apartment	%	Mobile	%	Total	%
1961[a]	276	91.7	25	8.3	0	0.0	0	0.0	0	0.0	301	100.0
1966[b]	373	61.1	54	8.9	0	0.0	41	6.7	142	23.3	610	100.00
1971[c]	1 015	62.7	110	6.8	30	1.8	175	10.8	290	17.9	1 620	100.0
1972[d]	1 030	50.2	151	7.4	0	0.0	281	13.7	590	28.8	2 052	100.0
1974[e]	1 265	48.0	190	7.2	0	0.0	483	18.4	696	26.4	2 634	100.0
1975[f]	1 574	39.4	300	7.5	38	1.0	776	19.4	1 312	32.7	4 000	100.0
1976												
Summer[g]	1 565	37.3	370	8.8	100	2.4	865	20.6	1 295	30.9	4 195	100.0
Fall[h]	1 929	36.4	339	6.4	231	4.4	1 206	22.8	1 585	30.0	5 290	100.0
1977												
Summer[i]	2 068	34.9	375	6.3	623	10.5	1 134	19.2	1 720	29.1	5 920	100.0
Fall[j]	2 176	28.5	790	10.4	1 031	13.5	1 793	23.5	1 837	24.1	7 627	100.0
1978												
Summer[k]	2 275	28.4	707	8.8	1 280	16.0	1 831	22.9	1 912	23.9	8 005	100.0
Fall[l]	2 268	26.6	765	9.0	1 229	14.4	2 486	29.1	1 781	20.9	8 529	100.0

[a] Adapted from original table in Dominion Bureau of Statistics. Census of Canada (1961).

[b] Adapted from original table in Dominion Bureau of Statistics. Census of Canada (1966).

[c] Adapted from original table in Dominion Bureau of Statistics. Census of Canada (1971).

[d] Adapted from original table in Reid, Crowther and Partners Ltd. (1973).

[e] Source: Single dwellings, apartments, and mobile estimates based on figures in Cohos, Evamy and Partners (1974) and double dwellings from Dominion Bureau of Statistics. Census of Canada (1971) plus estimates from number of building permits.

[f] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1975). Excludes "Other" category.

[g] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1976). Figures relate to occupied dwellings, not total housing stock.

[h] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1976). Excludes "Other" category.

[i] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1977).

[j] Adapted from original tables in New Town of Fort McMurray. Quarterly report: housing and population count (1977).

[k] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

[l] Adapted from original tables in New Town of Fort McMurray. Quarterly report: housing and population count (1978).

and now account for about 15% of local housing. An historical comparison of the housing composition in Fort McMurray and Edmonton is shown in Table 35. In 1961, the town's housing mix differed from that of the city by the absence of apartments: the town's entire housing stock consisted of single and semi-detached units. By 1966 the Fort McMurray and Edmonton housing mixes were similar except in respect to apartments and mobile units--the relative importance of each component was reversed in the two urban areas. A similar situation prevailed in 1971, except that in Fort McMurray the importance of apartment units relative to mobile dwellings had increased. This was not the case in Edmonton, where mobile units accounted for an insignificant share of the housing market. Today, the proportion of the market accruing to apartment units is roughly similar in Edmonton and Fort McMurray, but the percentage of single detached units in the town is only one half the level in the city. The difference is accounted for by a significantly larger proportion of row housing and mobile dwelling units in the Town.

The proportion of apartments and row housing units that have been constructed in Fort McMurray since 1974 relative to the total number of new housing units is much higher than was anticipated in the early stages of the Syncrude development program. A number of factors have probably been responsible for the orientation away from single detached housing. These include: (1) problems of affordability because of relative changes in incomes and housing costs during the past five years; (2) the greater planning and construction resources inherent in developing single housing units versus higher density housing would probably have been considered in view of the construction pressures within the Town during the 1975-1977 period; (3) the longer lead times involved in producing single housing units combined with the continually upward-revised estimates of housing requirements would have exacerbated difficulties in providing a sufficient housing supply if the emphasis had remained on the construction of conventional single detached units; (4) the higher costs of developing areas which are difficult to service; (5) the higher cost of developing

Table 35. Historical composition of housing stocks, Edmonton[a] and Fort McMurray[b], 1961, 1966, 1971, 1976, 1978.

	1961		1966		1971		1976		1978
	Edmonton	Fort McMurray	Edmonton	Fort McMurray	Edmonton	Fort McMurray	Edmonton	Fort McMurray	Fort McMurray
Single detached	69.4%	91.7%	64.2%	61.1%	62.3%	62.7%	55.9%	37.3%	26.6%
Semi-detached or row	5.6	8.3	5.8	8.9	6.3	8.6	13.2	11.2	23.4
Apartment	24.4	0.0	29.6	6.7	30.7	10.8	29.8	20.6	29.1
Mobile	0.6	0.0	0.4	23.3	0.7	17.9	1.1	30.9	20.9
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[a] Adapted from original tables in City of Edmonton (1976).

[b] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1966, 1971, 1976) and Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

3 neighbourhoods simultaneously; (6) high standards of infrastructure and house construction; and (7) high local inflationary costs for labour and materials.

5.2.4 Housing Type by Industry Classification

Some special tabulations have been derived from the 1978 Fort McMurray Municipal Census regarding the occupancy of different types of housing by industry, as shown in Table 36. The table gives the percentage composition of occupied dwellings by type (single family, semi-detached, etc.) for the town as a whole, and for the employees within each industry classification.

More than three quarters of the employees in the mining sector were housed in single family or semi-detached units, or in townhouses, compared with an average of slightly more than one half for the town overall. This probably reflects the fact that the resource companies have attempted to increase the availability and affordability of permanent housing to their employees; also, the mining sector is characterized by a relatively high proportion of family households who prefer larger and more permanent types of housing.

In contrast, more than two thirds of the construction employees surveyed were housed in apartments or mobile homes, compared with an average of less than 50% for all sectors. This probably reflects the less permanent nature of employment in that industry, as well as the lower proportion of family households.

The remaining sectors do not exhibit such significant variations from the average housing mix. However, the transportation and communication sector, accommodation and food services sector, and the other community business sector together reported a 40% occupancy in the first three categories of housing types (single family, semi-detached, and townhouses) compared with the combined average for all industry classifications of almost 55%. The accommodation and food services sector was particularly underrepresented in the single family dwelling category, with a 20.5% occupancy compared with the town average of 30.4%.

Table 36. Housing accommodation types by major industry, Fort McMurray, 1978[a].

Industry Classification[b]	Single Family	Semi-Detached	Townhouse	Apartment	Mobile Home	Other	Total
Mining	36.0%	14.7%	27.0%	14.2%	8.2%	0.0%	100.0%
Construction	21.2	4.2	5.7	27.0	41.8	0.1	100.0
Transportation and Communication	31.2	4.0	5.0	21.8	37.2	0.7	100.0
Wholesale and Retail Trade, Finance, Insurance and Real Estate	34.1	8.3	7.3	23.2	27.1	0.0	100.0
Education Services	41.8	1.0	12.2	32.7	12.2	0.0	100.0
Accommodation and Food Services	20.5	11.0	13.7	28.8	21.9	4.1	100.0
Other Community Business	24.8	6.2	6.8	25.6	36.1	0.6	100.0
Government	38.5	3.9	7.5	23.6	25.7	0.9	100.0
Average[c]	30.4%	8.9%	15.1%	21.8%	23.5%	0.3%	100.0%

[a] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978). Accommodation relates to full-time employed males only.

[b] Smaller industry sectors have not been included in the table.

[c] Relates to composition of occupied dwellings only.

Table 37. Comparative housing tenure, Edmonton[a] and Fort McMurray, 1961 to 1981.

	1961	1966	1971	1976	1977[b]	1978[c/d]	1981 (est.)
Fort McMurray[e]							
Owned	70%	56%	55%	50%	34%	34% (41%)	ND
Lease-purchase	ND	ND	ND	ND	11%	13% (12%)	ND
Rented	30%	44%	45%	50%	49%	48% (43%)	ND
Other	ND	ND	ND	ND	5%	5% (4%)	ND
	100%	100%	100%	100%	99%[f]	100%	ND
Edmonton[g]							
Owned	65%	61%	55%	56%	ND	ND (ND)	48.9%-52.1%
Rented	35%	39%	45%	44%	ND	ND (ND)	47.9%-51.1%
	100%	100%	100%	100%	ND	ND	100%

[a] Edmonton defined as Census Metropolitan Area for years 1961, 1971, 1976. Edmonton sub-region estimate for 1981.

[b] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1977).

[c] 1978 Fort McMurray figures adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1978).

[d] Bracketed figures adapted from original tables in Department of Housing and Public Works (1978[a]).

[e] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1966, 1971, 1976). Only two categories, Owned and Rented, are distinguished.

[f] Figures do not add due to rounding.

[g] Adapted from original tables in City of Edmonton (1976).

Table 38. Comparative housing tenure by type of dwelling, Edmonton and Fort McMurray, 1976[a].

Dwelling Type	Tenure	Edmonton (CMA)[b] Number[c]	% of Total	% Owned/ % Rented	Fort McMurray Number[c]	% of Total	% Owned/ % Rented
Single Detached	Owned	87 765		87.5	1 170		74.5
	Rented	12 575		12.5	400		25.5
	Total	100 345	55.9	100.0	1 605	37.7	100.0
Single Attached	Owned	4 810		30.1	105		22.8
	Rented	11 160		69.9	355		77.2
	Total	15 975	8.9	100.0	460	10.8	100.0
Apartments	Owned	2 645		4.9	35		4.0
	Rented	50 895		95.1	840		96.0
	Total	53 540	29.7	100.0	865	20.4	100.0
Duplexes	Owned	2 775		35.5	15		50.0
	Rented	5 055		64.5	15		50.0
	Total	7 835	4.4	100.0	25	0.6	100.0
Movable Units	Owned	1 820		93.7	765		59.5
	Rented	120		6.3	520		40.5
	Total	1 945	1.1	100.0	1 295	30.5	100.0
Total Units	Owned	99 820		55.6	2 090		49.8
	Rented	79 810		44.4	2 110		50.2
	Total	179 635	100.0	100.0	4 220	100.0	100.0

[a] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1976).

[b] Census Metropolitan Area.

[c] Some figures do not add, owing to census rounding procedures.

5.2.5 Housing Tenure

Comparative housing tenure data for Fort McMurray and Edmonton are provided in Tables 37 and 38. In 1961, the level of home ownership was somewhat higher in Fort McMurray than in Edmonton, but over the study period the relative level of ownership has declined at a faster rate in the town. The 1976 Canada Census indicated that ownership levels in the town were marginally below those in the city. However, in Fort McMurray, lease-purchase agreements are fairly common among resource company employees, and it appears that the Census surveys treat such cases as if the housing were owner occupied. This may therefore overstate the real level of ownership in the community.

Local surveys have been undertaken in the town since 1976, and these further segregate tenure into owned, rented, lease-purchase, and other categories. Here again, it is not clear to what extent survey respondents consider that they own when in fact they are under a lease-purchase agreement. Whether lease-purchase is interpreted as owned or as rented accommodation, the figures suggest that Fort McMurray housing ownership levels have fallen relative to those in the Edmonton area. If lease-purchase tenure is not included as ownership, it would appear that relative housing ownership in Fort McMurray has fallen quite significantly below Edmonton levels; that is, 35% to 40% versus 50% to 55%. If the category is included as ownership, the relative level of ownership appears still to be somewhat lower than in the city.

Notwithstanding the evidence suggesting that relative home ownership in Fort McMurray has fallen below Edmonton levels (this may change over time as the oil sands operating work force becomes larger relative to the construction force, which is typically of a more temporary and transient nature), a 1978 survey of households indicated that local residents had a greater degree of tenure, as reflected in proportionate levels of ownership or lease-purchase, than in their previous residence (Department of Housing and Public Works 1978a). Indeed, it has been suggested that a greater opportunity to own one's home has been an important attraction of the town to prospective residents.

5.2.6 Dwelling Vacancies

Historical data regarding dwelling vacancies in Fort McMurray are not generally available, and the only consistent source of information prior to 1976 has been the periodic surveys of multiple-family dwellings (apartments and row housing) carried out by Alberta Housing and Public Works. Fort McMurray has been included in these surveys since 1970, and the results indicate that there were virtually no local vacancies for this type of dwelling until 1978, when a vacancy rate of 3.3% was exhibited.

The Fort McMurray municipal census contains housing vacancy information for 1976 and, in greater detail, for 1977 and 1978. This information for various dwelling types is given in Table 39. The figures indicate an overall vacancy rate of about 8% to 10.5% over the three years, with the highest vacancies shown for higher density, multiple-family dwellings and mobile units, and the lowest rates for single detached housing. The vacancy figures shown cannot necessarily be construed to reflect housing surpluses--the vacant units may be committed to expected arrivals and they may also recognize the rapid rate of turnover at which households have moved into and out of the community.

5.2.7 Cost of Housing Accommodation

5.2.7.1 Rental accommodation. Table 40 gives apartment rental rate information for Fort McMurray since 1971, based on periodic surveys carried out by the Alberta Department of Housing and Public Works. Over the period for which information is available, monthly rentals jumped sharply between 1971 and 1972, stabilized until 1974, and then climbed rapidly again from 1975 to 1977. Average rental rates increased again in 1978, but at a decelerated pace.

Rental rates in the Town are high compared to southern Alberta metropolitan centres. For one-bedroom apartments, rates are an average of 50% higher in Fort McMurray than in dormitory

Table 39. Housing vacancies, Fort McMurray, 1976 to 1978[a].

Type of Dwelling Unit	Vacancies		
	1976	1977	1978
Single Detached	ND	5.6%	4.0%
Semi-detached	ND	7.7%	9.6%
Townhouse	ND	14.1%	15.5%
Apartments	ND	5.3%	14.4%
Mobile	ND	10.2%	11.8%
Other	ND	1.6%	0.0%
Overall	8.9%	7.8%	10.5%

[a] Adapted from original tables in Department of Municipal Affairs. New Town of Fort McMurray: municipal census (1976, 1977, 1978).

Table 40. Average rental rates for apartment units, Fort McMurray, 1971 to 1978[a].

Year	Monthly Rates		
	1-Bedroom	2-Bedroom	3-Bedroom
1971 (October)	$140	$170	NA
1972 (October)	183	212	$245
1973 (October)	181	213	225
1974 (September)	196	230	282
1975 (December)	243	275	289
1977 (September)	307	354	370
1978 (August)	324	375	419

[a] Source: From original tables supplied by C. Okelee, Economist, Government of Alberta, Department of Housing and Public Works, in response to verbal communication 18 December 1978.

communities in the Edmonton region. Rentals for two- and three-bedroom apartments are more than one-third higher in the Town.

However, subsidized apartment rents are available to those working for such major employers as the provincial government, GCOS, and Syncrude, and the level of subsidy may amount to $200 per month or more. As shown in Table 41, rentals charged to provincial employees are particularly low relative to normal market rates; however, if recognition is given to the amenities and features (such as washers and dryers, leisure centres, large unit sizes, etc.) provided in Syncrude staff apartments, the rental rates charged in those instances would also seem to be well below market levels. A considerable amount of single-detached, duplex, townhouse, and mobile home rental accommodation has also been made available by the major resource companies and the provincial government, and these also carry subsidized rental charges. Adjustments are occasionally made to the rental rates charged by these agencies, but the increases have not been sufficient to close the gap with market rates; they have served to offset, to some degree at least, rates of inflation. It is not known how widespread is the practice among other local establishments of providing direct subsidized rental accommodation to employees.

For one type of housing, mobile homes, rental charges have apparently declined since the 1975 to 1977 peak period, when housing accommodation generally was in very tight supply. Since that time, alternative and more permanent housing types have been added to the market, and monthly market rentals have declined from about $600 per month for a three-bedroom mobile unit to a current level of $450-475.

5.2.7.2 Conventional housing. It is informative to review the changes that have occurred in Fort McMurray housing prices over the oil sands impact period, for this demonstrates in some manner the sorts of supply-demand pressures for men and materials that were incurred locally during this time. Of course, a large part of the supply of conventional housing and land has been provided by,

Table 41. Comparison of apartment rental rates, market and specified employee groups, Fort McMurray.

Apartment Units	Overall Market 1978[a]		Alberta Housing Corporation 1979[b]	Northward Developments Ltd. 1979[c]
	Average	Range	Average	Range
1-Bedroom	$324	$275-350	$120	$212-300
2-Bedroom	375	320-410	140	249-400
3-Bedroom	419	330-506	240	339-410
Includes:	NA		Utilities	Utilities Leisure Centre Washers/Dryers Cable TV/FM

[a] Adapted from original table in Department of Housing and Public Works (1978b).

[b] Source: Verbal communication with T. Conroy, Alberta Housing Corporation, Fort McMurray, 21 February 1979. Applies to provincial government employees.

[c] Source: Northward Developments Ltd. (1979). Applies to Syncrude employees.

or on behalf of, a small number of organizations such as Alberta Housing Corporation (AHC), Syncrude (Northward Developments Ltd.), and GCOS (Athabasca Realty Co. Ltd.), and a similar share of the demand has been allocated to a few employers, primarily Syncrude and GCOS. Consequently, the Fort McMurray housing market has never been characterized by a normal volume of arms-length market transactions which can be used to accurately gauge current market values. Nonetheless, Table 42 cites estimated market values for new, conventional, single-detached housing units at various points of time in the past and can be used to roughly illustrate historical changes in price levels.

From the GCOS construction period until 1973, and prior to the Syncrude construction impact, housing prices in the town increased moderately, at an annual rate of about 6% per year. Much of that increase appears to have been attributable to rising land costs. A report prepared at the end of 1973 indicated that at that time there was no significant difference in housing construction costs between Edmonton and Fort McMurray (Canadian Bechtel Limited 1974). By 1974, the first signs of a more rapid pace of escalation appeared as land and, more importantly, construction components increased housing prices by about 15%. The full brunt of both oil sands plant and municipal infrastructure construction impacted in 1975, and this had an immediate effect on local housing construction costs, which increased by about 40% in one year. Construction costs increased to a premium of 25% to 30% or more over Edmonton levels, as was indicated in an Alberta House Cost Comparison Study (Department of Housing and Public Works 1978c), which showed housing costs to be 27.2% higher than in Edmonton overall, with the labour and materials components 49.5% and 16.1% higher, respectively. The urgency of demand pressures necessitated more costly winter construction, but the competing demands for labour and, to a lesser degree, materials caused prices for those resources to jump sharply. As an inducement to attract construction labour, substantial amounts of overtime were authorized at rates of one and one-half to double normal wage rates. In addition, room and board or equivalent

Table 42. Prices of new single-detached housing units in Fort McMurray, 1967 to 1978[a].

Year	Lot Price[b]	House Construction	Total Price
1967	$ ND	$ ND	$ 23 000[c]
1970	4 500[d]	ND	ND
1971-1972	ND	ND	27 000[e]
1973 Fall	8,000	24 000-27 000	32 000-35 000[f]
1974	9,300	27 500-30 700	36 800-40 000[g]
1975	9.000- 9 500[h]	42 000[i]	51 000-51 500
1977	25 000	45 000	67 000-70 000[j]
1978 Spring	35 000	45 000	77 000-80 000[j]
1978 Fall	25 000-26 000	45.000	67 000-71 000[j]

[a] Defined as basic cost of 3-bedroom bungalow of approximately 1 100 square feet.

[b] Includes off site levies.

[c] Source: Canadian Bechtel Limited (1974). Average cost of GCOS single family home.

[d] Source: Verbal communication with Fort McMurray Agencies Ltd., February 1979.

[e] Source: Reid, Crowther & Partners Limited (1973).

[f] Source: Canadian Bechtel Limited (1974).

[g] Source: Edey, D. (1974).

[h] Source: Estimates based on verbal communication with Alberta Housing Corporation and Town assessment officials.

[i] Source: Chan and Webb (1975).

[j] Source: Estimates based on verbal communication with Alberta Housing Corporation, local realtors, and town assessment officials.

allowances had to be provided, and these amounted to an average of about $35 per man day.

After the initial surge, construction costs increased only modestly during the 1975 to 1978 peak demand period. New residential lots coming on stream continued to carry with them rapidly rising prices until 1978 and served to cause housing prices to peak in that year. A more balanced supply-demand situation and the recent introduction of lower priced residential lots in new subdivisions has caused prices to stabilize or in fact to decline from the 1978 peak.

At the present time, new housing prices in the town are somewhat below Edmonton levels. Lower land prices appear to more than compensate for construction costs which may amount to about 15% higher than those in the city. Winter construction and overtime labour premiums are not nearly as prevalent as before, although northern cost-of-living allowances are still provided. Material costs are somewhat higher because of added transportation costs to the community.

The impact of the relatively high costs of local housing which have prevailed in the past has been ameliorated for some employee groups at least, by the payment of special northern or isolation allowances or by direct programs permitting the rental or purchase of accommodation at subsidized rates. GCOS, Syncrude, and the provincial government are among the major employers offering favourable housing packages as part of their employment recruitment programs.

5.3 HOUSING IN THE REMAINDER OF THE AOSERP STUDY AREA

Housing statistics are not tabulated specifically for the AOSERP study area, but periodic benchmark information for specific communities, enumeration areas, and somewhat larger districts which encompass the AOSERP area is available from federal censuses and from miscellaneous community and regional reports. The historical reliability of housing data for outlying rural areas and settlements is questionable because of occasional changes in geographic boundaries and survey methodologies.

Table 43 provides a breakdown of the housing stock for I.D. 143, which covers an area in northeastern Alberta that includes the AOSERP area but extends somewhat farther in each direction and encompasses some additional small settlements such as Fort Fitzgerald. Although the numerical accuracy of the housing figures in the table is uncertain, it appears that, while the housing stock remained relatively unchanged in the 1961 to 1971 decade, the number of dwelling units has increased by about one quarter in the five-year period 1971 to 1976. Single-detached and mobile dwelling units accounted for most of the increase in housing during that period; together they account for 94% of the housing stock. Row housing, townhousing, and apartment units are, of course, more generally located in larger urban centres.

Most of the housing stock shown for I.D. 143 is located in the communities of Fort Chipewyan, Fort MacKay, and Anzac, which have about 240, 53, and 35 dwelling units respectively or about 80% of the total shown. At least 50 new housing units were developed in Fort Chipewyan between 1971 and 1976, which accounts for about 60% of the increase in housing stock shown for the Improvement District. Two thirds of the Improvement District housing stock was owner-occupied in 1976, compared to a level of three quarters in 1971.

Table 43. Housing stock, I.D. 143, 1961, 1971, 1976[a].

	Single Detached	Semi-detached/ Double	Single Attached	Apartment	Mobile	Total
1961[b]	301	5	5	5	5	321
1971	310	10	5	0	10	335
1976	345	5	20	0	50	420

[a] Adapted from original tables in Dominion Bureau of Statistics. Census of Canada (1961, 1971, 1976).

[b] 1961 and 1971 figures are available directly for the Improvement District. For 1976, figures have been estimated by compiling Enumeration Areas contained within the Improvement District.

6. INCOMES AND PRICES IN THE AOSERP STUDY AREA

6.1 RELATIVE INCOME LEVELS

Earlier analyses have shown that labour force participation rates in Fort McMurray, which lagged behind provincial levels in 1961, had by 1971 exceeded the Alberta average and have remained higher since then. The proportion of the total population that is employed remains somewhat lower in Fort McMurray than for the province generally, owing to larger family sizes, but the differential has continuously narrowed since 1961 and is now not significant (Fort McMurray 42.4%, Alberta 44.7%). Accordingly, the levels of local employment in Fort McMurray are generally comparable to the averages in the rest of the province. There is some considerable evidence, however, that relative levels of employment income are generally higher in the Town than in the province.

Table 44 provides some statistical data, based on taxation returns, regarding relative income levels of Fort McMurray compared to the rest of the province. Unfortunately, information for Fort McMurray is only available since 1966, when the local impact of the GCOS plant would already have begun. Before that time relative levels of income in Fort McMurray were probably no higher than the province. In one year, from 1966 to 1967 when much of the GCOS operating employment came on stream, average incomes in Census Division 12 increased from less than 85% of the provincial average to slightly more than 90%. That increase was probably attributable, at least in part, to rising average income levels in Fort McMurray, which at that time accounted for less than 10% of the population in Census Division 12. In 1967, income levels in Fort McMurray were 13% higher than the provincial average; that differential increased to about 22% to 24% in the period 1968 to 1971, dropped back to about 15% to 16% in 1972 to 1973, and increased again to a 1976 differential of 25% higher than the province, and 23% higher than in Edmonton. The decline during the 1972 to 1973 period may have been attributable to: (1) the phasing out of high-paying construction jobs; and (2) the stabilization of oil sands related operating

Table 44. Income and taxation statistics, Alberta, Edmonton, Fort McMurray, and outlying settlements, 1967 to 1976[a].

Year		Alberta	Edmonton	Fort McMurray	Outlying Settlements[b]
1967	Average income of taxable returns	$5 408	$5 494	$6 118	$4 727
	Average income of taxable returns relative to Alberta	100.0%	101.6%	113.1%	87.4%
	Proportion of total returns that are non-taxable	20.0%	15.3%	16.1%	40.9%
1968	Average income of taxable returns	$5,695	$5,910	$6,940	$4,958
	Average income of taxable returns relative to Alberta	100.0%	103.8%	121.9%	87.1%
	Proportion of total returns that are non-taxable	19.7%	15.1%	13.8%	37.4%
1969	Average income of taxable returns	$6 035	$6 353	$7 469	$5 034
	Average income of taxable returns relative to Alberta	100.0%	105.3%	123.8%	83.4%
	Proportion of total returns that are non-taxable	19.2%	14.3%	13.6%	34.8%
1970	Average income of taxable returns	$6 355	$6 649	$7 926	$5 540
	Average income of taxable returns relative to Alberta	100.0%	104.6%	124.7%	87.2%
	Proportion of total returns that are non-taxable	19.0%	13.2%	13.2%	35.1%

continued . . .

Table 44. Continued.

Year		Alberta	Edmonton	Fort McMurray	Outlying Settlements[b]
1971	Average income of taxable returns	$7 189	$7 490	$8 894	$6 046
	Average income of taxable returns relative to Alberta	100.0%	104.2%	123.7%	84.1%
	Proportion of total returns that are non-taxable	24.7%	19.7%	16.1%	41.2%
1972	Average income of taxable returns	$7 792	$8 028	$9 060	$6 636
	Average income of taxable returns relative to Alberta	100.0%	103.0%	116.3%	85.2%
	Proportion of total returns that are non-taxable	22.4%	18.4%	15.3%	36.7%
1973	Average income of taxable returns	$8 570	$8 619	$9 826	$6 947
	Average income of taxable returns relative to Alberta	100.0%	100.6%	114.7%	81.1%
	Proportion of total returns that are non-taxable	20.2%	17.4%	19.7%	29.9%
1974	Average income of taxable returns	$10 112	$10 218	$11 922	$7 059
	Average income of taxable returns relative to Alberta	100.0%	101.0%	117.9%	69.8%
	Proportion of total returns that are non-taxable	19.2%	16.5%	13.8%	28.1%

continued . . .

Table 44. Concluded.

Year		Alberta	Edmonton	Fort McMurray	Outlying Settlements[b]
1975	Average income of taxable returns	$12 959	$13 026	$15 922	$9 658
	Average income of taxable returns relative to Alberta	100.0%	100.5%	122.9%	74.5%
	Proportion of total returns that are non-taxable	28.7%	25.4%	18.2%	39.0%
1976	Average income of taxable returns	$14 323	$14 543	$17 871	$11 352
	Average income of taxable returns relative to Alberta	100.0%	101.5%	124.8%	79.3%
	Proportion of total returns that are non-taxable	27.7%	24.9%	16.8%	46.0%

[a] Adapted from original tables in Canada. Department of National Revenue. Taxation Division (1967-1976).

[b] Includes Anzac, Cheechum, Embarras Portage, Fort Chipewyan, and Waterways.

employment during that period combined with the influx of service sector related (and normally lower paying) jobs during the same time. During the 1967 to 1976 period, the proportion of total tax returns in Fort McMurray that were not taxable also remained consistently below provincial levels. That also reflects higher labour force participation rates and income levels in Fort McMurray compared to the province.

Earlier analyses showed that labour force participation rates in the remainder of the AOSERP area have been substantially lower than in Fort McMurray and the province generally, and that trends towards greater levels of employment and a closing of differentials with the rest of the province are not apparent. A measure of relative incomes in the remainder of the AOSERP area outside of Fort McMurray can also be derived from Table 44, which suggests that, notwithstanding lower rates of employment and labour force participation, income levels for those with employment earnings is also below provincial averages. In the period 1967 to 1976, average incomes in the outlying area, represented by taxable returns, ranged from about 70% to 87% of provincial levels. The lowest percentages have been evidenced in the more recent periods, suggesting that relative income levels in the area may be falling even farther behind the province generally. The proportion of tax returns that are not taxable because of low income levels is also significantly higher than for the province, in some years almost double the Alberta proportion[1].

Table 45, derived form 1971 Census information, provides a "snapshot" of relative individual and household incomes in Fort McMurray, I.D. 143, Alberta, and Edmonton in the year 1970, which

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[1] Analyses of 1971 Census Canada figures given later in the study suggest that the relative economic well-being of the area outside Fort McMurray as measured by taxable returns may be overstated. The large proportion of non-taxable returns (and, perhaps, non-filings) would not make the comparison of average incomes of taxable returns a valid one in terms of representing relative income levels in the area.

Table 45. Comparative individual and household incomes, Alberta, Edmonton, Fort McMurray, I.D. 143, 1970[a].

	Alberta	Edmonton	Fort McMurray	Improvement District 143
Average Employment Income				
All persons who worked in 1970				
Male	$6 461	$ 7 283	$ 8 303	$3 873
Female	3 007	3 201	2 661	2 489
Overall	5 255	5 714	6 669	3 530
Average Income of Head of Household				
Employment Income	7 514	7 522	9 332	2 956
Income from All Sources	7 628	8 367	9 716	3 912
Household Income				
Employment Income				
Family Households	8 862	10 151	11 307	4 688
Non-Family Households	4 084	4 888	7 955	3 289
All Households	7 937	9 042	10 957	4 459
Income from All Sources				
Family Households	9 936	11 266	11 769	6 019
Non-Family Households	5 226	5 985	8 304	4 089
All Households	9 024	10 153	11 407	5 650

[a] Source: Dominion Bureau of Statistics. Census of Canada (1971).

would reflect much of the local impact of the GCOS operation. The figures indicate that employed males and heads of households of Fort McMurray earned an average of about 15% and 25% more than their counterparts in Edmonton and Alberta, respectively. Male employment incomes in the remainder of the AOSERP area (based on I.D. 143) averaged from about 40% to 60% of those in Edmonton and Alberta, respectively, and from 30% to 50% of the Fort McMurray income levels. Incomes for employed females in Fort McMurray and the remainder of the AOSERP area, on the other hand, were 10% to 20% lower than provincial and Edmonton levels

Comparing incomes from all sources of heads of households, the differential between Fort McMurray, and Edmonton and Alberta drops somewhat because of lower levels of non-employment income in the town. That might be explained by the proportionately larger number of young families in the town who normally do not have the same level of alternative investment and other income. On the other hand, levels of income from all sources in I.D. 143 increased relatively, and this may be attributable to higher transfer payments in that area.

The net effect of (1) a slightly higher overall labour force participation rate in Fort McMurray than in Edmonton and Alberta, (2) higher employment incomes in Fort McMurray for males but lower for females, and (3) lower incomes in Fort McMurray from non-employment sources was that total incomes for all households in Fort McMurray in 1970 were about 12% higher than in Edmonton. If family and non-family households are segregated, the average incomes (all sources) of the former group were only 4.5% higher than in the city while, for the latter, incomes were about 39% higher. A comparison of the employment incomes of non-family households in Fort McMurray is particularly noteworthy, being about 63% higher than the comparative Edmonton levels. That phenomenon could be explained by the disproportionate participation in Fort McMurray of non-family household members in the high-paying construction industry and, even more specifically, in the more highly skilled trades categories.

6.2 CHANGES IN SALARIES AND WAGES

Based on an examination of the most recent taxation statistics and federal census tabulations, it is evident that average employment incomes in Fort McMurray are materially higher than in Edmonton (and Alberta). The differential is particularly marked with respect to non-family households (unattached persons). The statistical information that is available also suggests that income levels in the town have been increasing relative to those in the city.

Indications of the extent to which wage and salary levels in the town responded during the Syncrude construction period have been drawn from a number of sources. The large-scale local demand for manpower began in earnest in 1975 and appears to have caused a major upsurge in employment income levels extending beyond just the construction industry. There is inadequate information available, however, to confidently assess how equitably these income increases were distributed or how generally they applied among different industry sectors. There is some evidence that the income expectations created locally during the construction phase, which culminated at least in certain instances in extraordinary wage and salary settlements, may have become a semi-permanent fixture in Fort McMurray, even after the major demand pressures slackened. This has sometimes been referred to as a "ratchet effect". In other words, the awards of wages and benefits during the main impact period may set a precedent or a level of expectations which serve as a basis for future income adjustments; downward modifications in wage and benefit scales may be difficult to implement when pressures abate.

To the extent that unrealistically high income levels and benefit packages persist, this could have a detrimental effect on the local or regional development of industry sectors more competitively affected vis-a-vis other areas. The local retail trade sector, for example, particularly that component concerned with higher order goods subject to comparison shopping, could be constrained in terms of local development if it has to pay high

wage rates relative to its competition in, say, Edmonton. Regional development of other sectors, such as the forestry industry, may also be constrained by high prevailing costs of operation, which partially reflect high labour costs.

The Syncrude plant construction activity has set the pace for local income levels. Although union rates which are uniform in the northern part of the province applied to the Syncrude project, construction personnel were assured of 10 hours additional work per week at double normal rates. Effectively, this meant that income levels were as much as 50% higher than those of equivalent workers elsewhere in the province who were not availed of overtime work. Construction workers involved in urban projects also earned high incomes through overtime allowances and, depending on particular circumstances (some non-union contractors offered only one and one half normal wage rates for overtime), incomes were probably one third to one half over and above those in other areas. In addition, construction workers were either provided with first class room and board free of charge or allowed $35 per day to cover living costs. Consequently, their cost of living outlays were also limited.

Since 1977, construction activity has slowed at the plant site and in the town, and the number of construction workers has continued to fall. Overtime allowances for those remaining have also been reduced; therefore, the relative local impact of the extraordinarily high incomes associated with the construction force has been falling.

In 1975, northern cost-of-living allowances and isolation bonuses became widespread in Fort McMurray. The province implemented a $100 per month allowance for its employees in November 1974 (current level, $110); the school boards increased the existing $1,000 per year housing subsidy and northern allowance for its teaching staff to $2,200 per year; the town, citing the local cost of living, provided a $100 per month allowance in 1976 and increased that amount to $175 in 1977. These allowances, which in some cases have now been rolled into income scales, probably are equivalent to about 7% to 15% premiums over base salaries.

An example, though not necessarily representative, in which wage and salary levels increased significantly during the early phases of construction is found in the collective agreements between the Town of Fort McMurray and the Canadian Union of Public Employees (C.U.P.E.) Local 1505. In 1973 and 1974, the agreements called for wage increases which were generally in line with province-wide increases in earnings. In 1975, average increases in annual wages amounted to between 30% and 50% which, if the negotiated cost-of-living allowances were also included, brought the average increases to about 45% to 65%. Further adjustments since 1976 have been roughly comparable with those in the province, generally, but the initial surge has maintained relatively high remuneration levels.

The 1975-1976 agreement between C.U.P.E. and the Fort McMurray School District also called for a one-year increase in wages levels of about 25% to 30%. Since then, further increases have also been roughly similar to average increases elsewhere in the province.

A special salary and wage survey was undertaken by the Alberta Bureau of Statistics in 1975 and 1976. If the results of that survey are compared with the annual province-wide surveys in the same years, there is considerable evidence that local wage rates in the town gained relative to those in the province in that two-year period, although not necessarily uniformly over all job classifications covered.

If the value of benefits such as housing subsidies are included, equivalent incomes for major local employers such as the oil companies, the town, school boards, and provincial government are probably in the order of 15% to 20% or even higher than for counterpart employers elsewhere in the province. GCOS operating employees are reported to earn $0.50 to $0.75 more per hour than equivalent workers elsewhere plus are allowed two hours or more overtime work per week. School board teachers earn an extra allowance of $2,200 per year over salary grids which are generally comparable with the rest of the province. Provincial government employees receive a northern allowance of $110 per month plus benefit from subsidized

housing which is probably worth an additional $200 per month. Officials of the Town of Fort McMurray have estimated that 1978 wages of local municipal employees are about 10% higher than 1979 wage scales negotiated for urban centres in the general Edmonton area.

Data in respect to average incomes for various industry sectors are not available, although some information for specific employers is given in Table 46. The figures in the table suggest that average incomes in the resource industries are higher than those in the service sector, but lower than levels in the construction industry.

6.3 RELATIVE PRICE LEVELS

6.3.1 Fort McMurray

Since 1974, Fort McMurray has been included in the annual place-to-place price comparison survey carried out by the Alberta Bureau of Statistics. That survey measures differences in the level of prices for a standard selection of consumer goods and services between Edmonton, which is given a base index of 100, and each of a number of selected communities. The survey attempts to measure what an average Edmonton family would pay in each of the surveyed communities relative to what it would in Edmonton if it bought the same things in the same proportions everywhere. Table 47 provides detailed commodity price indexes for Fort McMurray compared to Edmonton. Over the five-year period demonstrated, no dramatic changes in relative price levels occurred in the town, but prices were consistently higher than the city's by 8% to 13%, and there was a trend toward a greater disparity in price levels from 1974 to 1977. The greatest price differential and the trend toward a somewhat higher overall price index were attributable to non-food as opposed to food items. In the non-food category, household shelter, household operation, and transportation prices appear to be particularly high--18% to 21% higher than city levels. Although the food price index has varied little from a level of about 10%

Table 46. Average annual incomes, Fort McMurray and selected local employers.

	Average Employee	Average Male	Average Female
Syncrude Canada Ltd.[a] (mid-1978)	$20 400	$21 200	$14 600
Provincial Government[b] (January 1979)	$16 271	$19 821	$12 016
Municipal Government[c]	$17 000-20 000	ND	ND
Average for Fort McMurray[d]	ND	$23 465	ND

[a] Estimated from unpublished demographic data from Syncrude Canada Ltd. (1978). Average incomes of GCOS employees are roughly comparable.

[b] Excludes employees of Keyano College. Source: Letter from D. McNeil, Alberta Public Service Commission, 15 February 1979.

[c] Approximate, based on discussions with municipal officials.

[d] Applies to principal household wage earners in the Town. The construction labour element would be included, which probably raises the municipal average considerably. Source: Department of Housing and Public Works (1978a).

Table 47. Comparative price levels, Fort McMurray and Edmonton, 1974 to 1977[a].

	Edmonton = 100				
	1974	1975	1976	1977	1978
All Items Index	108	111	108	113	113
Food	110	111	107	112	109
Non-Food	107	111	109	113	114
Food[b]					
Dairy	110	108	111	105	104
Cereal and Baking Products	101	102	103	104	98
Meat, Fish, Poultry and Eggs	118	117	101	107	105
Fruit and Vegetables	101	111	109	109	106
Frozen and Prepared	ND	ND	118	105	101
Restaurant Meals	ND	ND	ND	144	138
Miscellaneous	106	106	ND	ND	ND
Non-Food					
Household (Shelter)	ND	ND	ND	117	118
Household Operation, Utilities	ND	120	118	116	121
Furniture and Appliances	ND	97	ND	ND	ND
Household Supplies	ND	98	ND	ND	ND
Clothing	101	107	104	99	104
Transportation	105	121	108[c]	111	118
Health and Personal Care	114	116		110	105
Recreation, Leisure, Reading	99	122	110	125	106
Tobacco and Alcohol	104	103	ND	ND	ND

[a] Source: Bureau of Statistics. Spatial price comparison surveys (1974 to 1978).

[b] 1974 to 1976 food category includes only food consumed at home. 1977 total food index is high as a result of the inclusion of restaurant meals.

[c] Combines Transportation, and Health and Personal Care.

higher than in the city, the greatest difference appears to be in the restaurant meals category which, over the 1977-1978 period, has been approximately 40% higher than in the city. It would appear that the relative prices of perishable food items, particularly, have fallen over the period.

6.3.2 Fort Chipewyan

Fort Chipewyan was also included in the previously referenced price comparison surveys in 1976 and 1977. Although there are clearly statistical difficulties in attempting price comparisons between that small community and larger urban centres, the surveys indicated that overall price levels are markedly higher than in either Edmonton or Fort McMurray. The overall price index was 18% and 15% higher in Fort Chipewyan than in Edmonton in 1976 and 1977, respectively. The difference was particularly noticeable in the case of food items, which were one-quarter to one-third higher than in Edmonton. Non-food items were only 5% to 7% higher. The higher prices are no doubt due, in part at least, to the inaccessibility of the community and the requirement for goods to be air-freighted or barged in from the south.

A 1971 comparison between prices in Fort Chipewyan and Edmonton for a number of food and kitchen items was included in a report prepared at that time (Moncrieff, Montgomery and Associates Ltd. 1971). The comparison was certainly not as comprehensive as the more recent surveys carried out by the Alberta Bureau of Statistics, but it indicated that relative prices in Fort Chipewyan were about 50% higher than in Edmonton, with perishable foods as much as 100% to 150% higher and canned and non-perishable items 10% to 30% higher. If the results of that admittedly small survey can be used, relative price levels in Fort Chipewyan would appear to have fallen significantly over the past few years, and this could be due to various factors such as improvements in air freighting and transportation generally, and the larger and more competitive local community market for such goods.

7. IMPACT OF GROWTH ON REGIONAL AND LOCAL ECONOMY

7.1 INTRODUCTION

At the beginning of the study period, the AOSERP area was a relatively isolated part of the province with a small, predominantly native population. Under the primary impetus of commercial oil sands exploitation which began in the early 1960s, the regional economy has expanded rapidly, and that growth has paralleled the development of the two oil sands plants which now operate in the region. The following sections will review the nature and some of the relevant characteristics of the economic growth which has occurred.

7.2 REGIONAL ECONOMY

Prior to the development of commercial oil sands plants, the economy of the AOSERP study area was reliant on the area's function as a transportation thoroughfare to other regions in the far north, and on traditional resource industries such as hunting, fishing, trapping, and forestry. The scattered urban settlements, most significantly Fort McMurray, provided a basic level of services to the region. The development induced by the oil sands projects is notable in the following ways: (1) the projects have been of much greater magnitude and labour intensiveness than was ever anticipated; (2) the economic growth has been localized and concentrated in the Fort McMurray area; and (3) the oil sands operations now dominate the regional economy and constitute the only significant industry in which the output is destined for extra-regional markets.

At the same time, it appears that economic development associated with the oil sands has largely escaped the remainder of the AOSERP area. The impact of oil sands development on the remainder of the area has resulted in a decline of traditional industries in both absolute and relative importance over the past decade or more; and in employment and income levels, already low, lagging even farther behind those in the immediate vicinity of

Fort McMurray. Social infrastructure standards also appear to have lagged in much of the AOSERP area outside Fort McMurray because of the greater isolation, smaller population, poorer incomes, and undeveloped economy in that area. At the beginning of the study period, the population of the AOSERP area was also much more evenly distributed among the various settlements than it is now, when Fort McMurray dominates the entire northeast Alberta region.

Regional and urban infrastructure standards have improved in the region since 1961, particularly in the case of the Fort McMurray area which is now much more an integrated part of the provincial economy. The higher standards reflect to some degree the generalized improvements which have occurred throughout the province, but unquestionably the oil sands developments have directly and indirectly contributed to an important degree: in some instances, the oil sands projects have necessitated the improvements to enhance construction and operations; in other cases, the induced population and income impact of the projects has been such as to warrant expenditure for a higher and broader level of services and facilities.

Because the regional population has grown so rapidly and from such a small base, the impact of development on local residents and the extent to which local residents have participated in development can be meaningfully examined in only a limited way. Most of the population growth has been accommodated by in-migration from outside the region, and it would be difficult to define or identify the indigenous population of the region, particularly in Fort McMurray. Some observations have been made in this study regarding the economy of settlements in the outlying parts of the AOSERP area; those are predominantly native settlements, and it would appear that economic growth induced by the oil sands has largely bypassed those communities. There is some evidence, too, that many native persons who have participated in regional economic growth have originated from outside rather than inside the region. However, our knowledge regarding income and employment levels and changes thereof for native persons in both Fort McMurray and the

outlying areas is quite limited. Although overall employment and income levels in Fort McMurray are relatively high, information regarding the distribution of incomes and other benefits, such as housing subsidies and cost-of-living allowances, as between different employers and industries and occupational categories, between males and females, and between those working for wages and salaries and those on fixed incomes, such as pensioners, is quite limited. This makes it difficult to draw reliable conclusions as to the extent to which all population sub-sets have participated in the regional economic expansion that has occurred.

Some of the data developed in Sections 5 and 6 of this report suggested that certain employee groups may have especially benefited in terms of housing subsidies and allowances, and others, such as construction industry workers, from relatively high wage and benefit packages during the construction phases. Actual or perceived changes in absolute and relative levels of income among the resident population can carry with them significant socio-economic implications; for example, to name only a few possible effects, spending patterns may alter, animosities may develop among different population groups, and employee turnover rates may increase.

One concern regarding the impact of rapid oil sands induced growth is the possible effect of demand pressures during the construction phase on the relative level of regional wages and prices and the extent to which regional differentials may persist after these pressures have abated. The available research data are insufficient to estimate how important this phenomenon may have been in the AOSERP study area. Regional wage and price levels which are bid up during the periods of oil sands plant construction, and a "ratchet effect" which means that the relatively high levels continue to prevail over the long term, can adversely affect the development in the region of other more cost sensitive and competitive industries. Another related aspect is the effect that attractive wage and benefit packages that are offered during the construction periods, when the demand

for manpower is at a peak, may have on individual and long-term income expectations. It has been suggested, for example, that high wages paid to people for short periods may set a precedent wage level, resulting in subsequent reluctance to accept lower wages when demand pressures have eased. A number of factors (other than demand pressures) can be suggested to explain why wage and price levels may be particularly high during the plant construction phase: (1) the oil industry is less cost sensitive than many other industries; (2) the magnitude and complexity of the projects has meant that many construction activities are provided on a straight cost-plus arrangement, with little built-in incentive for reducing costs, because they can be passed along; and (3) the size of the investments involved dictates the importance of scheduling and of the time to complete the project; in other words, the capital costs on funds outstanding are sufficiently large that less importance may be devoted to wage and benefit packages and to the most efficient and least cost use of manpower, and more importance may be attributed to time savings. There is little question but that the urgency to complete the oil sands projects, and the associated premium costs, also spilled over into the infrastructure area, where costly winter construction and overtime allowances were implemented.

7.3 LOCAL ECONOMY

Most of the urban development that has occurred in response to the commercial exploitation of the oil sands has been focussed on Fort McMurray, which has grown by a factor of about 25 times since 1961. The size and economic base of the community has supported a substantially improved range and level of services.

The town has undergone two major periods of growth, coinciding with the construction of the GCOS and Syncrude plants, and separated by a relative pause from 1968 to 1971. Notwithstanding the fact that a large share of the direct project-related construction force of the two plants was domiciled in camps, the remaining workers and most of those involved in constructing the

necessary urban infrastructure resided in the town, and the impact to the community during the construction phase was large. The construction force was characterized by a significant proportion of single males working long hours for high wages. Seasonal cycles in activity were not apparent over the peak construction periods. About two thirds to three quarters of the way to project completion, the plant operating labour force began to build up and the service sector, which had shown signs of lagging in the early stages of development, began to expand. The growth in population of the town did not slow during the change-over from the construction to operating phases: outflows of construction labour were more than offset by inflows of operating and service sector employees, who typically have larger family sizes.

The direct impact of the construction camp vis-a-vis the Town of Fort McMurray is vague, and little can be said in this regard. The local spending patterns associated with both the plant and construction camp operation (for example, the amount of food, fuels, and supplies purchased in the town) and with the residents of the camps has not been documented, and it is not known how important these project- and camp-related expenditures were in terms of the town's trading market.

During the most recent Syncrude construction era, the provision of sufficient housing lagged behind demand and the expansion of the business service sector also was delayed. Reasons for the housing supply are probably attributable in some part to understated estimates of labour and housing requirements; one of the consequences of that, together with the high prevailing construction costs, was the development of a larger-than-anticipated proportion of medium- to high-density dwelling units, as opposed to single detached housing, and of a significant amount of mobile housing. It is not clear, on the basis of existing information, what factors contributed to the lag in service sector development in Fort McMurray over the 1974 to 1976 period and to what degree local labour demand pressures,

manpower turnover problems, and high wage, land, and construction costs may have played a restraining role.

Without further research, it is not possible to assess the effect that the lack of competition in a number of local sectors may have had on the Fort McMurray economy and to what extent this has affected price levels and service standards. In the analysis of the retail sector provided in an earlier part of the report, it was shown, for example, that the annual volume per outlet in Fort McMurray increased from about 80% of the provincial average to more than 155% in a two-year period. That, together with other data, suggests some lessening of competition in the town.

Today, Fort McMurray functions as a dormitory town for the commercial oil sands projects and as a regional service centre. The community has virtually no manufacturing base, except for a small number of enterprises serving local markets, and almost all equipment, consumable and durable goods and materials must be imported from outside the town and region. An increasing number and range of retail and service outlets are locating in Fort McMurray, although residents still look outside the region for a significant portion of higher order goods and personal services. At the time this report was prepared, the growth of the tertiary industry in the community was still under way, and it is too early to determine to what level it will expand without further basic economic stimulus.

8. MONITORING AND FORECASTING ECONOMIC IMPACTS

The task of monitoring the evolution of economic development in the Fort McMurray area has been materially assisted and enhanced over the past two to three years by the improvement in the availability of various types of data tabulations. Quarterly housing reports and annual, fairly detailed, municipal censuses have been particularly valuable. The town now compiles a comprehensive directory of local businesses. Earlier than about 1975-1976, however, the information base shows a marked deterioration and baseline states prior to the Syncrude impact are lacking. Even in the period since about 1975, the methodologies of many of the data assemblies have changed, and this adversely affects the comparability of results.

Some of the information and data gaps particularly evident include the following:

1. The effect of the oil sands-related construction impact on relative levels of wages and prices, and the cost of materials;
2. Baseline conditions and on-going changes in the size and structure of local employment, in the availability of local goods and services, in patterns of consumer expenditures, in conditions of employment, in business operating conditions, and in terms of local competition;
3. The effect of construction camp activities on the town in terms of the degree of interface between camp and town residents, and the amount and types of local expenditures;
4. Physical changes in the size and structure of the local business sector, by type of business;
5. Changes in the relative distribution of income as between various types of employees, families and households, ethnic and socio-economic groups; and
6. Changes in the local native population and native employment patterns.

This report has attempted to address many of the items summarized above, but data deficiencies have precluded a comprehensive overview and analysis without undertaking a much larger research effort. It is clear, however, that, had much of the required data been collected from the beginning of the 1961 to 1978 study period on an on-going or periodic basis, our understanding of the impact process would be more complete.

It should be noted that, at the time this research project was undertaken, the Fort McMurray economy had not yet stabilized subsequent to the Syncrude development. The community was still growing rapidly, the construction force still represented a sizeable share of the employment base, and a large number of service establishments were being added to the town's business sector. The 1979 to 1980 period may represent a more appropriate "baseline" state between resource development phases. During this time, it would be worthwhile to review the total local impact of the Syncrude project in terms of direct and indirect employment generation, the growth of the business sector, and population growth. With respect to population expansion, it may be possible to refine estimates of the "multiplier effect" of these major projects; this would assist in forecasting the impact of future projects on local communities.

This report cited some evidence that wage and price levels accelerated in Fort McMurray during the Syncrude construction period. It follows that the pressures to develop urban infrastructure coincidentally with plant construction may exacerbate local supply and demand conditions, contribute to higher wage and price levels, and possibly deter the timely development of more cost-sensitive service industries. A worthwhile area of investigation could involve an analysis of the relative costs and benefits of pre-building urban and regional infrastructure components prior to peak plant construction, thus levelling and spreading out the demand for men and materials, and possibly mitigating the severity of local pressures on prices and wages and, at the same time, possibly easing such problems as employee turnover.

9. REFERENCES CITED

The majority of the works cited in this report are included in Appendix 10.2 (Annotated Bibliography) and, to avoid duplication, have not been repeated here.

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10. APPENDICES

10.1 AN INTRODUCTORY SURVEY OF LOCAL BUSINESS DEVELOPMENT IN THE ATHABASCA OIL SANDS AREA

10.1.1 Introduction

The purpose of this component of the overall study was to carry out an introductory analysis of business development in the AOSERP study area, in order to examine the chronological pattern and structure of growth of the community business sector and to assist in an understanding of the nature of entrepreneurship that has accompanied oil sands development.

Research began with a review of telephone directories for Fort McMurray and Fort Chipewyan issued by Alberta Government Telephones in 1963 and from 1965 to 1978. No directory was issued in 1964, or prior to 1963. Fort MacKay and Anzac, the other communities in the study area, had no telephone systems and hence no directories. Additional data for 1978 were derived from a summary of business licences issued by the New Town of Fort McMurray. Data were transcribed from these sources onto simple chronological data sheets.

The budget and work schedule also allowed for some limited field work, and this was devoted to acquisition of as much additional information with respect to individual enterprises as possible, with emphasis given to those still present in Fort McMurray. Telephone calls were made to these enterprises in order to determine their chronological history more precisely and to learn more about the nature of their business. No effort was made to carry out in-depth interviews or to collect detailed information.

The chronological profiles that resulted (1058 in Fort McMurray, 34 in Fort Chipewyan) are preliminary in two respects. First, for most businesses they record only the type of business activity and whether it was present or absent in a given year. Usually there is no information about the size,

location, ownership or other characteristics of the enterprises. Second, the data are not consistent in quality and coverage; for current businesses three data sources were used--telephone directories, business licences, and telephone interviews--while for past businesses only the directories were used. Without question, some businesses were missed, and quite possibly some have been included that never had any existence beyond a telephone number or a business licence. Refinement of the chronological profiles would require a larger study.

Fort McMurray's chronological profiles were then sorted into categories corresponding to the Standard Industrial Classification (SIC) system, with some minor adjustments made to the coding system where necessary. Individual classes were then grouped into seven sectors and one miscellaneous grouping. The results presented in this report provide statistics on each industry sector along with some rudimentary analysis.

10.1.2 Presentation

For the communities of Fort McMurray and Fort Chipewyan, and for each business sub-sector in Fort McMurray, statistical tables are provided in the Appendix and are described below.

1. Enterprises and appearances. An enterprise is considered to be a business operation involved in a specific type of activity and, normally, one business establishment is equivalent to one enterprise. On occasion, however, a business firm may be desegregated into two or more enterprises where more than one type of activity is provided; for example, a hotel with a restaurant, or a combined insurance and real estate agency.

   An appearance occurs when an enterprise is found to be present in the community in one year. The total number of appearances for an enterprise equals the number of years for which that business was listed, the maximum number being 16 over the 1963 to 1978 review period.

2. Chronological evolution. The tables providing this information show the number of appearances of establishments in each year.
3. Selected ratios. Four ratios were calculated for each community, and in Fort McMurray, for each activity sector and sub-sector. The first is the ratio of enterprises appearing in 1978 to the number of enterprises that operated at one time or other from 1963 to 1978; this ratio provides a measure of the enterprises that have come and gone during the study period.

   The second ratio is called the "average run of appearances" and is the average number of appearances (equal to average years in operation) by enterprises within different groupings.

   The third ratio shows the proportion of total appearances for the 1963 to 1978 period that occurred prior to 1971; the fourth ratio shows the proportion that occurred in 1977 and 1978. These ratios highlight the different rates of development in various sectors and sub-sectors: some developed early and have been steady and on-going participants in the local economy (high pre-1971 ratios); others have developed more recently (high 1977 to 1978 ratios).

Each of the statistical tables is discussed in a brief commentary which includes relevant findings for the specific sector or community, and some special highlights. Because appearances constitute the primary type of data available, longevity is perhaps the most striking characteristic. Those enterprises listed in all 15 years are noted, along with any other particularly interesting or appropriate observations.

This section has been prepared such that the entire text precedes the statistical tables. This has been done to avoid the discontinuity of thought which might arise from interspersing the several tables among the relatively brief summary of observations.

10.1.3 Fort McMurray

10.1.3.1 Local business sector. Table 48 shows the number and percentage distribution of enterprises and appearances for each sector, including a miscellaneous grouping, and for all sectors combined. A total of 1058 chronological profiles were prepared for construction, retail, and service enterprises. Resource development enterprises were not included.

The 42 contract truckers shown are identified because they indicate another sub-sector for which chronological profiles could not be constructed, because these enterprises often do not take out telephone listings. In 1978, 42 of these enterprises were found to be operating, showing the sub-sector to be of significant size.

Table 49 describes the chronological evolution of the local business sector in Fort McMurray since 1963. Figures 2, 3, and 4 present some of the same data from the table in graphic form.

The average annual rate of growth in the number of local enterprises since 1963 has been 23.4%. Sector shares held by the various industry groups have changed significantly since 1963, when the largest grouping was transportation, followed by the retail and construction industries. By 1978, the construction industry was the largest in terms of number of establishments, and transportation was just one of several lesser sectors.

The retail group had, in 1978, about the same relative importance that it did in 1963. In the intervening years, however, it passed through a period of dramatic increase until 1971, fell away to a low point in 1976 during the time when the construction industry was reviving after its post-GCOS lull, and has recovered slightly in the last two years.

Year-to-year percentage changes in the number of establishments for each sector are shown in Table 49c. The largest relative increases in the number of enterprises occurred between 1963 and 1965. It is regrettable that 1964 data are not available so that a more precise chronology could be prepared. Over the

study period, enterprise formation in the construction industry was particularly volatile. The retail sector has fluctuated as well, but not nearly to the same degree. Observations relating to the other sectors are not meaningful because of the small numbers of enterprises involved. As a group, however, they too show less volatility than does the construction industry.

The decline of the construction sector from 1967 to 1970 is predictable since it corresponds with the completion of GCOS. The contemporaneous decline of the retail sector is more unexpected. It would appear that some over-investment occurred in retailing in 1967 and 1968. Ten years later, in 1977 and 1978, new retail enterprise formation was again very high. Data over the next three years will show whether the pattern of rapid formation followed by decline is repeated.

Table 50 provides the four ratios discussed earlier. These show that "services to travellers" has been the most stable sector, with enterprises arriving early and tending to persist. The transportation sector has also been long established, but the data suggest that a relatively low proportion of enterprises are still in operation. At the other extreme are the construction, and services to business management sectors, which show later starts and shorter average runs, indicators of more volatile enterprise formation.

Succeeding sections will show in more detail how sub-sector behaviour has contributed to these sectoral patterns.

10.1.3.2 Construction sector. The construction sector consists of three sub-sectors, whose enterprises and appearances are shown in Table 51. Table 52 shows the chronological evolution of this sector, and Table 53 shows the four ratios.

Section 10.1.3.2.1 which follows provides details concerning the special trades contractors. Enterprises in the construction supplies and services sub-sector make up a diverse group that includes equipment suppliers (sales and rental),

equipment parts suppliers and repair shops, bulk fuel dealers and welders, plus a small host of other specialized enterprises.

All the data indicators confirm the relative instability of this sector and the rapid enterprise formation that has taken place since 1971. The development of special trades contractors since that time has been particularly dramatic.

No contractors have persisted for the entire 16-year period. The two listed in 1963--C.H. Peden Construction Ltd. and the Demers Contracting Company Ltd.--were last listed in 1975 and 1974 respectively. Among those present in 1965, only Laird Electric and Redwood Readymix Ltd. were listed in 1978. Fort McMurray Plumbing and Heating arrived in 1966.

Some of the construction supplies and services enterprises have been more durable. Two bulk dealers--Gulf (B.A.) and Imperial Oil--and Canadian Propane operated in 1963. Shell arrived in 1966. Their markets, of course, are not confined to construction.

10.1.3.2.1 Special trades contractors. Tables 54, 55, and 56 provide statistics regarding special trades contractors. They leave the impression that this type of enterprise was more prevalent in the Syncrude construction and post-construction periods than in the years around the GCOS era, although one can only speculate on the reasons for this.

10.1.3.3 Transportation sector. The statistics for the transportation sector are shown in Tables 57 to 59. The most stable sub-sectors are major passenger carriers (Pacific Western Airlines, Northern Alberta Railways, and Greyhound) and long-distance truckers. Barge transportation operations have not been included. The least stable sub-sector comprised local delivery truckers.

Among local operators, Brooks Taxi, Leitners Taxi, Contact Airways, and Caouette Transport persisted from 1963 to 1978. Diversified Transportation Ltd. was first listed in 1968.

10.1.3.4 Retail sector. Tables 60 to 62 show the statistics for the retail sector and for 12 sub-sectors. The "other" category includes such diverse enterprises as toy stores, camera shops, news and tobacco shops, music stores, etc.

The various statistics in this sector show it to be remarkable neither for stability nor transience. But the different sub-sectors exhibit considerable variability. Unsurprisingly, the major department stores (Hudson's Bay and Sears Mail Order) are most stable, followed closely by drug stores, and hardware and building supplies stores.

The most unstable and transient sub-sectors comprised the mobile home sales and service, furniture and appliances, and "other" categories. Major department stores and drug stores had a relatively large proportion of appearances before 1971, with sporting goods, furniture and appliances, gift and craft stores, and "others" concentrating more heavily in the last two years.

This sector contains some very durable enterprises in addition to the department stores. Hill Drugs and Haxton's General Stores were both operating in 1963. Robinsons Stores was listed from 1965 to 1978, as was McMurray Hardware.

Data for the automotive group are difficult to interpret because of the large number of multi-purpose enterprises: car dealers sell gasoline and make repairs; car wash operations sell gasoline; repair shops double as tire stores, etc. The 1978 listings contained some long-standing names: Fort McMurray Esso (1966), National Tire (1965), Andy's Service and Repair (1963), and Young's Motors (1965).

10.1.3.5 Finance, insurance and real estate sector. Tables 63 to 65 describe this sector. As would be expected, banks make up its most stable sub-sector. The Royal Bank was operating in the community in 1963, and the latest arrival was the Bank of Montreal in 1975. The Bank of Nova Scotia (1966) added a second branch in 1977. Other credit agencies have either not lasted long or have arrived quite recently.

Among general insurance agencies, only Fort McMurray Agencies has operated longer than 10 years (1967 to 1978). Other firms either have commenced recently, or did not last. The only long-term real estate agency was Athabasca Realty, GCOS's housing agency. Most real estate enterprises have arrived late and are still operating.

10.1.3.6 Services to business management sector. The statistics for this small sector and its various sub-sectors are given in Tables 66 to 68. For most of the period the sector has contained only accountants and consultants, the former providing a more durable presence than the latter.

The longest entrant in this sector is J.E. Fowers an accountant, who was listed in 1965 under McClary and Company, in 1966 under Ernst and Ernst, and from 1967 onward under his own name. Stanley and Associates, engineering consultants, have maintained a listing since 1966.

10.1.3.7 Personal services sector. The chronology of this sector is described statistically in Tables 69 to 71. Under the barbers and beauty shops sub-sector, the Park Plaza Beauty Shop and Peter Pond Barber Shop have listings that go back to 1965.

The recreational sub-sector appears to be increasing in importance. For many years it comprised only the Fort Theatre (McMurray Theatre), but since 1974 it has expanded to include a variety of boat rental, sport fishing, bowling, and other enterprises.

10.1.3.8 Services to travellers sector. As was discussed earlier, this has been a very stable sector. The various sub-sectors have all been more stable than average, with hotels and motels, and car rental agencies being particularly so. Relevant statistics are given in Tables 72 to 74.

The hotel sector began with the McMurray Hotel, later called the Oil Sands Hotel, and now the Oilsands Motor Inn. The

1965 directory contained five new listings, of which three are still listed in their original names: the Riviera, the Peter Pond, and the Prairie View. Long-standing restaurants have been attached to the various hotels: the Oil Sands, the Peter Pond, and the Riviera. A dramatic jump in the number of restaurants has been evident in 1977 and 1978.

In car rentals, Avis, Tilden, and Hertz have steady listings going back to 1965 and 1966.

For many years Fort McMurray had only one travel agency. It began as Yellowknife Travel in 1965, was transformed into J.C. World Travel in 1972, and to Marlin Travel, under Edmonton-based ownership, in 1977.

10.1.3.9 Other enterprises sector. Statistics for this group are shown in Tables 75 to 77. The enterprises have tended to be fairly unstable, or of recent origin.

The unclassified enterprises are usually those which had listings for a period of time under names that gave no clue to the business purpose, and then stopped. For those firms, no current telephone number or address could be found to provide a point of contact.

10.1.4 Fort Chipewyan

Listings were found for a total of 34 enterprises in Fort Chipewyan over the period since 1963, and that number was considered insufficient for organization into sectors. Chronological data are given in Table 78. These statistics show a steady if unremarkable expansion in the business sector of the community. Table 79 shows the four ratios for all enterprises in Fort Chipewyan.

Not surprisingly, the ratios for Fort Chipewyan show a more stable pattern than was evidenced in Fort McMurray.

Fort Chipewyan has a number of long-standing listings. Alberta Power and Pacific Western Airlines have histories of service to the community running from 1963 and 1967, respectively. The Hudson's Bay Company is also a long-standing institution, going back to early fur-trading days.

Among local owners, members of the Mah family have the longest continuous record. The original Mr. Mah was for many years operator of a cafe and rooming house, and his son Dick Mah continues the cafe business in the Athabasca Cafe. Rooms were discontinued about 1970. George Mah has had a varied entrepreneurial career. Mah's Hall has had a continuous listing since 1963. In 1966 George's B.A. (later George's Gulf) appeared, along with George's Taxi. In 1975 the latter firm was discontinued (two other taxi companies were listed that year), and George's Car and Truck Rental appeared.

The CMC Co-op Store, under President Noel MacKay, is one of the most successful native co-operatives in Alberta, and was first listed in 1967. The store began in a small log building, then took over an existing store structure, from which it operated until 1978. In that year, with some help from both Provincial and Federal governments, the Co-op moved into a new building.

In 1971 Noralta Flights (Lawrence Yanik) was first listed. Two years previously, John Engels' Pine Creek Construction appeared. In 1972 Clarke Enterprises, a garage, started up, and the Clarke family has diversified into other activities since then. In 1977 Mrs. Clarke reopened the old Delta Lodge as the Caribou Inn, and proposes to open Maureen's Bakery in the near future.

One of the least stable components of the Fort Chipewyan business community has been hotels. Aside from the Athabasca Cafe, six listings occurred with an average duration of 2.3 appearances (years). Two of these are listed in 1978: the Caribou Lodge and Chadi's Motel (formerly Jumbo's).

10.1.5 Conclusions and Recommendations

10.1.5.1 Conclusions. The data which have been collected and analyzed as part of this assignment are inadequate in many ways and will remain so until they can be verified and supplemented by personal contact with a wide range of local residents and businessmen. They are also of limited usefulness in that they record only

the presence or absence of a listing for an enterprise, and not any of its important characteristics beyond its general purpose. Data related to construction enterprises, because of the relative transience of those businesses, are probably less reliable than data for the other sectors.

But assuming the data, within their limitations, are reasonably accurate, they begin to throw some light on the kinds of entrepreneurship that have been exhibited in the Fort McMurray area, which might be classified in three ways:

1. Local entrepreneurship--enterprises created by people of established residency in the region;
2. Transplant entrepreneurship--enterprises created by people from outside who established residency for the purpose of creating these enterprises;
3. Non-resident entrepreneurship--enterprises created from outside the community.

Present information does not allow for any quantitative estimate of the prevalence of each kind, or of shifts over the study period.

Two general conclusions can be drawn from the data at this stage, however. First, Fort McMurray has provided a fertile ground for entrepreneurship of all kinds, and apparently continues to do so. Opportunities have been quite varied, extending into many types of construction, wholesale, retail, and service enterprises. Also, apparently there have been opportunities for enterprises of many different scales, from large employers down to one-person operations.

Second, entrepreneurial opportunities induced by oil sands development have been mainly confined to Fort McMurray. No comparable environment has existed in Fort Mackay, Anzac, or Fort Chipewyan.

10.1.5.2 Recommendations for further research. As a result of this research, chronological data sheets exist for 1100 businesses organized into various sectoral groupings. This provides a fine

resource which could be used as a basis for future research. The next steps would be:

1. Intensive examination of a sample of sectors, with proper field work, in order to expand the data set to include a full range of important variables, such as:
   a) More precise start-up and close-down dates;
   b) Ownership;
   c) Location and scale of operation;
   d) Goods and services produced or offered;
   e) Employment and sources of labour;
   f) Customers; and
   g) Volume of business.

   The sectors chosen for this first step should be as representative as possible of the range of possible enterprise types.
2. Development of methods and programs for computerized storage and analysis;
3. Intensive examination of all sectors; and
4. Analysis of results.

This analysis would provide a more comprehensive understanding of historical changes in the local business sector and would provide a baseline state from which future growth could be compared and monitored.

Table 48. Number of enterprises and appearances in local business community by industry sector, Fort McMurray.

Industry Sectors	Total Enterprises Through Period		Total Appearances Through Period	
	No.	%	No.	%
Construction	381	36.0		29.7
Transportation	67	6.3	333	9.7
Retail	284	26.8		29.5
Finance, Insurance and Real Estate	53	5.0	221	6.5
Services to Business Management	57	5.4	152	4.4
Personal Services	64	6.0	213	6.2
Services to Travellers	59	5.6	288	8.4
Miscellaneous and Unclassified	93	8.8	186	5.4
Total	1058	100.0	3417	100.0
Contract Truckers[a]	42			
Grand Total	1100			

[a] Refer also to Table 57.

Table 49. Chronological evolution of local business community, Fort McMurray, 1963 to 1978.

Table 49a. Chronological evolution of industry sector, Fort McMurray, 1963 to 1978.

Industry Sectors	Number of Establishments															
	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Construction	5	ND	18	24	27	25	23	20	23	34	62	86	119	155	174	220
Transportation	11	ND	11	16	14	16	18	19	16	17	24	30	35	35	35	36
Retail	7	ND	25	30	38	50	47	45	52	59	73	78	91	100	134	180
Finance, Insurance and Real Estate	1	ND	4	5	6	8	9	10	10	13	17	21	22	25	36	34
Services to Business Management	0	ND	1	2	2	2	3	3	4	5	12	13	23	23	27	32
Personal Services	1	ND	6	6	5	8	10	10	9	11	12	11	20	25	32	47
Services to Travellers	2	ND	13	13	15	16	15	15	15	17	19	22	24	28	32	42
Miscellaneous and Unclassified	0	ND	3	0	1	5	4	2	4	7	12	21	29	26	30	42
Total	27	ND	81	96	108	130	129	124	133	163	231	282	363	417	500	633

Table 49b. Chronological evolution of sector shares, Fort McMurray, 1963 to 1978[a].

Industry Sectors	Sector Composition															
	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Construction	.19	ND	.22	.25	.25	.19	.18	.16	.17	.21	.27	.30	.33	.37	.35	.35
Transportation	.41	ND	.14	.17	.13	.12	.14	.15	.12	.10	.10	.11	.10	.08	.07	.06
Retail	.26	ND	.31	.31	.35	.38	.36	.36	.39	.36	.32	.28	.25	.24	.27	.28
Finance, Insurance and Real Estate	.04	ND	.05	.05	.06	.06	.07	.08	.08	.08	.07	.07	.06	.06	.07	.05
Services to Business Management	.01	ND	.01	.02	.02	.02	.02	.02	.03	.03	.05	.05	.06	.06	.05	.05
Personal Services	.04	ND	.07	.06	.05	.06	.08	.08	.07	.07	.05	.04	.06	.06	.06	.07
Services to Travellers	.07	ND	.16	.14	.14	.12	.12	.12	.11	.10	.08	.08	.07	.07	.06	.07
Miscellaneous and Unclassified	.00	ND	.04	.00	.01	.04	.03	.02	.03	.04	.05	.07	.08	.06	.06	.07
Total	1.00[b]	ND	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 49c. Chronological evolution of all industry sectors, Fort McMurray, 1965 to 1978[c].

Industry Sectors	Year-to-Year Rate of Change (%)													
	1965[d]	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Construction	90	33	13	-7	-8	-13	15	48	82	39	38	30	12	26
Transportation	0	45	-12	14	13	6	-14	6	41	25	17	0	0	3
Retail	90	20	27	32	-6	-4	16	13	24	7	17	10	34	34
Finance, Insurance and Real Estate	100	25	20	33	13	11	0	30	31	24	5	14	44	-6
Services to Business Management	0	100	0	0	50	0	33	25	140	8	77	0	17	19
Personal Services	145	0	-17	60	25	0	-10	22	9	-8	82	25	28	47
Services to Travellers	155	0	15	7	-6	0	0	13	12	16	9	17	14	31
All Industry Sectors	73	19	13	20	-1	-4	7	23	42	22	29	15	20	27

[a] Each element contains each sector's proportion of total enterprises in a given year.

[b] Columns should add to 1.00, but may not do so due to rounding.

[c] No data is available for the years 1963 and 1964 for this section of Table 49.

[d] 1965 elements are annual rates, calculated assuming equal percentage increases in 1964 and 1965.

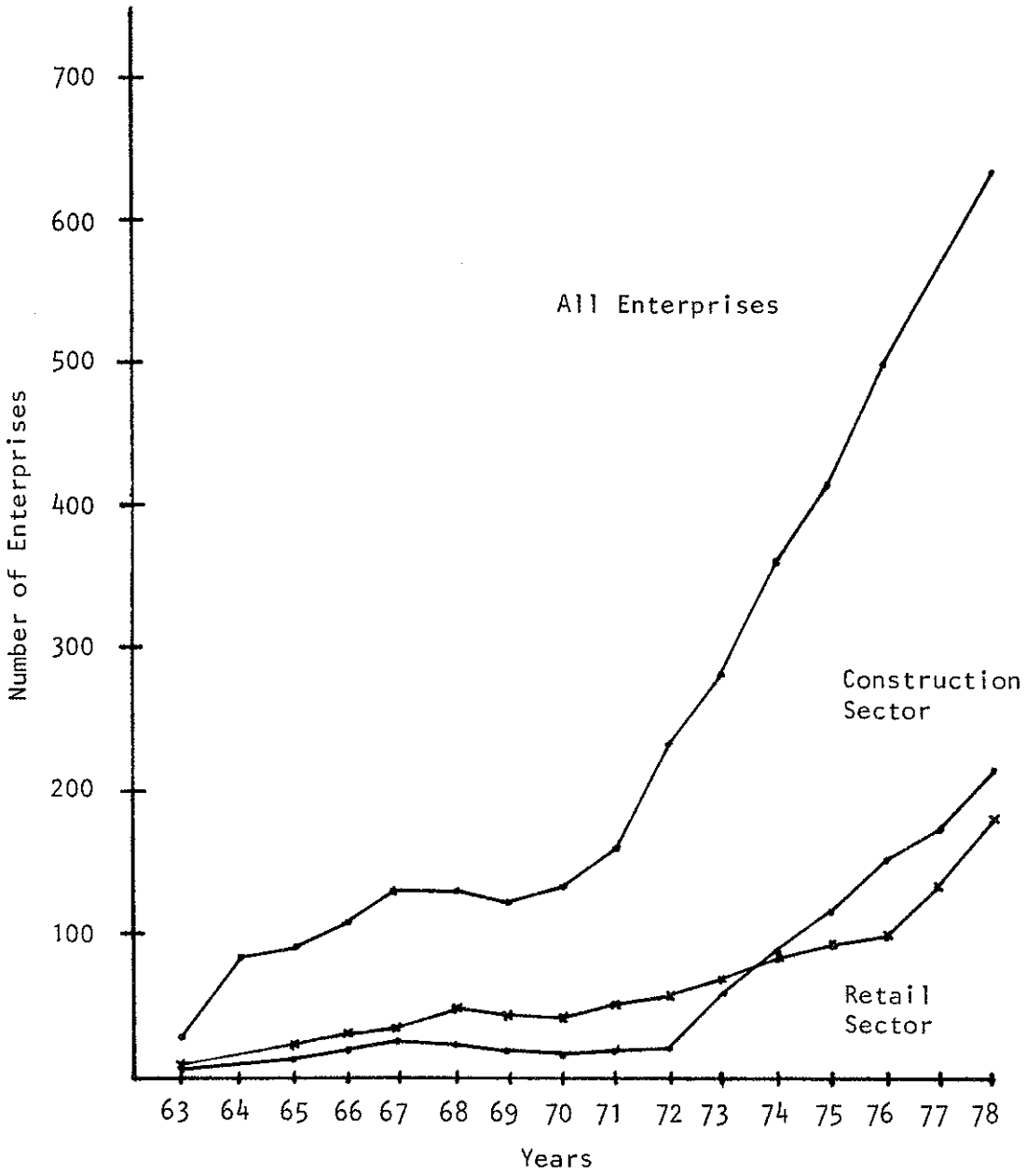

Figure 2. Chronological evolution of local business sector, and of major industry groups, Fort McMurray, 1963 to 1978.

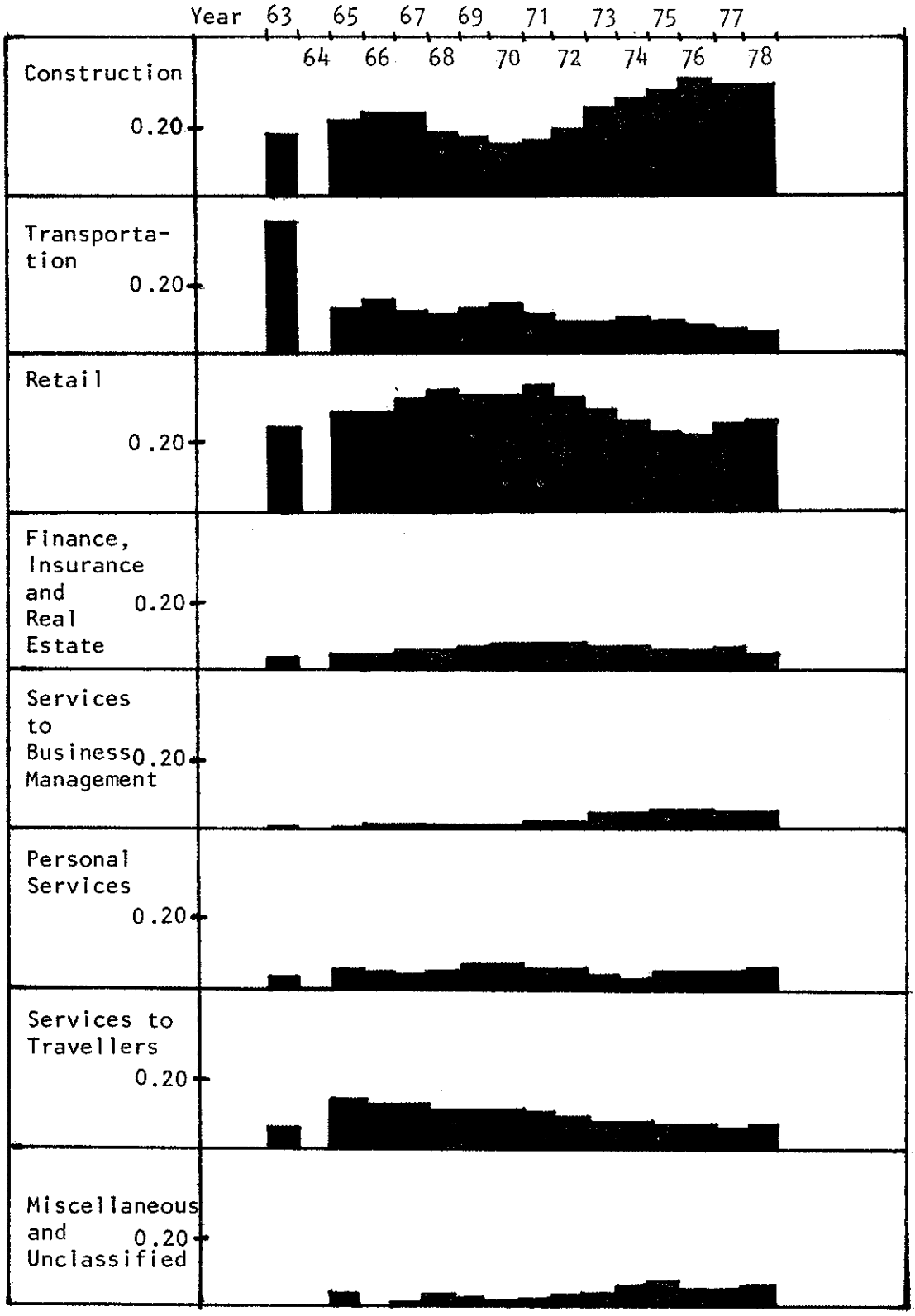

Figure 3. Shares of local business sector by industry group, Fort McMurray, 1963 to 1978.

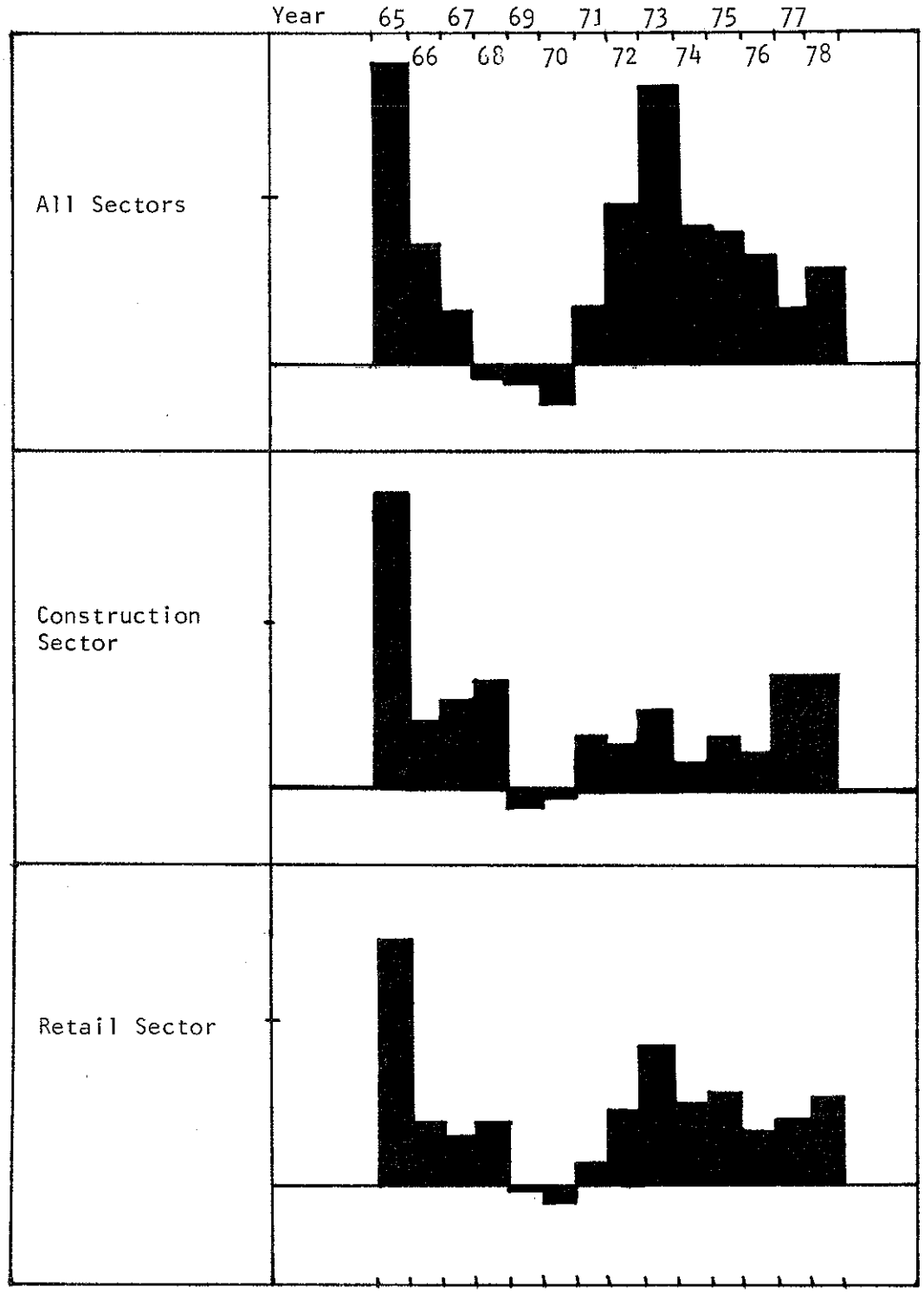

Figure 4. Annual rates of change in number of enterprises, local business sector and construction and retail groups, Fort McMurray, 1965 to 1978.

Table 50. Selected chronological ratios of local business community by industry sector, Fort McMurray.

Industry Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
Construction	0.58	2.7	0.14	0.39
Transportation	0.54	5.0	0.32	0.21
Retail	0.63	3.6	0.24	0.31
Finance, Insurance and Real Estate	0.64	4.2	0.19	0.32
Services to Business Management	0.56	2.7	0.09	0.39
Personal Services	0.73	3.3	0.22	0.37
Services to Travellers	0.71	4.9	0.31	0.26
All Enterprises	0.60	3.2	0.20	0.33

Table 51. Number of enterprises and appearances in the construction sector, Fort McMurray.

SIC	Construction Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
409	General and Unclassified Contractors	107	28.1	239	23.5
421	Special Trades Contractors	182	47.8	476	46.9
480	Construction Supplies and Services	92	24.1	300	29.6
	Total Construction Sector	381	100.0	1015	100.0

Table 52. Chronological evolution of the construction sector, Fort McMurray, 1963 to 1978.

SIC	Construction Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
409	General and Unclassified Contractors	2	ND	8	11	8	6	6	5	4	8	14	20	28	39	34	46
421	Special Trade Contractors	0	ND	3	7	10	11	10	8	11	16	27	40	51	68	91	123
480	Construction Supplies and Services	3	ND	7	6	9	8	7	7	8	10	21	26	40	48	49	51
	Total Construction Sector	5	ND	18	24	27	25	23	20	23	34	62	86	119	155	174	220

Table 53. Selected chronological ratios of construction sector, Fort McMurray.

SIC	Construction Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
409	General and Unclassified Contractors	0.43	2.2	0.19	0.33
421	Special Trades Contractors	0.68	2.6	0.10	0.45
480	Construction Supplies and Services	0.55	3.3	0.16	0.33
	All Construction Sub-Sectors	0.58	2.7	0.14	0.39
	All Sectors	0.60	3.2	0.20	0.33

Table 54. Number of enterprises and appearances of special trades contractors, Fort McMurray.

Types of Special Trades Contractors	Total Enterprises Through Period		Total Appearances Through Period	
	No.	%	No.	%
Roofing	7	3.8	12	2.5
Excavation and Landscaping	29	15.9	91	19.1
Floor Covering	9	4.9	15	3.2
Electrical	25	13.7	71	14.9
Mechanical, Plumbing and Heating	29	15.9	81	17.0
Carpentry	24	13.2	49	10.3
Drywall	14	7.7	31	6.5
Insulation	4	2.2	5	1.1
Concrete	14	7.7	50	10.5
Painting	14	7.7	46	9.7
Other	13	7.1	25	5.3
Total Special Trades Contractors	182	100.0	476	100.0

Table 55. Chronological evolution of special trades contractors, Fort McMurray, 1963 to 1978.

Types of Special Trades Contractors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Roofing	ND	ND	0	0	0	0	0	0	0	1	1	1	2	3	2	2
Excavating and Landscaping	ND	ND	1	2	4	3	3	2	4	3	6	9	11	14	13	16
Floor Covering	ND	ND	0	0	0	1	0	0	0	0	0	0	2	2	4	6
Electrical	ND	ND	1	1	1	2	3	3	3	4	7	7	7	9	10	13
Mechanical, Plumbing and Heating	ND	ND	0	3	3	2	2	1	1	2	6	8	9	11	14	19
Carpentry	ND	ND	0	0	0	0	0	0	0	0	1	4	4	6	12	22
Drywall	ND	ND	0	0	0	0	0	0	1	2	2	2	4	5	5	10
Insulation	ND	ND	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Concrete	ND	ND	1	1	2	2	1	1	1	2	2	4	4	8	10	11
Painting	ND	ND	0	0	0	1	1	1	1	2	2	4	4	5	11	14
Other	ND	ND	0	0	0	0	0	0	0	0	0	1	4	5	7	8
Total Special Trades Contractors	ND	ND	3	7	10	11	10	8	11	16	27	40	51	68	91	123

Table 56. Selected chronological ratios of special trades contractors, Fort McMurray.

Types of Special Trades Contractors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
Roofing	0.29	1.7	0.00	0.33
Excavating and Landscaping	0.55	3.1	0.16	0.32
Floor Covering	0.67	1.7	0.07	0.67
Electrical	0.52	2.8	0.15	0.32
Mechanical, Plumbing and Heating	0.66	2.8	0.14	0.41
Carpentry	0.92	2.0	0.00	0.69
Drywall	0.71	2.2	0.00	0.48
Insulation	0.50	1.3	0.00	1.00
Concrete	0.79	3.6	0.16	0.42
Painting	1.00	3.3	0.07	0.54
Other	0.62	1.9	0.00	0.60
All Special Trades Contractors	0.68	2.6	0.10	0.45
All Construction Sub-Sectors	0.58	2.7	0.14	0.39
All Sectors	0.60	3.2	0.20	0.33

Table 57. Number of enterprises and appearances in the transportation sector, Fort McMurray.

SIC	Transportation Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
500	Major Passenger Carriers	3	4.5	43	12.9
501	Aircraft Charter and Services	17	25.4	69	20.7
506	Household Movers	8	11.9	31	9.3
507	Local Delivery Truckers	11	16.4	30	9.0
507	Long Distance Truckers	9	13.4	60	18.0
512	Taxis and Local Buses	19	28.4	100	30.0
	Sub-Total Transportation Sector	67	100.0	333	100.0
	Contract Truckers[a]	42			
	Total Transportation Sector	109			

[a] Because these enterprises do not normally maintain separate telephone listings, it was not possible to trace this part of the transportation sector chronologically. Most of the 42 truckers recorded came from the 1978 business licence records.

Table 58. Chronological evolution of the transportation sector, Fort McMurray, 1963 to 1978.

SIC	Transportation Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
500	Major Passenger Carriers	2	ND	2	3	3	3	3	3	3	3	3	3	3	3	3	3
501	Air Charter and Service	2	ND	2	2	2	3	4	5	3	2	4	7	7	7	9	10
506	Household Movers	0	ND	0	0	1	2	2	2	2	2	2	2	4	4	3	5
507	Local Delivery Truckers	1	ND	2	2	1	1	1	1	0	0	2	4	3	3	4	5
507	Long Distance Truckers	1	ND	1	3	2	2	2	2	2	3	5	5	8	8	9	7
512	Taxis and Local Buses	5	ND	4	6	5	5	6	6	6	7	8	9	10	10	7	6
	Total Transportation Sector	11	ND	11	16	14	16	18	19	16	17	24	30	35	35	35	36

Table 59. Selected chronological ratios of transportation sector, Fort McMurray.

SIC	Transportation Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
500	Major Passenger Carriers	1.00	14.3	0.44	0.14
501	Air Charter and Services	0.59	4.1	0.29	0.28
506	Household Movers	0.63	3.9	0.23	0.26
507	Local Delivery Truckers	0.45	2.7	0.30	0.30
507	Long Distance Truckers	0.78	6.7	0.22	0.27
512	Taxis and Local Buses	0.32	5.3	0.37	0.13
	All Transportation Sub-Sectors	0.54	5.0	0.32	0.21
	All Sectors	0.60	3.2	0.20	0.33

Table 60. Number of enterprises and appearances in the retail sector, Fort McMurray.

SIC	Retail Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
631	Food and Related Stores	44	15.5	154	15.3
642	Major Department Stores	2	0.7	27	2.7
650	Automotive (All Types)	55	19.4	209	20.7
660	Clothing Stores	53	18.7	184	18.2
673	Sporting Goods Stores	9	3.2	28	2.8
673	Hardware and Building Supplies	17	6.0	89	8.8
675	Mobile Home Sales and Service	8	2.8	21	2.1
676	Furniture and Appliances	28	9.9	74	7.3
678	Appliance Service and Repair	18	6.3	65	6.4
681	Drug Stores	5	1.8	33	3.3
695	Gift and Craft Stores	25	8.8	79	7.8
699	Other	20	7.0	46	4.6
	Total Retail Sector	284	100.0	1009	100.0

Table 61. Chronological evolution of the retail sector, Fort McMurray, 1963 to 1978.

SIC	Retail Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
631	Food and Related Stores	1	ND	5	5	6	7	9	9	9	10	11	12	12	15	18	25
642	Major Department Stores	1	ND	1	1	2	2	2	2	2	2	2	2	2	2	2	2
650	Automotive (All Types)	1	ND	5	6	8	12	9	11	11	11	17	20	23	19	26	30
660	Clothing Stores	2	ND	4	5	8	12	10	10	11	12	12	11	13	18	23	33
673	Sporting Goods Stores	0	ND	1	1	0	0	0	0	1	2	2	2	3	4	5	7
673	Hardware and Building Supplies	1	ND	3	3	4	5	5	4	4	4	6	7	10	10	10	13
675	Mobile Home Sales and Service	0	ND	0	1	0	0	0	0	1	4	4	2	2	1	4	2
676	Furniture and Appliances	0	ND	2	3	4	4	3	2	3	4	5	3	5	7	12	17
678	Appliance Service and Repair	0	ND	1	1	1	2	2	2	4	4	6	7	7	8	8	12
681	Drug Stores	1	ND	2	2	2	2	2	2	2	2	2	2	2	2	4	4
695	Gift and Craft Stores	0	ND	1	1	2	3	4	3	4	4	3	6	7	8	12	21
699	Other	0	ND	0	1	1	1	1	0	0	0	3	4	5	6	10	14
	Total Retail Sector	7	ND	25	30	38	50	47	45	52	59	73	78	91	100	134	180

Table 62. Selected chronological ratios of retail sector, Fort McMurray.

SIC	Retail Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
631	Food and Related Stores	0.57	3.5	0.27	0.28
642	Major Department Stores	1.00	13.5	0.41	0.15
650	Automotive (All Types)	0.55	3.8	0.25	0.27
660	Clothing Stores	0.62	3.5	0.28	0.30
673	Sporting Goods Stores	0.78	3.1	0.07	0.43
673	Hardware and Building Supplies	0.76	5.2	0.28	0.26
675	Mobile Home Sales and Service	0.25	2.6	0.05	0.29
676	Furniture and Appliances	0.61	2.6	0.24	0.39
678	Appliance Service and Repair	0.67	3.6	0.14	0.31
681	Drug Stores	0.80	6.6	0.39	0.24
695	Gift and Craft Stores	0.84	3.2	0.18	0.42
699	Other	0.70	2.3	0.09	0.52
	All Retail Sub-Sectors	0.63	3.6	0.24	0.31
	All Sectors	0.60	3.2	0.20	0.33

Table 63. Number of enterprises and appearances in the finance, insurance and real estate sector, Fort McMurray.

SIC	Finance, Insurance and Real Estate Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
701	Banks	6	11.3	58	26.2
703	Other Credit Agencies	6	11.3	11	5.0
721	General Insurance Agencies	20	37.7	62	28.1
721	Life Insurance Companies	7	13.2	28	12.7
737	Real Estate Agencies	14	26.4	62	28.1
	Total Finance, Insurance and Real Estate Sector	53	100.0	221	100.0

Table 64. Chronological evolution of the finance, insurance and real estate sector, Fort McMurray, 1963 to 1978.

SIC	Finance, Insurance and Real Estate Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
701	Banks	1	ND	2	3	3	3	4	4	4	4	4	4	5	5	6	6
703	Other Credit Agencies	0	ND	0	0	0	1	0	0	0	0	1	0	0	3	3	3
721	General Insurance Agencies	0	ND	2	1	2	1	1	2	2	3	6	6	7	7	11	11
721	Life Insurance Companies	0	ND	0	0	0	1	2	2	2	2	2	4	2	3	5	3
737	Real Estate Agencies	0	ND	0	1	1	2	2	2	2	4	4	7	8	7	11	11
	Total Finance, Insurance and Real Estate Sector	1	ND	4	5	6	8	9	10	10	13	17	21	22	25	36	34

Table 65. Selected chronological ratios of finance, insurance and real estate sector, Fort McMurray.

SIC	Finance, Insurance and Real Estate Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
701	Banks	1.00	9.7	0.34	0.21
703	Other Credit Agencies	0.50	1.8	0.09	0.55
721	General Insurance Agencies	0.55	3.1	0.15	0.35
721	Life Insurance Companies	0.43	4.0	0.18	0.29
737	Real Estate Agencies	0.79	4.4	0.13	0.35
	All Finance, Insurance and Real Estate Sub-Sectors	0.64	5.1	0.19	0.32
	All Sectors	0.60	3.2	0.20	0.33

Table 66. Number of enterprises and appearances in the business management sector, Fort McMurray.

SIC	Business Management Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
855	Security and Investigations	3	5.3	5	3.3
861	Accountants	12	21.1	43	28.3
864-7	Consultants	32	56.1	79	52.0
869	Miscellaneous	10	17.5	25	16.4
	Total Business Management Sector	57	100.0	152	100.0

Table 67. Chronological evolution of business management sector, Fort McMurray, 1963 to 1978.

SIC	Business Management Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
855	Security and Investigation	0	ND	0	0	0	0	0	0	0	0	0	0	0	0	2	3
861	Accountants	0	ND	1	1	1	1	2	2	2	2	4	3	3	4	7	10
864-7	Consultants	0	ND	0	1	1	1	1	1	2	2	5	8	13	14	15	15
869	Miscellaneous	0	ND	0	0	0	0	0	0	0	1	3	2	7	5	3	4
	Total Business Management Sector	0	ND	1	2	2	2	3	3	4	5	12	13	23	23	27	32

Table 68. Selected chronological ratios of business management sector, Fort McMurray.

SIC	Business Management Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
855	Security and Investigations	1.00	1.7	0.00	1.00
861	Accountants	0.83	3.6	0.19	0.40
864-7	Consultants	0.47	2.5	0.06	0.38
869	Miscellaneous	0.40	2.5	0.00	0.28
	All Business Management Sub-Sectors	0.56	2.7	0.09	0.39
	All Sectors	0.60	3.2	0.20	0.33

Table 69. Number of enterprises and appearances in the personal services sector, Fort McMurray.

SIC	Personal Services Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
872	Barbers and Beauty Shops	22	34.4	105	49.3
874	Laundry and Dry Cleaning	8	12.5	35	16.4
840	Recreation Services	19	29.7	49	23.0
879	Other	15	23.4	24	11.3
	Total Personal Services Sector	64	100.0	213	100.0

Table 70. Chronological evolution of the personal services sector, Fort McMurray, 1963 to 1978.

SIC	Personal Services Sub-Sector	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
872	Barbers and Beauty Shops	0	ND	2	2	2	5	7	7	6	7	8	7	10	13	15	14
874	Laundry and Dry Cleaning	0	ND	2	2	2	2	2	2	2	2	2	2	3	2	4	6
840	Recreation Services	1	ND	2	2	1	1	1	1	1	1	1	2	5	7	8	15
879	Other	0	ND	0	0	0	0	0	0	0	1	1	0	2	3	5	12
	Total Personal Services Sector	1	ND	6	6	5	8	10	10	9	11	12	11	20	25	32	47

Table 71. Selected chronological ratios of personal services sector, Fort McMurray.

SIC	Personal Services Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
872	Barbers and Beauty Shops	0.64	4.8	0.24	0.28
874	Laundry and Dry Cleaning	0.75	4.4	0.34	0.29
840	Recreation Services	0.79	2.6	0.18	0.47
879	Other	0.80	1.6	0.00	0.71
	All Personal Services Sub-Sectors	0.73	3.3	0.22	0.37
	All Sectors	0.60	3.2	0.20	0.33

Table 72. Number of enterprises and appearances in the services to travellers sector, Fort McMurray.

SIC	Services to Travellers Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
881	Hotels and Motels	15	25.4	103	35.8
886	Restaurants	31	52.5	110	38.2
894	Car Rental Agencies	8	13.6	56	19.4
899	Travel Agencies	5	8.5	19	6.6
	Total Services to Travellers Sector	59	100.0	288	100.0

Table 73. Chronological evolution of the services to travellers sector, Fort McMurray, 1963 to 1978.

SIC	Services to Travellers Sub-Sectors	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
881	Hotels and Motels	1	ND	6	5	5	6	6	6	6	6	7	7	9	11	11	11
886	Restaurants	1	ND	4	4	6	5	4	5	5	7	7	8	8	10	14	22
894	Car Rental Agencies	0	ND	2	3	3	4	4	3	3	3	4	6	5	5	5	6
899	Travel Agencies	0	ND	1	1	1	1	1	1	1	1	1	1	2	2	2	3
	Total Services to Travellers Sector	2	ND	13	13	15	16	15	15	15	17	19	22	24	28	32	42

Table 74. Selected chronological ratios of services to travellers sector, Fort McMurray.

SIC	Services to Travellers Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
881	Hotels and Motels	0.73	6.9	0.34	0.21
886	Restaurants	0.71	3.5	0.26	0.33
894	Car Rental Agencies	0.75	7.0	0.34	0.20
899	Travel Agencies	0.60	3.8	0.32	0.26
	All Services to Travellers Sub-Sectors	0.71	4.9	0.31	0.26
	All Sectors	0.60	3.2	0.20	0.33

Table 75. Number of enterprises and appearances in the other enterprises sector, Fort McMurray.

SIC	Other Enterprises Sub-Sectors	Total Enterprises Through Period		Total Appearances Through Period	
		No.	%	No.	%
280	Printing and Publishing	8	8.6	19	10.2
898	Services to Houses and Buildings	40	43.0	78	41.9
	Unclassified Enterprises	45	48.4	89	47.9
	Total Other Enterprises Sector	93	100.0	186	100.0

Table 76. Chronological evolution of the other enterprises sector, Fort McMurray, 1963 to 1978.

SIC	Other Enterprises Sub-Sector	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
280	Printing and Publishing	0	ND	1	0	0	3	1	0	1	1	1	3	2	2	2	2
898	Services to Houses and Buildings	0	ND	0	0	0	1	2	2	2	3	2	3	7	9	14	33
	Unclassified	0	ND	2	0	1	1	1	0	1	3	9	15	20	15	14	7
	Total Other Enterprises Sector	0	ND	3	0	1	5	4	2	4	7	12	21	29	26	30	42

Table 77. Selected chronological ratios of other enterprises sector, Fort McMurray.

SIC	Other Enterprises Sub-Sectors	Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	Average Run of Appearances (Average Years in Operation)	Ratio of Pre-1971 Appearances to Total Appearances 1963-1978	Ratio of 1977, 1978 Appearances to Total Appearances 1963-1978
280	Printing and Publishing	0.25	2.4	0.26	0.21
898	Services to Homes and Buildings	0.83	2.0	0.06	0.60
	Unclassified Enterprises	0.16	2.0	0.06	0.24
	All Sectors	0.60	3.2	0.20	0.33

Table 78. Chronological evolution of all enterprises, Fort Chipewyan, 1963 to 1978.

Year	No. of Enterprises
1963	6
1964	ND
1965	6
1966	9
1967	11
1968	10
1969	11
1970	11
1971	11
1972	12
1973	14
1974	15
1975	16
1976	16
1977	17
1978	17
Total Appearances	182
Total Enterprises	34

Table 79. Selected chronological ratios of all enterprises, Fort Chipewyan.

Definition	Ratio
Ratio of 1978 Enterprises to Enterprises That Have Operated Over Period	0.50
Average Run of Appearances (Average Years in Operation)	5.4
Ratio of Pre-1971 Appearances to Total Appearances 1963 to 1978	0.35
Ratio of 1977, 1978 Appearances to Total Appearances 1963 to 1978	0.19

10.2 ANNOTATED BIBLIOGRAPHY

10.2.1 General Comments

An annotated bibliography of published and unpublished data sources relevant to an economic overview of the AOSERP area was prepared as a first step in carrying out this research assignment and is included in the following section of this report. The main purposes of the bibliography have been:

1. To identify sources of quantitative data that could be used as input into the preparation of the study; and,
2. To provide a data base from which gaps could be identified which could then be addressed in the later research stages.

The annotated bibliography which follows is not considered to be exhaustive. On-going work in the area of oil sands development is producing a constantly growing and updated body of knowledge and this particular bibliography has attempted to review current information to the extent it has become publicly available. There are unquestionably a number of unpublished or privately prepared reports that are not readily available and which are not included. Miscellaneous and sundry documents including newspaper clippings and correspondence have not been cited.

The following annotations are not designed to provide a comprehensive outline of the documents covered, but to briefly indicate those particular components which are considered relevant to a quantitative analysis of the AOSERP study area.

10.2.2 Bibliography of Relevant Literature

Abel-Gemini. 1976. Development of Rochers, red granite deposits at Fort Chipewyan, Alberta: Phase II. Prepared for the Government of Alberta. Department of Business Development and Tourism. Northern Development Branch and the Alberta Research Council. January, 1976.

This study of a proposed granite quarrying project at Fort Chipewyan includes some relevant data regarding local human resource characteristics such as population, labour force, education and skill levels.

Alberta Government Telephones. Northern district directory. 1963 to 1977.

Complete telephone listings are provided for Fort McMurray for the years 1963 to 1977, Fort MacKay for the years 1966 to 1977, Fort Chipewyan for 1963 to 1977, and Anzac for 1967 to 1977. These listings provide useful information for analyzing changes in the size and composition of the local business sector of the respective communities.

Alberta Native Development Corporation. 1975. Northeastern Alberta workforce survey.

The survey gives some account of the native labour force in northeastern Alberta and also provides statistics such as unemployment rates, education levels, and skill levels among native peoples. The results include comments with regard to the employment situation in Fort McMurray as the native people perceive it, training and employment desires, and the needs and aspirations of native communities. Relevant data for the communities of Anzac, Fort MacKay, Fort Chipewyan, and Fort McMurray are provided.

Bertram, R. 1977. Fort McMurray: office space forecast strategies and recommendations. Government of Alberta. Department of Housing and Public Works. Realty and Accommodation Division. Planning Branch. August, 1977.

This document includes an inventory of office space occupancy and employment by provincial government departments in Fort McMurray as well as projections of public service employment and related office space requirements to 1988.

Bureau of Statistics. Population of unincorporated places, Alberta, 1956, 1961, 1966, 1971, 1976. Government of Alberta. Treasury.

Based on federal census information, this tabulation provides historical population figures for unincorporated places in Alberta, including centres such as Anzac, Embarras, Fort MacKay, and Fort Chipewyan within the AOSERP study area.

Bureau of Statistics. Retail and service trade statistics. 1969-1972, 1973, 1974, 1975, 1976. Government of Alberta. Treasury.

These annual publications present retail and service trade statistics for different geographic groupings in Alberta, including Fort McMurray, Census Division No. 12, and Improvement District No. 18. The 1969-1972 document also contains some data relative to sub-areas within I.D. 18. Information includes number of outlets, employment, payroll and receipts for major groups within the retail and service trades.

Bureau of Statistics. Spatial price comparison surveys. 1974 to 1978. Government of Alberta. Treasury.

These annual surveys provide comparative price indexes for a number of food and non-food items in selected Alberta communities including Fort McMurray. Although the methodologies differ between surveys, the findings nonetheless provide some measure of relative price levels in Fort McMurray.

Canadian Bechtel Limited. 1974. Syncrude housing study and development program: Fort McMurray. January, 1974.

The report develops a housing program to meet the permanent employee housing requirements of the Syncrude project. It utilizes base year information (1972/73 data) regarding Fort McMurray housing composition, comparative housing costs, availability of community services and facilities, and Syncrude income levels.

Canadian Bechtel Limited and Syncrude Canada Limited. (unpublished). Manpower recruiting report: Mildred Lake Project. February, May, August 1976.

These reports review construction labour force requirements and local and national labour availability for the period 1975 to 1978. Native participation, training programs, and the recruitment process are discussed.

Canadian Institute for Research. in review. Native employment patterns in Alberta's Athabasca Oil Sands Region. Prepared for Alberta Oil Sands Environmental Research Program. Project HS 40.1.

This study of native employment patterns in Alberta's Athabasca Oil Sands Region includes the identification, review, and analysis of existing data. Information is derived from existing literature, interviews with key people in government, industry and training institutions, and file data of employers. From these sources, patterns and trends in native employment are identified, gaps and ambiguities about employment patterns and training programs are cited, and recommendations for further research are made.

Canadian Union of Public Employees. Local 1505 agreement. 1973 to 1978. Labour Relations Board.

Separate agreements between CUPE and two employers, the New Town of Fort McMurray and the Fort McMurray School District, include all articles governing relations between the employer and employees. Relevant information regarding wages, hours of work, and special allowances is given.

Chan, P. and J. Webb. 1975. Fort McMurray future housing needs study. Alberta Housing Corporation. Policy and Program Development. September 1975.

This report looks at the future housing needs of Fort McMurray given various projections for the Town's population growth. Housing supply and demand are studied, and it is concluded that affordability of housing rather than shortage of accommodation is a more immediate concern. Cost and composition figures, relevant to an overview of Fort McMurray, are available.

Cohos, Evamy and Partners. 1974. The New Town of Fort McMurray: revised general plan. June 1974.

This planning document was prepared in order to establish a framework which would enable physical development to occur in Fort McMurray in such a manner as to allow a strong urban structure to emerge and to meet the various needs of the people who would reside there. The report examines the anticipated growth of the town and formulates plans for accommodating future urban requirements. As a necessary precondition to that analysis, the report reviews the historical background and development of the community and the existing situation with respect to population, housing, industrial and commercial activity, and employment. Accordingly, the report contains useful benchmark information about the community for years prior to 1974.

Co-West Associates. 1976. Training follow-up study: Keyano College. Summary, conclusions, and recommendations. Module 14. June 1976.

This section of the study summarizes the previous 13 sections which included methodology, interview results, a look at the various programs Keyano College offers, and the relationship of these to the employer and community. Conclusions and recommendations which might enhance the role of the college in meeting changing community demands are given in the latter part of the report.

Co-West Associates. 1978. Social planning implications for health and social services: northeast Alberta region. Prepared for Northeast Alberta Regional Commission, Government of Alberta, Department of Social Services and Community Health and the Fort McMurray Regional Task Force. May 1978.

An examination of mobility in northeastern Alberta and a description of health and social services delivery therein provides a background to discussions of the implications for these services of continued population expansion in the region. The basic demographic and socio-demographic statistics used in the report to indicate mobility provide relevant information concerning such things as labour turnover, the history of Syncrude and local government employment, air traffic, and the availability of health care.

Department of Advanced Education and Manpower. 1976. Manpower implications of future developments in the Alberta oil sands. Government of Alberta. Department of Advanced Education and Manpower. Planning Secretariat. November 1976.

This paper identifies the manpower implications of possible developments in the Alberta oil sands over a 15-year time horizon. The potential impact upon the Alberta labour market is examined and the implications for educational and training programs are discussed in relationship to four alternative development scenarios. The paper includes an overview of the current (1976) status of oil sands developments which provides manpower data regarding GCOS and Syncrude operations.

Department of Business Development and Tourism. 1978a. Index of manufacturers in Alberta, 1977-78. Government of Alberta. September 1978.

This document provides an index of manufacturing firms in Alberta by products, size, and location. Relevant information for manufacturers in the AOSERP area may be obtained.

Department of Business Development and Tourism. 1978b. Fort McMurray community survey. Government of Alberta. October 1978.

This survey provides a summarized but generally comprehensive picture of present community characteristics including population, labour force, manufacturing employment,available government services, community facilities, financial institutions, trading and construction volume, and housing composition.

Department of Business Development and Tourism. Industry and resources, 1975 and 1978/79. Government of Alberta.

These publications outline the significant resources of Alberta and the records and economic development of recent years. The reports are designed primarily to provide information for the purposes of assessing production, market and investment opportunities, and also to provide up-to-date information on the economic and demographic make-up of the province. They contain useful background information on relevant geographic areas in northeast Alberta.

Department of Energy and Natural Resources. 1978. Unpublished data resulting from personal communication with department officials. Government of Alberta. Department of Energy and Natural Resources. Timber Management Branch. November 1978.

Information is provided regarding the history and location of commercial logging activities in the AOSERP area, historical commercial and non-commercial timber production within the Athabasca Forest by Forest Management Unit, lists of quota holders in relevant parts of the Athabasca Forest, historical timber production values, and a brief history and current list of sawmills operating in the AOSERP area.

Department of Federal and Intergovernmental Affairs. 1974. The Alberta oil sands story. Government of Alberta.

This paper, designed to inform Canadians about the oil sands, includes a description of the Alberta oil sands and the processes involved in extracting synthetic crude oil, a projection of manpower requirements, and a summary of some environmental implications of the development. Historical and future research needs are considered in projecting the timing and scope of further oil sands projects. Participation of Albertans through the Alberta Energy Company is discussed. Relevant data concerning population, labour force, and Alberta's ability to meet the employment needs of oil sands development are provided.

Department of Health and Welfare. 1975. Community profile: health data information system. Government of Canada. August, November, and December 1975.

This survey contains basic health and socio-economic data in 1975 for selected communities including Embarass Portage, Fort Chipewyan, Fort McMurray, and Anzac. The survey data covers community and student population, housing stock and conditions, community services, and employment activities.

Department of Housing and Public Works. 1978a. Fort McMurray housing survey: summary of findings. Government of Alberta. Department of Housing and Public Works. Policy and Planning Division. September 1978.

This report summarizes the findings of a housing survey carried out in Fort McMurray with responses from 2,300 of the 7000 questionnaires sent out. The survey concentrates on housing considerations such as size, type of house, tenure, housing prices, mortgage and utility requirements, housing satisfaction and preferences, but also includes findings relative to previous place of residence, residency status, employment distribution by sector, income distribution, and perceptions regarding community services and facilities.

Department of Housing and Public Works. 1978b. Alberta apartment vacancy and rental cost survey. Government of Alberta. Department of Housing and Public Works. Policy and Planning Division. Housing Registry. August 1978.

This report summarizes the results of a survey of apartment vacancies and rental rates taken in 83 Alberta cities and towns. Vacancy rates by type of dwelling unit and age of building, the number of units in a given municipality, and the range of rental costs are all provided. Fort McMurray is one of the municipalities surveyed.

Department of Housing and Public Works. 1978c. Alberta house cost comparison survey. Government of Alberta. Department of Housing and Public Works. Policy and Planning Division. September 1978.

This report presents the results of an Alberta house construction costs survey. The findings with regard to labour and materials costs by subtrade are then compared as between several Alberta communities including Fort McMurray.

Department of Industry and Development. Alberta industry and resources: principal manufacturing statistics (1964, 1968, 1970, 1971-73, 1973, 1974, 1975). Government of Alberta.

These statistical documents provide information regarding the manufacturing sector in Census Division 12 and for geographic sub-regions within that division. For the years surveyed, relevant information includes numbers of manufacturing establishments, employment, value-added and value of shipments.

Department of Industry and Resources. 1965. Fort McMurray survey. Government of Alberta.

This survey of Fort McMurray was published in 1965 during the early stages of the oil sands developmental phase. The report provides useful benchmark information about the community at that time, including freight and passenger movements, business establishments, housing and accommodation, building permits, and municipal services.

Department of Industry and Tourism. 1970. Merchandise trade data: 1963-1968. Government of Alberta.

The report contains annual retail trade information for various geographic regions including Census Division 12 and sub-regional districts within the census division. Service trade data are available by census division.

Department of Municipal Affairs. 1972. New Town of Fort McMurray general plan. Government of Alberta. Department of Municipal Affairs. Provincial Planning Branch.

This plan describes the form and manner in which the development of Fort McMurray over the period 1970 to 1980 might best be carried out. The report is divided into two parts: (1) survey and analysis; and (2) proposals, programming, and implementation. Part 1 contains relevant economic base data for the community for the years prior to 1971.

Department of Municipal Affairs. 1978. Report on existing and projected commercial space. Government of Alberta. Department of Municipal Affairs. Fort McMurray Planning Team. November 1978.

This report has collected data on commercial floor space existing and under construction in Fort McMurray and compares these figures with General Plan projections. The report also contains comparisons of retail factors with other communities, draws some approximate standards for retail development, and projects anticipated gross leasable areas for food and department store type merchandise.

Department of Municipal Affairs. New Town of Fort McMurray: municipal census. 1975, 1976, 1977, 1978. Government of Alberta.

These census documents include a considerable amount of demographic information covering Fort McMurray, such as residency status, population by age, sex, and family composition, dwelling types by community location, housing vacancy rates, tenancy status and, of particular usefulness in understanding the economic development of the local area, labour force data by Standard Industrial Classification, occupation, and place of employment.

Department of National Revenue. Taxation statistics for taxation years 1960-1976. Government of Canada. Department of National Revenue. Taxation Division.

These tabulations provide income data for various population agglomerations in Alberta including Census Division 12, and since 1967 for specific communities or community groupings within the census division. The analyses include number, average and total income of taxable and non-taxable returns.

Department of Recreation, Parks and Wildlife. 1976. Commercial fisheries catch statistics for Alberta, 1942-1975. Government of Alberta.

The report provides data regarding commercial fishing activity in Alberta by lake. Poundage of catch by species and number of licences issued for the 1942-1975 period are given.

Dominion Bureau of Statistics. Building permits: annual summaries. 1961-1977. Government of Canada.

These annual summaries present information regarding the number of building permits issued by dwelling type, and the estimated value of residential, industrial, commercial, and institutional construction by economic region and municipality.

Dominion Bureau of Statistics. Census of Canada, 1961. Government of Canada.

The census provides 1961 data for Census Division 12 and to a more limited extent for communities and enumeration areas within Census Division 12 covering the following: population, housing characteristics and tenure, labour force by occupation and industry division, retail and service trade, family income, and agriculture activity.

Dominion Bureau of Statistics. Census of Canada, 1966. Government of Canada.

The census provides 1966 data for Census Division 12, and to a lesser extent for sub-regions and communities within the census division, with regard to population, household and dwelling characteristics, retail and service trade, and agriculture activity.

Dominion Bureau of Statistics. Census of Canada, 1971. Government of Canada.

The census provides 1971 data for Census Division 12, Fort McMurray, and enumeration areas covering the following: population, labour force by occupation, employment status and industry division, household and family incomes, dwelling characteristics by type and tenure, retail and service trade.

Dominion Bureau of Statistics. Census of Canada, 1976. Government of Canada.

The census provides 1976 data for Census Division 12, Improvement District 18, and for enumeration areas within the improvement district covering the following: population by five-year age groups and sex, family characteristics, dwelling characteristics by type and tenure, labour force activity, and family and household incomes.

Dominion Bureau of Statistics. Manufacturing industries of Canada: geographical distribution, 1961-1964, 1966, 1970-1974. Government of Canada.

Collections of statistical data regarding manufacturing activities for census divisions, economic regions, and municipalities. Relevant inclusions are number of establishments by industry group, size of establishments, employment and value added.

Edey, D. 1974. Fort McMurray housing needs study. Alberta Housing Corporation. August 1974.

The study assesses housing demand in Fort McMurray for the period 1974 to 1976. It includes the results of a survey of employers and expected future employers in the Town to develop information regarding local employment by sector, income levels, and housing demand by type of accommodation. The report also examines housing supply considerations and prevailing costs of housing.

Ekistic Design Consultants Limited. 1974. Northeast Alberta regional plan: traplines and the social consequences of development. November 1974.

The report assesses the social consequences of economic development in northeastern Alberta on the trapping industry and includes information regarding the present economic importance of trapping, such as estimates of the industry employment and income levels.

Ekistic Design Consultants Limited. 1975a. An examination of urban growth alternatives in the northeast Alberta region. April 1975: revised May 1975.

The study involves the examination of regional urban growth requirements in two phases: the first phase consists of an analysis of regional growth alternatives and concludes that a second urban centre within the Northeast Alberta Region would best serve the requirements of foreseeable industrial development; the second phase involves an analysis to select an appropriate location for the required urban centre. It contains relevant but summarized base data regarding the existing economic structure of the region and its communities.

Ekistic Design Consultants Limited. 1975b. Northeast Alberta regional plan: a review of timber management within the northeast Alberta region. May 1975.

This document presents an inventory of forestry resources in the Athabasca Forest of northeastern Alberta, summarizes the status of forestry activity, and develops projections and recommendations relative to the future development of the forest sector of the northeast region. It contains useful information regarding the locations and level of forestry production in the region.

Ekistic Design Consultants Limited. 1975c. Northeast Alberta regional plan: a working document on agricultural development and the northeast Alberta regional plan. July 1975.

The document provides a synopsis of the history of agriculture in northeastern Alberta, an analysis of the region's ability to sustain agriculture, a description of the existing agricultural development, and an evaluation of the future economic potential of this industry. Some relevant quantitative information with regard to existing agricultural activity is included.

Ekistic Design Consultants Limited. 1975d. Northeast Alberta regional plan: Fort Chipewyan sub-region profile. July 1975.

This profile provides a comprehensive description of the Fort Chipewyan sub-region, which is taken to include the communities of Fort Smith, Uranium City, Eldorado, and Camsell Portage, in addition to Fort Chipewyan, and examines the economic potential and development alternatives for the region. The sections of the report that review the socio-economic characteristics of the Fort Chipewyan area (based largely on 1971 census data) and the existing structure of the community are particularly relevant to an historical economic analysis of the oil sands region.

Ekistic Design Consultants Limited. 1975e. Northeast Alberta regional plan: Anzac, a community profile. October 1975.

The report contains a history of Anzac and the surrounding area, examines the physical and socio-economic features of the community, including some of the local problems, and briefly identifies some development alternatives for the future. Some pertinent data regarding local employment and business activities are given.

Ekistic Design Consultants Limited. 1975f. Northeast Alberta regional plan: a working document on population projections for the northeast Alberta region. December 1975.

This document includes population projections for the urban and native communities of the northeast Alberta region and discusses methodologies and assumptions. It provides some relevant analysis of the present population characteristics of the communities in the region.

Ekistic Design Consultants Limited. 1976. A preliminary regional plan for northeast Alberta. March 1976.

The plan contains an analysis of the basic factors which will influence development of the northeast region, recommends a regional development pattern toward which development should be guided, and suggests means of achieving the proposed pattern. Summary descriptions and role analyses of communities, including their socio-economic characteristics, are given. Some basic information relating to activity in various economic sectors of the region, such as service industries, fishing, trapping, tourism, and public services is included.

Energy Resources Conservation Board. 1977. Alberta oil and gas industry annual statistics. ERCB Report 78-17.

This compilation of statistics includes historical information for the years 1968 to 1977 regarding Alberta production and disposition of oil, gas, propane, butane, and sulphur, as well as drilling activity. Synthetic crude oil production and sulphur production at oil sands plants is segregated.

Fort McMurray Chamber of Commerce. Fort McMurray community profile, 1973 and 1974.

These documents present a general profile of Fort McMurray with information regarding municipal population, facilities, housing, local business, and community and industrial development.

Fox, R.I. and W.J. Lockhart. 1973. Population and labour force forecasts by area: northern Alberta, 1971-1981. Government of Canada. Department of Manpower and Immigration. Economic Analysis and Forecast Branch (Edmonton).

The report contains forecasts of population and labour force for six separate functional areas in northern Alberta, including the Fort Chipewyan and Fort McMurray areas. It draws on information from the 1971 Statistics Canada census, the Department of Indian Affairs and Northern Development, the Metis Association of Alberta, and the Metis Rehabilitation Branch of the Alberta Department of Health and Social Development to desegretate the 1971 population into Treaty Indians, Registered Metis, and "other" categories, and develops separate forecasts for each of these three components.

Gillespie, B. 1977. Comparative employment report: Fort McMurray. Government of Alberta. Department of Municipal Affairs. May 1977.

Using the 1976 Fort McMurray municipal census and the 1971 federal census, the report compares by Standard Industrial Classification the existing composition of Fort McMurray's employment base with that of nine other selected communities. The document then forecasts and discusses the anticipated employment profile of Fort McMurray when the community matures.

Harries, Hu & Associates Ltd. 1975. The impact of the Syncrude project on the economy of Alberta. January 1975.

This study assesses the impact of the Syncrude project on the economy of Alberta and in one section looks specifically at the impact of the project on Fort McMurray. It contains historical information regarding basic employment, building permits, population, housing units, and retail sales for a few years prior to 1975. GCOS employment figures for 1968 to 1973 and Syncrude manpower requirements for 1974 are given. Some background information is attainable from the results of a January, 1975 household and business survey of Fort McMurray.

Hydrocarb Consultants Ltd. 1975. Industrial development study. Prepared for Ekistic Design Consultants Limited. February 1975.

The study discusses the implications of oil sands development in the northeast region, including such aspects as recovery techniques, plant locations, employment construction, and operating production. Relevant information is given for both the construction and operational phases with regard to numbers and profile of the labour force, transportation requirements, estimates of materials and supplies by tonnage and product/by-product volumes.

IBI Group. 1976a. Fort McMurray overview. Prepared for Northward Developments Ltd. February 1976.

The study examines the progress which has been made in the community of Fort McMurray toward the provision of housing, public facilities, and commercial facilities appropriate to its projected population. The report highlights areas where facilities supply appears to be lagging and recommends activities to correct these problems. A 1975/76 inventory of housing and commercial facilities in the Town is given.

IBI Group. 1976b. Study of retail/commercial/services space in Fort McMurray. Prepared for Northward Developments Ltd. May, 1976.

Based upon an examination of existing and proposed retail/commercial/services space in Fort McMurray and a study of the nature, size, and projected growth of the community, the report provides estimates of present and forecast space shortages to 1980. The report includes results of a 1976 survey of retail/commercial/service space in the town, providing names, addresses, and square footages of businesses and services by major classification.

IBI Group. 1977. Fort McMurray office space potential. Prepared for FML Development Corporation Limited. July 1977.

The report assesses the demand for additional office space in Fort McMurray, with particular reference to requirements for professional and corporate offices. Included are the results of a July 1977 survey of office space in the town, which identifies local office space by tenant, location, and square footage.

Jones, Murray V., and Associates Ltd. 1978. Anzac. May, 1978.

This report formulates a community plan for the hamlet of Anzac. The report examines the location and regional setting of Anzac, reviews demographic statistics, engineering services and alternatives, and develops a detailed community plan. A section outlining the results of a local opinion survey provides some useful socio-economic information about the community.

Larson, L.E. 1977. The impact of resource development on individual and family well-being. Prepared for Alberta Oil Sands Environmental Research Program. Human Environment Committee. February, 1977.

The report examines the social implications of resource development in northern Alberta, addressing particularly the issues of mobility and family impact. It contains a relevant review of existing demographic information, including family size and growth rates, labour force profile, and housing facilities. A summary of the problems and satisfactions with life in Fort McMurray is also given.

Mackenzie, K.C., Associates Limited. 1977. Fort Chipewyan community plan. July 1977.

This document reviews the historical development of Fort Chipewyan and formulates a planning framework which would satisfy the future requirements of the community. The report includes some useful socio-economic data related to local employment and commercial activities.

Moncrieff, Montgomery and Associates Ltd. 1971. A socio-economic study of Fort Chipewyan, the Peace Athabasca Delta and the Lake Athabasca region. December 1971.

This study formulates a 10-year socio-economic development plan and implementation program for the Lake Athabasca and Peace-Athabasca Delta areas, which encompass Fort Chipewyan. The report compiles a considerable amount of base information (circa 1970) regarding population characteristics and the economy of the area, including population, employment, individual and sector income, education, community services, and comparative price levels.

New Town of Fort McMurray. 1978a. Licensed businesses operating in the New Town of Fort McMurray. October 1978.

This document provides a complete listing of licenced businesses operating in the community, with the business name, address, and telephone number. The businesses are indexed and categorized by type of business.

New Town of Fort McMurray. 1978b. Unpublished listing of town businesses. New Town of Fort McMurray. Planning Team.

A compilation as of Fall 1978, of all major employers in the Town of Fort McMurray by location and Standard Industrial Classification code.

New Town of Fort McMurray. (unpublished) Register of business licenses issued, January, 1973 to October, 1978.

The registers list by name and location all businesses having obtained operating licences in Fort McMurray for the years 1973 to 1978.

New Town of Fort McMurray. Annual report. 1976, 1977.

These annual reports review the development and progress of the New Town of Fort McMurray and discuss various departmental activities. Some informative data regarding such things as the growth in municipal staff, staff turnover, volume of building permits, and number of business licences issued is given.

New Town of Fort McMurray. Quarterly report: housing and population count. 1977, 1978. New Town of Fort McMurray. Planning Team.

These reports, published every three months, provide data on housing supply by housing type in Fort McMurray and each of its development areas. Included is information regarding vacant sites, units under construction, and units completed -- whether occupied or unoccupied.

Nicholls, J.H. and R.W. Luhning. 1977. Heavy oil in situ pilot plants in Alberta (past and present). Alberta Oil Sands Technology Research Authority.

This paper reviews the historical development and current status of in situ pilot plants in Alberta, including the Athabasca oil sands area. The paper provides the operator name and location of these projects and offers information such as development costs, construction, start-up and operating dates, and production output.

Northeast Alberta Regional Commission. 1976. Northeast Alberta regional plan: information base. November 1976.

This two-part report summarizes the regional information base (part 1) and presents policy recommendations for regional plan formulation and action recommendations to resolve some of the immediate problems evident in the region (part 2). A section of the report concerned with the existing regional structure provides useful background information regarding settlements in the region, current economic activities, and public services.

Patel, K. 1976. Fort Chipewyan: hotel development opportunity. Government of Alberta. Department of Business Development and Tourism. Business Services Branch. August 1976.

This study of the potential for hotel development in Fort Chipewyan provides general background information about the community with regard to population, ethnic composition, employment and income levels, sources of income, and availability of service facilities.

Reid, Crowther and Partners Limited. 1973. The impact of a proposed synthetic crude oil project on Fort McMurray. Prepared for Syncrude Canada Ltd. February 1973.

The report assesses the anticipated impact to the Town of Fort McMurray of the Syncrude oil sands development, particularly in terms of the requirement for housing, commercial and educational facilities. Some useful 1971/72 baseline information about the community, such as housing prices and rental rates, is given.

Renewable Resources Consulting Services Ltd. 1975. Northeast Alberta regional plan: furbearers. February 1975.

This report examines the fur industry in northeastern Alberta and, through an analysis of trapline records for the period 1970 to 1974, develops estimates of the annual number and value of furbearer species trapped in the region.

Resource Management Consultants (Alberta) Ltd. 1978. Impact of resource development on population in selected northern Alberta centres and its effect on government accommodation. Prepared for Government of Alberta. Department of Housing and Public Works. April 1978.

This report examines the impact of major resource development projects over the next decade in relation to three study areas: (1) Cold Lake-St. Paul; (2) Wabasca-Slave Lake; and (3) Peace River District. The report includes population forecasts and an analysis of economic impact resulting from construction and operating phases, and it identifies provincial government departments likely to be impacted by the developments. In examining resource development generally, the report draws on some experience from Fort McMurray; also, because historical reporting units for the Cold Lake area sometimes overlap the AOSERP study region, some relevant information regarding the economic base of Fort McMurray and surrounding area is included.

Ross, P.S. and Partners, and McNeal, Hildebrand and Associates Limited. 1976. Northern Alberta transportation study. Prepared for the Government of Alberta. Department of Transportation. Volumes I and II.

This study includes an examination of the various transportation systems within northern Alberta or linking it with surrounding areas outside the province, identifies transport deficiencies, and evaluates facility improvements. It provides pertinent origin-destination traffic data for the various transportation modes operating in northern Alberta. Some base and historical data regarding oil sands and forest products activity in the Athabasca oil sands region is given.

Stanley Associates Engineering Ltd. 1975a. Northeast Alberta regional plan: inventory of existing transportation systems. Transportation working document No. 5. Prepared for Ekistic Design Consultants Limited. March 1975.

The main purpose of this document was to catalogue and describe the existing transportation infrastructure in or contiguous to and serving the northeast Alberta region, and assess its capacity relative to the volume of traffic (both freight and passenger) being handled. The report covers the following transportation modes: waterways, railways, highways, and airways. The data contained in the report concerning historical and present flows of goods are particularly relevant to an economic overview of the region.

Stanley Associates Engineering Ltd. 1975b. Northeast Alberta regional plan: an overview of energy, utilities and their relationship to oil sands plant operation. Utilities working document No. 1. Prepared for Ekistic Design Consultants Limited. July 1975.

This document presents an inventory of energy utility sources, transmission, and utilization in the northeast Alberta region, shows how this utility situation has developed, and predicts the effects on utility requirements of further oil sands development in the region. Some relevant information regarding the northeastern Alberta import-export energy flows and balances is included.

Stanley Associates Engineering Limited. 1975c. Northeast Alberta regional plan: projection of transportation demand for the northeast Alberta region. Transportation working document No. 9. Prepared for Ekistic Design Consultants Limited. October 1975.

This document provides a statement of project transportation demands, in terms of inter- and intra-regional movement of goods and people, for the northeast Alberta region over a 25-year period from 1976 to 2000. It includes estimates of freight movement requirements for the GCOS operation, for urban infrastructure construction, for urban supply, and for future oil sands projects in both the construction and operating phases. Estimates of people movement, including journey-to-work travel, local intercity travel, and interregional travel, are made.

Stanley Associates Engineering Limited. 1976. Northeast Alberta regional plan: transportation network development pattern for the maximum economic development hypothesis. Transportation working document No. 18. Prepared for Northeast Alberta Regional Commission. December 1976.

This document examines the regional implications in terms of projected transportation demands and future transportation system development associated with a rapid economic development pattern in northeastern Alberta. It contains useful economic information regarding the present movement of goods and people in the region, as well as descriptive information regarding the existing transportation infrastructure network.

Syncrude Canada Ltd. 1978. Unpublished demographic data. May, August 1978.

This data encompassing the Syncrude employee population in Fort McMurray, provides an employment profile by age, sex, marital status, number of dependents, and income.

Todd, A. 1976. Analysis of fur production records for registered traplines in the AOSERP area, 1970-1975. Government of Alberta. Department of Recreation, Parks and Wildlife. Fish and Wildlife Division. May 1976.

This analysis of fur production provides data on number and size of traplines and gives mean annual values for production in the 1970 to 1975 time period, in an attempt to estimate the economic value of trapping in the AOSERP study area.

Van Dyke, E.W. 1978. Lives in transition: the Fort MacKay case. Prepared for the Northeast Alberta Regional Commission by Applied Research Associates Ltd. July 1978.

This study was carried out to assess the problems and needs of Fort MacKay, which has been experiencing encroachment by resource development, and it is based largely on observations and field research techniques. Those parts of the report dealing with existing services and facilities in the community and the economic base, including consumption and employment patterns, and business activity, are useful sources of information for an economic overview of the larger oil sands region.

Van Dyke, E.W., and C. Loberg. 1978. Community studies: Fort McMurray, Anzac, Fort MacKay. Prepared for the Alberta Oil Sands Environmental Research Program by Applied Research Associates Ltd. AOSERP Report 37.

These studies, descriptive in nature, develop insights into the social and human problems related to resource development in the Athabasca Oil Sands region. The interviewed sample of 43 Fort McMurray residents provides information regarding motive for settling in the oil sands region, satisfactions and dissatisfactions with quality of life, including educational facilities, retail outlets, social and health service delivery, and entertainment opportunities. Briefer sections on Fort MacKay and Anzac provide similar information for those communities. Some relevant references are made to socio-economic characteristics.

11. AOSERP RESEARCH REPORTS

1.		AOSERP First Annual Report, 1975
2.	AF 4.1.1	Walleye and Goldeye Fisheries Investigations in the Peace-Athabasca Delta--1975
3.	HE 1.1.1	Structure of a Traditional Baseline Data System
4.	VE 2.2	A Preliminary Vegetation Survey of the Alberta Oil Sands Environmental Research Program Study Area
5.	HY 3.1	The Evaluation of Wastewaters from an Oil Sand Extraction Plant
6.		Housing for the North--The Stackwall System
7.	AF 3.1.1	A Synopsis of the Physical and Biological Limnology and Fisheries Programs whithin the Alberta Oil Sands Area
8.	AF 1.2.1	The Impact of Saline Waters upon Freshwater Biota (A Literature Review and Bibliography)
9.	ME 3.3	Preliminary Investigations into the Magnitude of Fog Occurrence and Associated Problems in the Oil Sands Area
10.	HE 2.1	Development of a Research Design Related to Archaeological Studies in the Athabasca Oil Sands Area
11.	AF 2.2.1	Life Cycles of Some Common Aquatic Insects of the Athabasca River, Alberta
12.	ME 1.7	Very High Resolution Meteorological Satellite Study of Oil Sands Weather: "A Feasibility Study"
13.	ME 2.3.1	Plume Dispersion Measurements from an Oil Sands Extraction Plant, March 1976
14.		
15.	ME 3.4	A Climatology of Low Level Air Trajectories in the Alberta Oil Sands Area
16.	ME 1.6	The Feasibility of a Weather Radar near Fort McMurray, Alberta
17.	AF 2.1.1	A Survey of Baseline Levels of Contaminants in Aquatic Biota of the AOSERP Study Area
18.	HY 1.1	Interim Compilation of Stream Gauging Data to December 1976 for the Alberta Oil Sands Environmental Research Program
19.	ME 4.1	Calculations of Annual Averaged Sulphur Dioxide Concentrations at Ground Level in the AOSERP Study Area
20.	HY 3.1.1	Characterization of Organic Constituents in Waters and Wastewaters of the Athabasca Oil Sands Mining Area
21.		AOSERP Second Annual Report, 1976-77
22.	HE 2.3	Maximization of Technical Training and Involvement of Area Manpower
23.	AF 1.1.2	Acute Lethality of Mine Depressurization Water on Trout Perch and Rainbow Trout
24.	ME 4.2.1	Air System Winter Field Study in the AOSERP Study Area, February 1977.
25.	ME 3.5.1	Review of Pollutant Transformation Processes Relevant to the Alberta Oil Sands Area

26.	AF 4.5.1	Interim Report on an Intensive Study of the Fish Fauna of the Muskeg River Watershed of Northeastern Alberta
27.	ME 1.5.1	Meteorology and Air Quality Winter Field Study in the AOSERP Study Area, March 1976
28.	VE 2.1	Interim Report on a Soils Inventory in the Athabasca Oil Sands Area
29.	ME 2.2	An Inventory System for Atmospheric Emissions in the AOSERP Study Area
30.	ME 2.1	Ambient Air Quality in the AOSERP Study Area, 1977
31.	VE 2.3	Ecological Habitat Mapping of the AOSERP Study Area: Phase I
32.		AOSERP Third Annual Report, 1977-78
33.	TF 1.2	Relationships Between Habitats, Forages, and Carrying Capacity of Moose Range in northern Alberta. Part I: Moose Preferences for Habitat Strata and Forages.
34.	HY 2.4	Heavy Metals in Bottom Sediments of the Mainstem Athabasca River System in the AOSERP Study Area
35.	AF 4.9.1	The Effects of Sedimentation on the Aquatic Biota
36.	AF 4.8.1	Fall Fisheries Investigations in the Athabasca and Clearwater Rivers Upstream of Fort McMurray: Volume I
37.	HE 2.2.2	Community Studies: Fort McMurray, Anzac, Fort MacKay
38.	VE 7.1.1	Techniques for the Control of Small Mammals: A Review
39.	ME 1.0	The Climatology of the Alberta Oil Sands Environmental Research Program Study Area
40.	WS 3.3	Mixing Characteristics of the Athabasca River below Fort McMurray - Winter Conditions
41.	AF 3.5.1	Acute and Chronic Toxicity of Vanadium to Fish
42.	TF 1.1.4	Analysis of Fur Production Records for Registered Traplines in the AOSERP Study Area, 1970-75
43.	TF 6.1	A Socioeconomic Evaluation of the Recreational Fish and Wildlife Resources in Alberta, with Particular Reference to the AOSERP Study Area. Volume I: Summary and Conclusions
44.	VE 3.1	Interim Report on Symptomology and Threshold Levels of Air Pollutant Injury to Vegetation, 1975 to 1978
45.	VE 3.3	Interim Report on Physiology and Mechanisms of Air-Borne Pollutant Injury to Vegetation, 1975 to 1978
46.	VE 3.4	Interim Report on Ecological Benchmarking and Biomonitoring for Detection of Air-Borne Pollutant Effects on Vegetation and Soils, 1975 to 1978.
47.	TF 1.1.1	A Visibility Bias Model for Aerial Surveys for Moose on the AOSERP Study Area
48.	HG 1.1	Interim Report on a Hydrogeological Investigation of the Muskeg River Basin, Alberta
49.	WS 1.3.3	The Ecology of Macrobenthic Invertebrate Communities in Hartley Creek, Northeastern Alberta
50.	ME 3.6	Literature Review on Pollution Deposition Processes
51.	HY 1.3	Interim Compilation of 1976 Suspended Sediment Date in the AOSERP Study Area
52.	ME 2.3.2	Plume Dispersion Measurements from an Oil Sands Extraction Plan, June 1977

53.	HY 3.1.2	Baseline States of Organic Constituents in the Athabasca River System Upstream of Fort McMurray
54.	WS 2.3	A Preliminary Study of Chemical and Microbial Characteristics of the Athabasca River in the Athabasca Oil Sands Area of Northeastern Alberta
55.	HY 2.6	Microbial Populations in the Athabasca River
56.	AF 3.2.1	The Acute Toxicity of Saline Groundwater and of Vanadium to Fish and Aquatic Invertebrates
57.	LS 2.3.1	Ecological Habitat Mapping of the AOSERP Study Area (Supplement): Phase I
58.	AF 2.0.2	Interim Report on Ecological Studies on the Lower Trophic Levels of Muskeg Rivers Within the Alberta Oil Sands Environmental Research Program Study Area
59.	TF 3.1	Semi-Aquatic Mammals: Annotated Bibliography
60.	WS 1.1.1	Synthesis of Surface Water Hydrology
61.	AF 4.5.2	An Intensive Study of the Fish Fauna of the Steepbank River Watershed of Northeastern Alberta
62.	TF 5.1	Amphibians and Reptiles in the AOSERP Study Area
63.		An Overview Assessment of <u>In Situ</u> Development in the Athabasca Deposit
64.	LS 21.6.1	A Review of the Baseline Data Relevant to the Impacts of Oil Sands Development on Large Mammals in the AOSERP Study Area
65.	LS 21.6.2	A Review of the Baseline Data Relevant to the Impacts of Oil Sands Development on Black Bears in the AOSERP Study Area
66.	AS 4.3.2	An Assessment of the Models LIRAQ and ADPIC for Application to the Athabasca Oil Sands Area
67.	WS 1.3.2	Aquatic Biological Investigations of the Muskeg River Watershed
68.	AS 1.5.3 AS 3.5.2	Air System Summer Field Study in the AOSERP Study Area, June 1977
69.	HS 40.1	Native Employment Patterns in Alberta's Athabasca Oil Sands Region
70.	LS 28.1.2	An Interim Report on the Insectivorous Animals in the AOSERP Study Area
71.	HY 2.2	Lake Acidification Potential in the Alberta Oil Sands Environmental Research Program Study Area
72.	LS 7.1.2	The Ecology of Five Major Species of Small Mammals in the AOSERP Study Area: A Review
73.	LS 23.2	Distribution, Abundance and Habitat Associations of Beavers, Muskrats, Mink and River Otters in the AOSERP Study Area, Northeastern Alberta
-	--	Interim Report to 1978
74.	AS 4.5	Air Quality Modelling and User Needs
75.	LS 2.1	Interim Report on the Soils Inventory of the AOSERP Study Area

76. AF 4.5.1 An Intensive Study of the Fish Fauna of the Muskeg River Watershed of Northeastern Alberta

These reports are not available upon request. For further information about availability and location of depositories, please contact:

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