WORKING PAPER

MINING INDUSTRY EMPLOYMENT FORECAST
MANITOBA
1971 - 1981

ECONOMIC ANALYSIS BRANCH
PLANNING DIVISION

REGIONAL ECONOMIC EXPANSION CANADA
EXPANSION ÉCONOMIQUE RÉGIONALE CANADA

WORKING PAPER

MINING INDUSTRY EMPLOYMENT FORECAST MANITOBA 1971 - 1981

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MANITOBA MINING INDUSTRY EMPLOYMENT FORECAST 1971 to 1981

I. FORECAST PROCEDURE

This paper contains employment forecasts for the mining industry in Manitoba for the period 1971-81. It is based upon employment forecasts that have been made for each company that was in production in 1970, for companies that have announced their intentions to bring mines into production and for "significant mineral deposits" that may be brought into production. Individual company forecasts are contained in a data bank that has been created in the Economic Analysis Branch. The data bank is used for continuous analysis of the Canadian mining industry.

Data are obtained from a wide range of sources These include company reports and statements, provincial and federal government reports, personal contacts and press articles. The reliability of the information varies but it can be used with confidence because data problems generally occur in respect of the smaller and less significant companies.

The definition of the mining industry in this report corresponds to that of Statistics Canada as used in Division 4 - Mines (including Milling), Quarries and Oil Wells. Thus, the forecasts can be used in conjunction with data from Statistics Canada.

Employment forecasts are presented in three categories, namely upper, realistic and lower. These reflect a range of employment levels that may occur if different combinations of economic and marketing factors come into play. Aggregate mining industry group employment figures have been derived, and are shown in Tables 3, 4 and 5 as well as in Figure 1.

Each of the major mineral industry groups is briefly reviewed in this report. Forecasts have also been aggregated by Census Division in order to show those areas where mining industry activity is expected to change. These figures are shown in Table 6. Figure 2 shows a map of Census Divisions in Manitoba where mining activity occurs.

No specific method has been employed in making the employment forecasts for individual mines. However, a wide range of current and historical information has been consulted and used, and those factors of greatest significance have been given their appropriate weighting. Thus, for a very large low grade open pit copper mine, the metal price will be a

critical factor concerning its viability, whereas for a small high grade underground silver mine, the maintenance of adequate ore reserves is frequently the critical factor. The man-year employment forecasts shown here provide one uniform method of presenting the expectations that result from an analysis of each mine.

Seasonal changes of employment in the mineral industry occur frequently. The fluctuations within the year can be substantial. Therefore,all employment figures shown in this report are in terms of man-years of paid employment per year. Thus, due to seasonal fluctuations of the work force, the employment shown in this report will be less than the peak employment experienced during the year.

As in all forecasts, the possibility of unforeseen events affecting the figures increases over time. For the most part, considerable confidence can be placed in the forecast to 1976 because company intentions are generally indicated and sometimes specified for up to five years in the future. Beyond 1976, the forecasts become increasingly judgemental. Consequently, they should be viewed with caution for this latter period.

In making the forecasts a number of important assumptions have been made. These are listed below:-

(a) That both Federal and Provincial legislation concerning taxation, royalties, land tenure,etc. remains constant throughout the forecast period with the exception of already announced changes. These changes have been taken into account.

(b) That the supplies of labour, capital and materials to the industry in terms of price and availability will be adequate throughout the forecast period.

(c) That the markets for minerals will not change dramatically in terms of volume, relative price and location throughout the forecast period, and

(d) That end-use substitution between different minerals or between minerals and other non-mineral products is not great throughout the forecast period.

It should be noted that all forecasts have been made by the same person, and that where possible they have been reviewed by specialists in the minerals sector. By this means, it is to be hoped that large errors have been eliminated and that any bias in the forecasts will be small and consistent.

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II. SUMMARY OF MINING INDUSTRY EMPLOYMENT IN MANITOBA, 1971-81

Employment in the Manitoba mining industry is forecast to increase until the middle of the decade as a number of new developments reach the production stage. Thereafter, mining employment will decline when some operations close as a result of resource depletion. However, the employment gains will exceed the losses, and a net gain in mining employment of about 1,000 is forecast for the decade. Total mining employment is realistically forecast to increase from just over 6,000 to just over 7,000, although the upper forecast suggests that employment could be as much as 8,400 in 1981. The lower forecast indicates that mining employment will rise moderately in the decade.

The metallic mineral sector completely dominates mining industry activity in Manitoba, and is concentrated in four northern locations, namely Thompson, Flin Flon, Snow Lake and Lynn Lake. Of the mineral commodities produced, nickel and copper are by far the most important in terms of value. The Manitoba mineral industry is therefore somewhat vulnerable to fluctuating metal prices for nickel and copper. However, other evidence indicates that employment in the mining industry will not be seriously affected by price changes.

A considerable strength that will contribute significantly towards stability in the Manitoba mineral industry in the future is the fact that the metallic mineral resource base is strong in terms of exploitable reserves. Also, the metallic sector of the industry rests almost entirely in the hands of four major companies whose financial, managerial and technical resources appear to be adequate to deal with future requirements in the mining sector.

Table 7 and Figure 3 at the end of this paper have been included to indicate the names of companies involved in mining activity and the location of active mines and development prospects in 1970.

III. THE MANITOBA MINING INDUSTRY IN 1970

The value of minerals produced by the Manitoba mining industry in 1970 rose to $333.3 million from $246.3 million in 1969, thus registering a 35.3 per cent gain. Almost all of this increase was caused by increases in the value of production of nickel and copper which were responsible for 81.7 per cent of the total value of minerals produced in Manitoba.

Metallic minerals generated 88.1 per cent of the total value of mineral production in 1970 compared to 83.8 per cent in 1969. The contribution of the non-metallic sector declined from 1.3 per cent in 1969 to 0.7 per cent in 1970 of the total value of mineral production, and the dollar value also fell. Likewise, the structural sector also showed an absolute fall in production value and relatively declined from 8.6 per cent in 1969 to 6.3 per cent of the total value of mineral products in 1970. The contribution of the fuels sector fell from 6.3 per cent in 1969 to 4.9 per cent in 1970 but recorded a small gain in the absolute value of production.

The most important mineral commodities produced in Manitoba and their value in 1968, 1969 and 1970 are shown in Table I on the following page.

TABLE 1

VALUE OF MAJOR MINERAL COMMODITIES PRODUCED

IN MANITOBA 1968 TO 1970

Year / Commodities	1968	1969	1970 (p)
	($ million)		
Nickel	118	148	213
Copper	32	38	60
Petroleum Crude	16	16	16
Zinc	13	15	13
Cement	12	13	10
Sand and Gravel	6	5	7
Stone	3	2	3

(p): preliminary

Source: Department of Energy, Mines and Resources

TABLE 2

MINING INDUSTRY EMPLOYMENT IN MANITOBA *

1961-1981

Year	Past Mining Employment	Forecast Mining Employment
1961	3,306	
1962	4,021	
1963	4,415	
1964	4,452	
1965	4,448	
1966	4,475	
1967	4,988	
1968	5,229	
1969	6,077	
1970	NA	
1971		6,055
1972		6,785
1973		7,495
1974		7,540
1975		7,560
1976		7,640
1977		7,055
1978		7,080
1979		7,025
1980		7,050
1981		7,075

NA - Not Available

* All employment figures are shown in man-years of paid employment

IV. MINING INDUSTRY EMPLOYMENT FORECASTS BY COMMODITY GROUP

In this chapter, the realistic employment forecasts are analysed for each major sector of the mining industry. In Tables 3, 4 and 5, that follow, the upper, realistic and lower forecasts by commodity group are summarized. The tabulations are followed by a series of more detailed descriptions of each mineral commodity group. Table 2 on the previous page shows total past employment and the realistic total forecast of mining employment.

At the start of each commodity group summary, a sub-table is included that indicates the realistic employment forecast for that group and its relative importance as an employer in the mining sector. The sub-tables have been derived by taking the realistic commodity group forecast from Table 4.

TABLE 3

MANITOBA MINERALS EMPLOYMENT FORECAST *

1971-1981

UPPER ESTIMATE

Commodity Group	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Metallic minerals	6,000	7,010	7,750	7,780	7,780	7,980	8,180	7,530	7,530	7,430	7,430
Non-metallic minerals	100	100	100	100	100	110	110	110	110	110	110
Structural materials	250	250	250	260	260	260	260	270	270	270	270
Fuels	70	70	70	70	60	60	60	60	60	60	60
Other services	40	40	40	40	40	40	40	40	40	40	40
Contingency	-	50	100	150	200	250	300	350	400	450	500
TOTAL	6,460	7,520	8,310	8,400	8,440	8,700	8,950	8,360	8,410	8,360	8,410

* All employment figures are shown in man-years of paid employment

TABLE 4

MANITOBA MINERALS EMPLOYMENT FORECAST *

1971-1981

REALISTIC ESTIMATE

Commodity Group	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Metallic minerals	5,640	6,370	7,040	7,060	7,060	7,110	6,510	6,510	6,430	6,430	6,430
Non-metallic minerals	85	85	85	85	85	95	95	95	95	95	95
Structural materials	240	240	240	240	240	230	230	230	230	230	230
Fuels	60	60	50	50	50	50	40	40	40	40	40
Other services	30	30	30	30	30	30	30	30	30	30	30
Contingency	-	-	50	75	100	125	150	175	200	225	250
TOTAL	6,055	6,785	7,495	7,540	7,565	7,640	7,055	7,080	7,025	7,050	7,075

* All employment figures are shown in man-years of paid employment

TABLE 5

MANITOBA MINERALS EMPLOYMENT FORECAST *

1971-1981

LOWER ESTIMATE

Commodity Group	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Metallic minerals	5,270	5,780	5,950	6,510	6,065	6,005	5,895	5,945	5,945	5,945	5,945
Non-metallic minerals	60	60	60	60	60	65	65	65	65	65	65
Structural materials	230	230	230	230	230	230	230	230	220	220	220
Fuels	50	50	50	40	40	40	40	40	30	30	30
Other services	20	20	20	20	20	20	20	20	20	20	20
Contingency	-	-	-	50	50	75	75	100	100	125	125
TOTAL	5,630	6,140	6,310	6,910	6,465	6,435	6,325	6,400	6,380	6,405	6,405

* All employment figures are shown in man-years of paid employment

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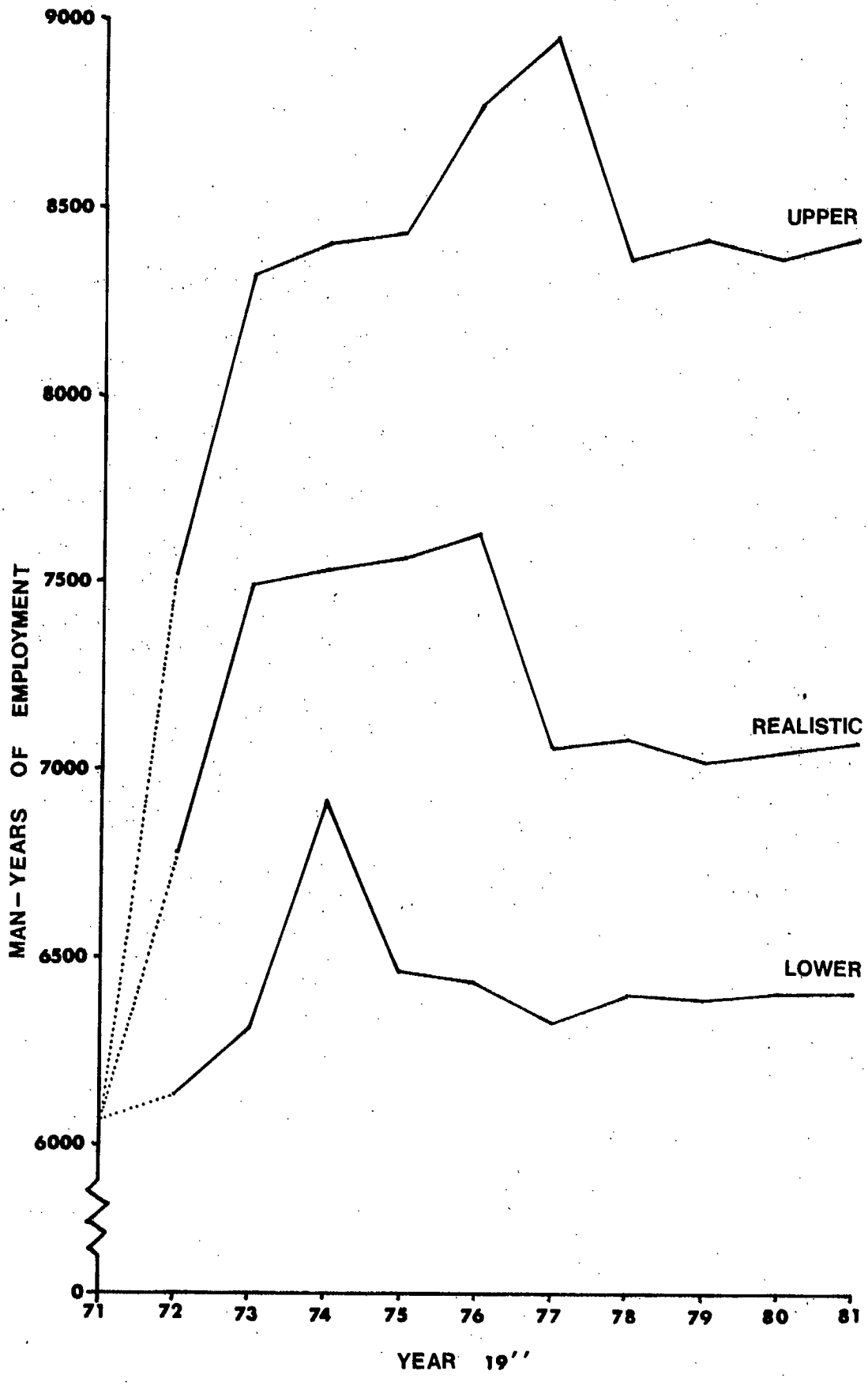
FIGURE I

PERMANENT MINING INDUSTRY EMPLOYMENT FORECASTS 1971 – 1981



(a) Metallic Minerals

Metallic mineral production accounts for the majority of mining industry employment in Manitoba.

Realistic Forecast of Employment	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
No. of employees	5,640	6,370	7,040	7,060	7,060	7,110	6,510	6,510	6,430	6,430	6,430
% of forecast total	94	94	94	94	93	93	92	92	92	91	91

Nickel-copper mining at Thompson and at Lynn Lake, and copper-zinc mining at Snow Lake and Flin Flon account for the bulk of metallic mineral production and employment in Manitoba. Important metallic by-products are gold, silver and cobalt. Tantalum mining at Bernic Lake makes a small but increasingly important contribution to metallic mineral production in the province.

The large nickel mining and smelting complex at Thompson has developed rapidly since the Thompson mine opened in 1960. Forecasts for the 1970's indicate that a relatively strong demand for nickel will be experienced and thus, employment in nickel mining will continue to increase. However, it should also be noted that the nickel mines at Thompson are only a part of the operations of the International Nickel Company of Canada Ltd., contributing under 40 per cent of the company's total nickel production in 1970. It is thus possible for the company to switch emphasis between its

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Ontario and Manitoba operations, particularly at times when surplus production capacity is present.

The copper-zinc operations of Hudson Bay Mining and Smelting Co. Ltd. at Snow Lake and Flin Flon and those of Sherritt Gordon Mines Ltd. at Fox Lake and Ruttan Lake (opening 1973) are forecast to continue to provide employment at present or increased levels in the 1970's. The Sherritt Gordon nickel mine at Lynn Lake is also forecast to remain in production through the decade. The new Manibridge nickel mine operated by Falconbridge Nickel Mines Ltd. is forecast to be in production through the forecast period. However, the small mining operations of Dumbarton Mines are forecast to close in 1976.

In the metallic sector, the Bernic Lake Mine of Tantalum Mining Corporation of Canada Ltd. is a relatively new operation, and is Canada's sole producer of tantalum. In addition, the mine has considerable reserves of lithium and cesium, the commercial production of which will generate some additional mining employment in the 1970's.

(b) Non-metallic Minerals

Non-metallic mineral production is confined to the southern parts of the province and does not contribute significantly to mining employment in Manitoba.

Realistic Forecast of Employment	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
No. of employees	85	85	85	85	85	95	95	95	95	95	95
% of forecast total	1	1	1	1	1	1	1	1	1	1	1

Gypsum, bentonite, silica and salt are produced at five relatively small operations. An increase in both the volume and value of production is forecast for each of these operations. However, there will be very little increase in employment. It is anticipated that increased operating efficiency at these mines will be capable of satisfying increased demand in the future. At the present time no new producers are expected to bring mines on stream in the non-metallic minerals sector during the decade.

(c) Structural Materials

Employment in the structural materials sector is forecast to decline marginally during the 1970's as a result of increased operating efficiency.

Realistic Forecast of Employment	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
No. of employees	240	240	240	240	240	230	230	230	230	230	230
% of forecast total	4	4	3	3	3	3	3	3	3	3	3

Activity in this sector of the mineral industry is mainly determined by the demands of the provincial construction industry. The major commodities in this group are, sand, gravel, stone and cement. None of these operations is sufficiently large to be individually included in the company forecasts.

Sand, gravel and stone operations exist at various strategic points in the Province. The majority of employment in structural materials mining is not reported by Statistics Canada under mining activity but appears under construction industry employment. For this reason, it is estimated that perhaps 250 man-years of employment are not reported in the mining sector for Manitoba.

(d) Fuels

The decline in employment in the fuels sector is forecast to continue in the 1970's.

Realistic Forecast of Employment	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
No. of employees	60	60	50	50	50	50	40	40	40	40	40
% of forecast total	1	1	1	1	1	1	1	1	1	1	1

Crude petroleum is the only fuel produced in Manitoba, coming from oil fields in the Virden area. The low point of oil production in Manitoba was experienced in 1963 and since then a considerable increase in production has resulted from the successful implementation of secondary recovery techniques in established fields. However, new oil fields have not been discovered in Manitoba and the rate of exploration drilling has fallen to very low levels. The employment forecast shows the anticipated decline in the importance of crude oil production in Manitoba in the 1970's.

Oil and gas exploration in Hudson Bay could lead to new employment opportunities if commercial resources are discovered. Present evidence indicates that production will not occur before the end of the forecast period even if a commercial discovery is made early in the decade.

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(e) Other Mineral Industry Activity

Realistic Forecast of Employment	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
No. of employees	30	30	80	105	130	155	180	205	230	255	280
% of forecast total	-	-	1	1	2	2	3	3	3	4	4

This sector is composed of the "Other Services" and the "Contingency" groups. The other services to the mineral industry include items such as contract drilling, but this grouping is very small. The contingency grouping is intended to account for developments that cannot be specifically forecast, and yet can be anticipated to occur in the Province. Any increase in the "Other Services" group is accounted for in the "Contingency" group.

V. MINING INDUSTRY EMPLOYMENT FORECASTS BY CENSUS DIVISION

While it is useful to have employment forecasts on a provincial or on a commodity group basis, many planning functions require a more detailed disaggregation of mining industry employment in order to evaluate the impact of that employment on a specific area. Figure 2 shows the Census Divisions in Manitoba. A breakdown of the upper, realistic and lower employment forecasts by Census Division is shown in Table 6. Figure 2 also shows the realistic forecast of mining industry employment in diagrammatic form. It is not possible to disaggregate some of the industry sectors such as sand and gravel that are characterized by a number of small operators. These have been included in the "Other" groupings, which also contains "Fuels", "Other Services" and the "Contingency".

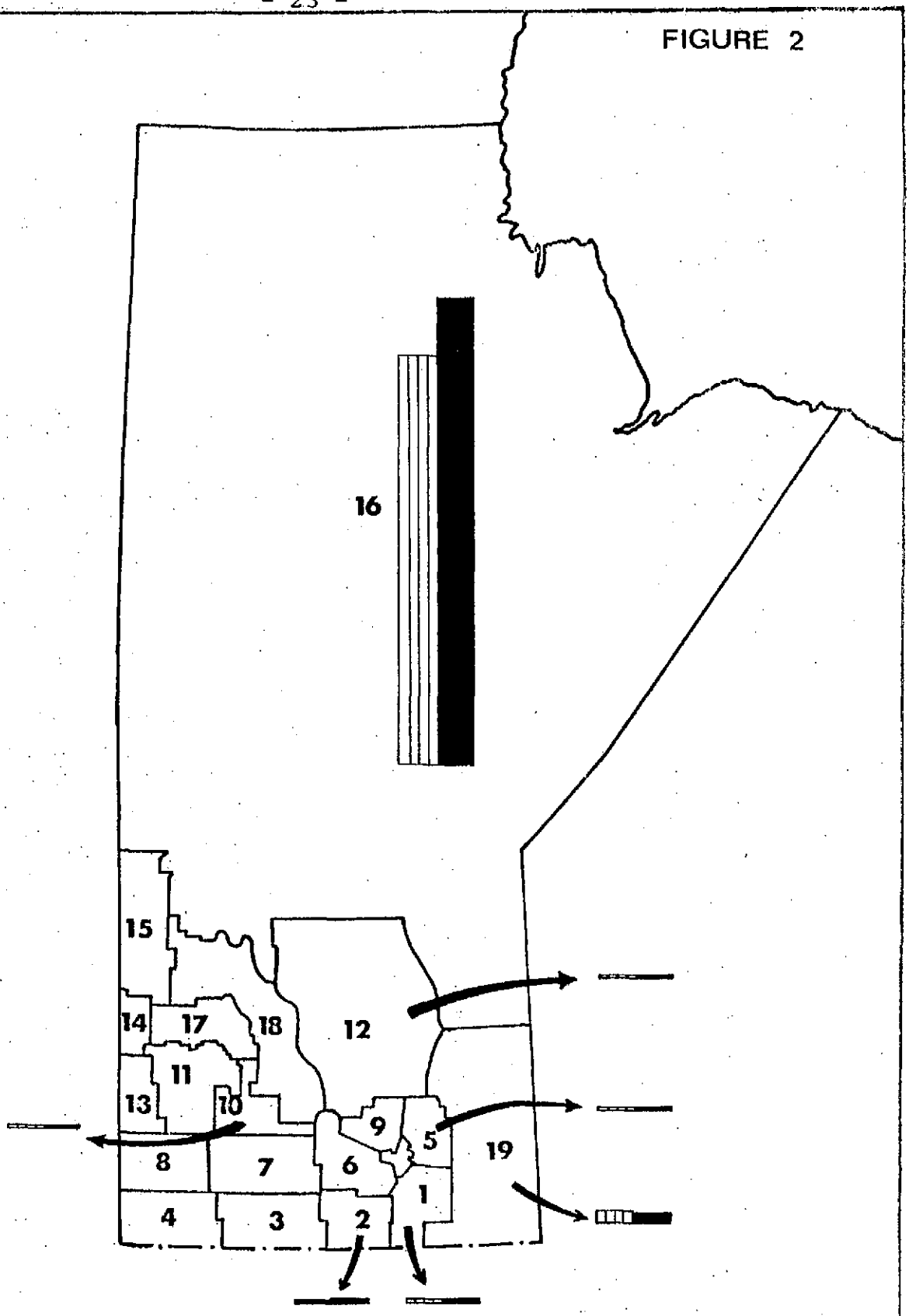
It is quite clear from the data shown in Table 6 and Figure 2 that Census Division 16 which covers perhaps two thirds of the province also contains over 90 per cent of mining industry employment. In this context, all other areas are relatively unimportant, but in fact the mining industry does provide important local employment in six other Census Divisions and particularly in Census Division 19.

Within Census Division 16 there are three distinct mining areas, namely the nickel belt centred on Thompson, the Snow Lake - Flin Flon base metal mining area and the Lynn Lake area. There will be some shift in the levels of employment within this Census Division. The percentage distribution of mining employment in Census Division 16 for the years 1970 and 1981 is shown below.

Area	1970	1981
Lynn Lake	18%	22%
Thompson	38%	46%
Snow Lake/Flin Flon	44%	32%
Census Division 16	100%	100%

Based upon present evidence there will be continued growth in the Thompson and Lynn Lake areas and a decline in the Snow Lake/Flin Flon area in the 1970s.

FIGURE 2



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Mining Employment by Census Division 1971 & 81

TABLE 6

FORECAST PERMANENT MINING INDUSTRY EMPLOYMENT*
IN MANITOBA 1971-1981
BY CENSUS DIVISION

Census Division	Estimate Class**	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	U	30	30	30	30	30	30	30	30	30	30	30
01	R	25	25	25	25	25	25	25	25	25	25	25
	L	15	15	15	15	15	15	15	15	15	15	15
	U	10	10	10	10	10	20	20	20	20	20	20
02	R	10	10	10	10	10	20	20	20	20	20	20
	L	5	5	5	5	5	10	10	10	10	10	10
	U	15	15	15	15	15	15	15	15	15	15	15
05	R	10	10	10	10	10	10	10	10	10	10	10
	L	10	10	10	10	10	10	10	10	10	10	10
	U	20	20	20	20	20	20	20	20	20	20	20
10	R	15	15	15	15	15	15	15	15	15	15	15
	L	10	10	10	10	10	10	10	10	10	10	10
	U	5	5	5	5	5	5	5	5	5	5	5
12	R	5	5	5	5	5	5	5	5	5	5	5
	L	5	5	5	5	5	5	5	5	5	5	5
	U	5,870	6,880	7,610	7,610	7,610	7,810	8,010	7,410	7,410	7,310	7,310
16	R	5,520	6,250	6,920	6,920	6,920	6,970	6,410	6,410	6,330	6,330	6,330
	L	5,160	5,670	5,840	6,400	5,990	5,930	5,820	5,870	5,870	5,870	5,870
	U	150	150	160	190	190	190	190	140	140	140	140
19	R	140	140	140	160	160	160	120	120	120	120	120
	L	125	125	125	125	90	90	90	90	90	90	90
	U	6,100	7,110	7,850	7,880	7,880	8,090	8,290	7,640	7,640	7,540	7,540
SUB-TOTAL	R	5,725	6,455	7,125	7,145	7,145	7,205	6,605	6,605	6,525	6,525	6,525
	L	5,330	5,840	6,010	6,570	6,125	6,070	5,960	6,010	6,010	6,010	6,010

(Cont'd)

TABLE 6 (Cont'd)

Census Division	Estimate Class**	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	U	360	410	460	520	560	680	660	720	770	820	870
OTHER ***	R	330	330	370	395	420	435	450	475	500	525	550
	L	300	300	300	340	340	365	365	390	370	395	395
	U	6,460	7,520	8,310	8,400	8,440	8,770	8,950	8,360	8,410	8,360	8,410
TOTAL	R	6,055	6,785	7,495	7,540	7,565	7,640	7,055	7,080	7,025	7,050	7,075
	L	5,630	6,140	6,310	6,910	6,464	6,435	6,325	6,400	6,380	6,405	6,405

* All employment figures are shown in man-years of paid employment.

** The identifying letters U, R and L stand for Upper, Realistic and Lower Estimates respectively.

*** The "other" classification shown here contains commodity groups that are province wide and cannot be split by census division. This also contains the "contingency" grouping.

APPENDIX A

Company Names, Locations and Commodities
Produced in Manitoba 1970

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TABLE 7

COMPANY NAMES, LOCATIONS AND COMMODITIES MINED IN MANITOBA 1970

Map Reference	Company Name	Property Name	Mineral(s)	Latitude	Longitude
				o '	o '
(1)	Western Gypsum Ltd.	Silver Plains Mine	Gypsum	49 27	97 16
(2)	Pembina Mountain Clays Ltd.	Morden Mine	Bentonite	49 17	98 18
(3)	The Winnipeg Supply & Fuel Co. Ltd.	Selkirk Plant	Silica	50 10	96 50
(4)	Canadian Salt Co. Ltd.	Neepawa Operation	Salt	50 15	99 30
(5)	Domtar Construction Materials Ltd.	Gypsumville Quarry	Gypsum	51 47	98 38
(6)	Sherritt Gordon Mines Ltd.	Fox Mine	Copper	56 38	101 38
(7)	Sherritt Gordon Mines Ltd.	Ruttan Mine*	Copper/Zinc	56 29	99 38
(8)	Sherritt Gordon Mines Ltd.	Lynn Lake Mine	Nickel/Copper	56 31	101 02
(9)	Bowden Lake Nickel Mines Ltd.	Bucko & Bowden Properties*	Nickel	54 53	98 39
(10)	International Nickel Co. of Canada	Thompson Mine	Nickel/Copper	55 43	97 51
(11)	International Nickel Co. of Canada	Birchtree Mine	Nickel/Copper	55 43	97 59
(12)	International Nickel Co. of Canada	Pipe Mine*	Nickel/Copper	55 29	98 08
(13)	International Nickel Co. of Canada	Soab Mine*	Nickel/Copper	55 14	98 25
(14)	Falconbridge Nickel Mines Ltd.	Manibridge Mine	Nickel/Copper	54 54	98 40
(15)	Hudson Bay M & S Co. Ltd.	Anderson Lake Mine	Copper	54 51	100 01
(16)	Hudson Bay M & S Co. Ltd.	Flin Flon (Man) Mine	Copper/Zinc	54 46	101 53
(17)	Hudson Bay M & S Co. Ltd.	Schist Lake Mine	Copper/Zinc	54 43	101 49
(18)	Hudson Bay M & S Co. Ltd.	Stall Lake Mine	Copper/Zinc	54 52	99 56

(Cont'd)

TABLE 7 (Cont'd)

Map Reference	Company Name	Property Name	Mineral(s)	Latitude	Longitude
				o '	o '
(19)	Hudson Bay M & S Co. Ltd.	Osborne Lake Mine	Copper/Zinc	54 58	99 43
(20)	Hudson Bay M & S Co. Ltd.	Dickstone Mine	Copper/Zinc	54 51	100 30
(21)	Hudson Bay M & S Co. Ltd.	White Lake Mine*	Copper/Zinc	54 42	101 44
(22)	Hudson Bay M & S Co. Ltd.	Centennial Mine*	Copper/Zinc	54 42	101 41
(23)	Hudson Bay M & S Co. Ltd.	Chisel Lake Mine	Zinc/Copper	54 50	100 08
(24)	Hudson Bay M & S Co. Ltd.	Ghost Lake Mine*	Copper/Zinc	54 50	100 06
(25)	Tantalum Mining Corp.	Bernic Lake Mine	Tantalum	50 26	95 28
(26)	Dumbarton Mines Ltd.	Dumbarton Mine	Nickel/Copper	50 28	95 26
(27)	The Winnipeg Supply and Fuel Co.Ltd.	Selkirk Silica Div.	Silica	51 15	96 15

* Not in production in 1970

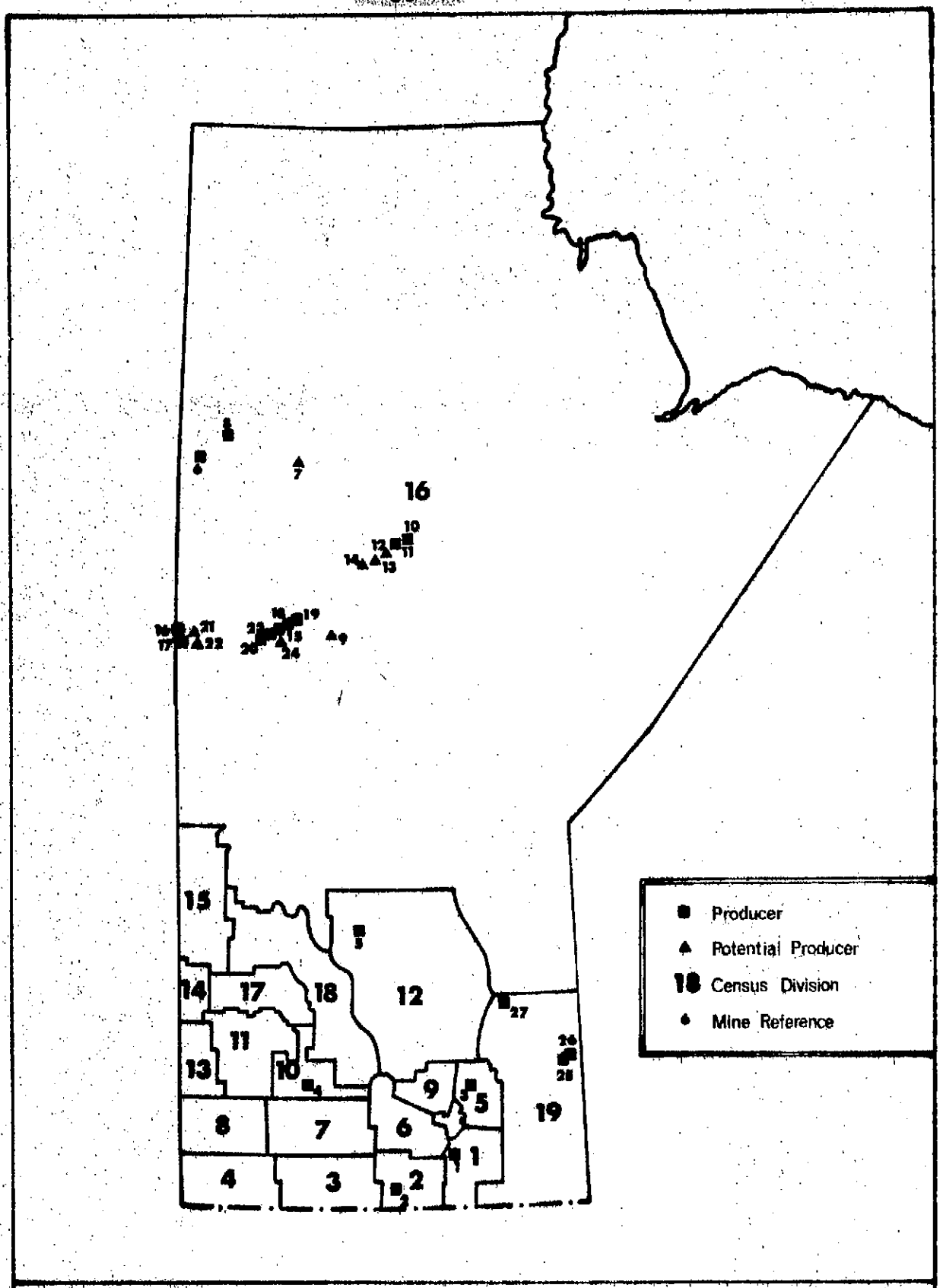

FIGURE 3

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MINE LOCATIONS