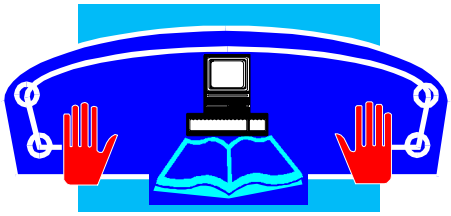


Delta Employment Development Ii - An Assessment Of The Effect Of The Construction And Operation Of Gas Processing Plants

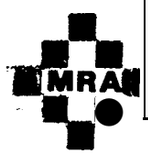
Type of Study: Analysis/review

Mining/oil/energy, Nwt Gas Industry

Date of Report: 1981

Author: Manforce Research Associates

Catalogue Number: 6-2-12



MANFORCE RESEARCH ASSOCIATES

DELTA EMPLOYMENT DEVELOPMENT II

AN ASSESSMENT OF THE EFFECT OF THE CONSTRUCTION AND OPERATION ...)

MANPOWER SPECIALISTS — INFORMATION SYSTEMS

DELTA EMPLOYMENT DEVELOPMENT II

AN ASSESSMENT OF THE EFFECT OF THE CONSTRUCTION AND OPERATION OF GAS PROCESSING PLANTS AND RELATED DEVELOPMENT ON THE EMPLOYMENT SITUATION OF THE MACKENZIE DELTA REGION OF THE NORTHWEST TERRITORIES

MANFORCE RESEARCH ASSOCIATES

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SECTION I

OVERVIEW

1. OVERVIEW

A. INTRODUCTION

The purpose of this study is to assess the impact of hydrocarbon industry activities on the employment situation in the Mackenzie Delta.[1] The hydrocarbon industry activities of concern are i) the construction, operation, and maintenance of the proposed Mackenzie Delta Gas Processing Plants; ii") the operation of the proposed Mackenzie Valley Gas Pipeline; and iii) exploration, seismic, and field development activities in the Delta region. The manpower requirements for these areas of concern are presented in Figures l, 2, 3, and 4 following. Figures 5 and 6 illustrate the timing of gas plant construction, operation, and maintenance.

In order to account for the present uncertainty of construction schedules we have dealt with activity rather than calendar years. It is possible that construction of the pipeline and gas plants could start in 1977 but a much more likely date is 1978. Figures used for exploration, seismic, and field development cover the period 1975 (Year 1) to 1995 (Year 21) while gas plant construction is slated to start in Year 3. If construction does not start until]978 the activity year to be used would be Year 4.

[1] Mackenzie Delta includes the communities of Aklavik, Tuktoyaktuk, Inuvik, Fort McPherson, Fort Franklin, Norman Wells, Sachs Harbour, Paulatuk, Arctic Red River, Colville Lake, Fort Norman, and Fort Good Hope.

B. DEVELOPMENT SCENARIOS

In order to separate the effects of differing activity levels on the Delta employment situation, we have proceeded to analyse positions with respect to differing development scenarios or alternatives. To provide the upper and lower boundaries we have defined a LOW IMPACT and a NO HYDROCARBON case. Also, calculations have been made in order to allow presentation of the components of the LOW IMPACT case attributable to i) the construction and operation of the gas processing plants; and ii) the operation of the gas pipeline and continuing exploration, seismic, and field development work, referred to as GAS PLANT and OTHER HYDROCARBON activity respectively.

The specifications of each scenario are outlined as follows.

1. Low Impact

All employment for the gas processing plants and attendant facilities to be located at the plant site (Camp), except for ten positions in Administration/Account ing/Expediting which are to be located in Inuvik.

2. Net Impact of Gas Processing Plants

That proportion of the total impact found under the LOW IMPACT case which is attributable to the construction and operation of the Mackenzie Delta Gas Processing Plants.

3. Net Impact of Other Hydrocarbon

That proportion of the total impact found under the LOW IMPACT case which is attributable to the operation of the Mackenzie Valley Gas Pipeline and activity in exploration, seismic, and field development considered within the boundaries of the Delta area.

4. No Hydrocarbon

That level of activity which would be expected for the concern area if there were to be no hydrocarbon industry activity.

Under these conditions it becomes a simple matter to identify the effect of each situation on the total, and as well to look at these positions in terms of overall effect. Thus, the LOW IMPACT case illustrates the expected positions given that development proceeds as the Proponents have suggested. The other three cases separate the effect of each activity and when summed, equal the LOW IMPACT position.

c. DATA SOURCES

All of the information regarding labour force numbers by the various disaggregations was provided by the Territorial Employment Record and Information System (TERIS). Growth rates for all non-hydrocarbon industries were provided by the Department of Economic Development, Government of the Northwest Territories and population forecasts, used to calculate TERIS coverage rates, were provided by the Regional Planning Section,

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FIGURE 1

MANPOWER REQUIREMENTS
CONSTRUCTION OF MACKENZIE DELTA
GAS PROCESSING PLANTS AND ATTENDANT FACILITIES

OCCUPATION	ACTIVITY					
Supervisor	8	2	4	6	2	7
Foreman	8	2	2	3	1	17
Welder		10	4	15	12	
Pipefitter	4		4	15	3	.53-.
Pile Driver			2	10	8	
Electrician		4		6		44
Mechanic	30					
Instrumentation				6		
Boiler Maker						15
Brick Layer						4
Millwright						5
Concrete Finisher						11
Operator						25
Pa inter						13
Teamster						13
Carpenter			4			34
Insulator					3	11
Sheet Metal Worker						4
Iron Worker						27
Crane Operator			2	11		
Cat Operator	20				3	
Truck Driver	302	10			2	
Cook	4		2	6		
Camp Attendant	8		4	6		
Labourer	6	20	14	30	12	37
TOTAL	390	48	42	114	46	320

1-Gravel Hauling
2-Airstrip and Hangar
3-Dock and Staging Area
4-Cluster Facilities
S-Gathering Lines
6-Gas Plants

Source: Response to Request for Socio-Economic Supplementary Concerns - Assumptions Related to Socio-Economic Concerns of Mackenzie Delta Gas Development System; Imperial, Gulf, and Shell Oil, 1975.

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FIGURE 2

MANPOWER REQUIREMENTS
OPERATION AND MAINTENANCE OF
MACKENZIE DELTA GAS PROCESSING PLANTS

OCCUPATION	PERSONS REQUIRED
Plant/Field Trainee	10
Maintenance Trainee	7
Clerk/Stenographer	2
Bookkeeping Clerk	3
Cook's Helper	3
Camp Attendant	6
Operator, Snow Clearing/Grading	3
Roustabout	16
Laboratory Technician	3
Bookkeeper	3
Cook	3
Shift Foreman	6
Operator	10
Maintenance Foreman	3
Maintenance Mechanic	16
Electrician	6
Welder	6
Pipefitter	7
Field Foreman	2
Production Maintenance/Utility Man	7
Roustabout Foreman	6
Superintendent	8
Stock Control Clerk	3
Multiple Vehicle Operator	3
Heavy Duty Mechanic	3
Management/Administration/Exped iting/Accounting	10
TOTAL	155

Source: Information provided by Imperial, Gulf, and Shell Oil.

FIGURE 3

MANPOWER REQUIREMENTS'
OPERATION AND MAINTENANCE OF
MACKENZIE VALLEY GAS PIPELINE
(INUVIK DISTRICT)

OCCUPATION	YEAR OF OPERATION				
	1	2	3	4	5
Division Manager	1	1	1	1	1
Administration, Personnel, Public Relations and Training	2	2	2	2	2
Engineering, Technical, Environmental, Lands and Right-of-Way	2	2	2	2	2
c erical	4	4	4	4	4
D strict Superintendent	1	1	1	1	1
D strict Engineer	1	1	1	1	1
P lot	2	2	2	2	2
F ight Engineer	2	2	2	2	2
Clerical	4	4	4	4	4
Maintenance Supervisor	1	1	1	1	1
Foreman	1	2	2	2	2
Mechanic	2	4	4	4	4
Operator	3	6	6	6	6
Welder	2	3	3	3	3
Maintenance Man	8	12	12	12	12
Chief Technician	1	1	1	1	1
Technician	17	29	32	31	31
TOTAL	54	77	80	79	79

[1]Manpower requirements are expected to stabilize by the fifth year. "

Source: Operations and Maintenance Plans, Section 136, Application to Construct Pipeline Facilities, CAGPL.

FIGURE 4

MANPOWER REQUIREMENTS
OTHER HYDROCARBON INDUSTRY ACTIVITIES

OCCUPATION	CCDO	YEAR											
		1	2	3	4	5	6	7	8	9	10	1112-21	
FIELD													
Clerical	4111	10	15	20	25	30	35	40	45	50	55	60	65
Salesmen	5177	20	30	40	50	60	70	80	90	100	110	120	130
Foremen	7710	10	15	20	25	30	35	40	45	50	55	60	65
Rotary Drillers	7711	118	180	240	300	360	420	480	540	600	660	720	780
Mechanics	8584	39	60	80	100	120	140	160	180	200	220	240	260
	TOTAL	197	302	400	500	600	700	800	900	1000	1100	1200	1300
EXPLORATION													
Engineers	2154	18	18	18	17	17	17	16	16	16	16	15	15
Technicians	2165	18	18	18	17	17	17	16	16	16	16	15	15
Cooks	6121	27	27	26	26	26	25	25	24	24	24	23	23
Cook Helpers	6139	27	27	26	26	26	25	25	24	24	24	23	23
Labourers	6198	18	18	18	17	17	17	16	16	16	16	15	15
Rotary Drillers	7711	137	135	132	130	128	126	124	122	120	118	115	113
Drivers	9179	91	90	88	87	85	84	83	81	80	78	77	75
	TOTAL	355	350	344	338	333	328	322	316	311	306	300	294

FIGURE 4 CONTINUED

OCCUPATION	CCDO	YEAR											
		1	2	3	4	5	6	7	8	9	10	11	12-21
SEISMIC													
Surveyors	2161	23	28	33	38	43	44	54	59	64	70	75	80
Technicians	2165	15	18	22	25	29	32	36	39	43	46	50	53
Cooks	6121	8	9	11	13	14	16	18	20	21	23	25	27
Cook Helpers	6139	8	9	11	13	14	16	18	20	21	23	25	27
Labourers	6198	8	9	11	13	14	16	18	20	21	23	25	27
Rotary Drillers	7711	23	28	33	38	43	49	54	59	64	70	75	80
Other Drillers	7713	23	28	33	38	43	49	54	59	64	70	75	80
Blasters	7715	15	18	22	25	29	32	36	39	43	46	50	53
Other Oil and Gas	7719	38	46	55	64	72	81	90	99	107	116	125	134
Equipment Operators	8711	8	9	11	13	14	16	18	20	21	23	25	27
Drivers	9179	30	37	44	51	58	65	72	79	88	93	100	107
Labourers	9918	15	18	22	25	29	32	36	39	43	46	50	53
	TOTAL	212	259	308	357	406	455	504	553	602	651	700	749
	TOTAL	764	909	1052	1195	1339	1483	1626	1769	1913	2057	2200	2343

Note: Totals may not agree with sum of parts due to rounding.

Source: Manforce Research Associates with information from *"Communities of the Mackenzie - Effects of the Hydrocarbon Industry"* and submission to the National Energy Board of Foothills Pipeline Ltd.

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FIGURE 5

TIMING
CONSTRUCTION OF GAS PROCESSING PLANTS
(MANPOWER REQUIRED)

SPECIFIC ACTIVITY	YEAR 1		YEAR 2		YEAR 3		YEAR 4	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Dock and Staging Area			42					
Gathering Lines					46			
Airstrip and Hangar					48			
Cluster Facilities			114		114			
Gas Plant				320	320	320	320	
Gravel Hauling	390		390					
TOTAL	390		546	320	528	320	366	

Note: Ten Management/Administration/Account ing/Expediting persons will be required during the construction phase and will continue into operation phase.

Source: Manforce Research Associates from information supplied by Imperial, Gulf, and Shell Oil.

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FIGURE 6

TIMING'
OPERATION AND MAINTENANCE
OF GAS PROCESSING PLANTS

OCCUPATION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Operations Personnel	145	145	145	145	145
Accounting/Administration/ Expediting Personnel	10	10	10	10	10

1 Information from Proponents indicates that activity continues at noted levels during plant life expectancy.

Source: Information provided by Imperial, Gulf, and Shell Oil.

FIGURE 7

MANPOWER REQUIREMENTS
ACTIVITIES

ACTIVITY	YEAR											
	1	2	3	4	5	6	7	8	9	10	11	12-21
Gas Plant Construction			390	546	528	366						
Gas Plant Operation							155	155	155	155	155	155
Pipeline Operation							54	77	80	79	79	79
Field	197	302	400	500	600	700	800	900	1000	1100	1200	1300
Exploration	355	350	344	338	333	328	322	316	311	306	300	294
Seismic	212	259	308	357	406	455	504	553	602	651	700	749
TOTAL	764	911	1842	1741	1867	1849	1835	2001	2148	2291	2434	2577

[1] Peak annual levels.

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FIGURE 8

DISTRIBUTION OF GROWTH RATES AND SECONDARY EFFECTS BY INDUSTRY AND COMMUNITY

Prepared by MRA MANFORCE RESEARCH ASSOCIATES February, 1976

INDUSTRY	PERCENT OF HYDROCARBON SECONDARY EFFECTS	COMMUNITY*				PERCENT GROWTH IN TRENDS
		INUVIK	TUKTOYAKTUK	KLAVIK	ST. MCPHERSON	
Agriculture	0					0
Forestry	10				100	3
Hunting, Fishing, and Trapping	0					2
Mines and Oil Wells	0					2
Manufacturing	4	75	8	9	8	6
Construction	8	.97	3			8 (75-80) 2 (81-85)
Transportation	13	100				7
Trade	27	.90	5		5	6
Finance, Insurance, and Real Estate	20	100				16
Service	1	4 100				6
Government	4	98	1		1	5

*All other communities were assured to receive no secondary effects.

Source: Manforce Research Associates and Department of Economic Development, Government of the Northwest Territories.

Department of Indian and Northern Affairs. All other data, except when specifically noted otherwise, was developed by the consultant through either various singular investigations or through the employment impact model.

Considering the fact that the data foundation for the employment impact model has been the information provided by TERIS, it should be noted that this information was derived from the results of a sample survey and as such may be subject to sampling errors. As a result, we have used the data provided with consideration of the potential inherent difficulties. With this in mind we point out that it is the degree and amplitude of our specified findings that should be considered. The emphasis should be placed on the comparative positions of the alternate scenarios and not the absolute values. When TERIS project personnel have had sufficient time to thoroughly assess their data, it will be possible to make a statement regarding accuracy; however, at this time we can only use caution in our interpretation of the data and the results of our investigations and concentrate on interrelationships rather than specific countings.

During the course of this study it has been necessary to make certain limiting assumptions in order to deal with areas that could not be otherwise quantified. In all cases we have attempted to proceed in what we felt was the most reasonable fashion. The next section deals with the specification of these qualifying notations.

D. QUALIFICATIONS

The forecast labour demand for jobs in the hydrocarbon industry has been distributed by community based on the existing proportion of hydrocarbon jobs held by each community, with consideration for the additional number of jobs that each community could fill, as illustrated by unemployment rates.

The employment multiplers[2] used in the employment impact model were calculated by using the economic base approach to multiplier determination. These multiples were then applied to the figures for hydrocarbon industry employment by community to arrive at the total secondary effects of hydrocarbon employment. The total of these effects was then distributed by industry and community (see Figure 8) according to the shares held by each component, as indicated by the evaluation of existing infrastructures identified by ourselves and the Department of Economic Development; the result being the secondary effects of hydrocarbon activity, distributed by industry and community.

1.25 this year → 1.31 [illegible]

[2] Under the economic base approach to multiplier determination "you first compare the distribution of employment, by industry for the Delta, to that found in the rest of Canada in order to determine what proportion of the jobs, by industry, are attached to local consumption and what proportion are attached to the production of export goods and services. You then determine the number of local jobs created for each export job. The result is the multipler for export jobs which are located in the Delta. To obtain the multipler for commuting jobs (workers come in to the Delta to work and go out to spend their salaries) the resident job multipler was adjusted according to the amount of that multipler which appl ies to commuting jobs (based on Alaska experience) and further reducing that amount to account for Alaska/Delta differences.

These secondary effects were then added to the trends in employment growth by industry for all other industries, based on growth rates for each industry supplied by the Department of Economic Development, which were applied to base employment figures provided by TERIS. The non-specified responses were distributed across each industry according to the existing situations; the result of this being identification of the effect of direct and secondary hydrocarbon activity on the employment growth in all industrial sectors. Distribution of the results by occupation was determined by applying current distributions, as indicated by TERIS, to these figures. Consistent with this we have assumed that industry and community shares of activity remain constant over the forecast period.

Finally, a list of assumptions that are of general concern is provided following.

1. Assume supply and demand movement until a "novacancies" position is reached.
2. Assume equal distribution of skills among the study area communities.
3. In-migrants assumed to be of the same age distributions as the "Others" category from TERIS.
4. All in-migrants were assumed to go to either the gas plant sites or to Inuvik.

5. Assume that all vacancies can be' filled by in-migrants after all Delta residents are looked at to fill the vacancies. (Residents must have required skills to be" considered.)

6. Inter-community migration is migration of the population (workers times family size).

7. Assume that approximately 10% of the unemployed labour force will relocate. to obtain employment.

SECTION II

LABOUR MARKET VARIABLES

II. LABOUR MARKET VARIABLES

A. CURRENT LABOUR FORCE

As mentioned previous y, we have defined the current labour force age group of the Delta, for the purposes of this study, as those persons residing in the study area communities[3] who were between the ages of 15 and 64 years inclusive as of January 1, 1975.[4] In order to calculate those numbers as totals it was necessary to adjust the absolute numbers provided by the TERIS sample according to an adjustment co-efficient based on the total estimated population for the concern area.[5] This procedure allowed us to calculate the coverage factor for TERIS so that we could use the component distributions of-that project's data to produce tables on total numbers of persons in the various categories indicated.

Figure 9 following shows the number of persons estimated to be in each study area community, dissaggregated by age group, sex, and ethnic origin. These figures were subsequently used as a basis for projections of abour supply. Of course, labour supply estimates use only tota figures but we have not found any

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[3] The communities dealt with are Aklavik, Arctic Red River, Fort McPherson, Fort Franklin, Fort Good Hope, Inuvik, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Colville Lake.

[4] As TERIS data was collected during the period November 1974 to March 1975, we have considered the ages reported in the data so collected as referring to January 1, 1975 as the date for inclusion as an interview event.

[5] Figures provided by the Regional Planning Section, Department of Indian and Northern Affairs.

indications that the components illustrated are not applicable to developed figures as well, with consideration of course, of component specific participation rates. Also, care must be taken when considering the indicated cohort figures as sampling error may cause overstatement in some areas.

Figures 10 shows the distribution of the current labour force aged persons among the employed, unemployed, and never employed. The employment status is, as well, further disaggregated to illustrate the distributions by age groups, sex, ethnic origin, and highest grade completed. It should be noted that although unemployment rates may be calculated from the figures in this figure, the number unemployed and unemployment rates produced by the employment model are derived by a different means, which incorporates participation rate adjustments, and as such are not directly comparable.

The information in Figure 10 shows that the Delta employed and unemployed are distributed in much the same manner as is the case in the rest of Canada. The number of persons in the 14 - 24 year age group of the "NEVER EMPLOYED" category seems higher than normal; however, we suspect that this situation is made to look abnormal because of the inclusion of persons too young, or generally in school, with the working young. The availability of figures for the labour force aged persons by five-year age groups would most likely show that a large portion of the "NEVER EMPLOYED" in the 14 - 24 year age group were actually less than nineteen years of age.

FIGURE 9

NUMBER OF PERSONS
BY AGE, SEX, AND ETHNIC ORIGIN - 1975*

AGE GROUP	MALE TOTAL	MALE INDIAN	MALE ESKIMO	MALE METIS	MALE OTHER	FEMALE TOTAL	FEMALE INDIAN	FEMALE ESKIMO	FEMALE METIS	FEMALE OTHER	TOTAL
AKLAVIK											
15-19	59	5	31	13	10	60	15	29	11	5	119
20-24	24	3	12	7	2	20	2	10	4	4	44
25-34	40	9	13	8	10	34	10	15	4	5	74
35-44	28	8	14	2	4	31	2	22	3	4	59
45-54	16	3	8	3	2	22	4	12	4	2	38
55-64	29	7	12	3	7	31	8	8	10	5	60
TOTAL	196	35	90	36	35	198	41	96	36	25	394
TUKTOYAKTUK											
15-19	35		35	-	-	40	-	40			75
20-24	37	1	36	-	-	37	-	36	1		74
25-34	48	1	47	-	-	40	3	37			88
35-44	23		23	-	-	20		20			43
45-54	28		28	-	-	17	-	17			45
55-64	28		28	-	-	25	1	24		-	53
TOTAL	199	2	197	-	-	179	4	174	1		378
INUVIK											
15-19	125	3	26	6	90	94	3	29	15	47	219
20-24	219	20	44	9	146	169	23	41	6	99	388
25-34	328	20	55	6	247	204	23	32	6	143	532
35-44	166	9	29	9	119	128	3	26	15	84	294
45-54	103	6	15	3	79	70	9	23	6	32	173
55-64	35	6	9	3	17	44	6	12	3	23	79
TOTAL	976	64	170	36	698	709	67	163	51	428	1685

FIGURE 9 CONTINUED

AGE GROUP	MALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	FEMALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	TOTAL
FT. McPHERSON											
15-19	25	21		2	2	64	51		13		89
20-24	25	19		6	-	23	19		4	-	48
25-34	61	49		8	4	47	34		9	4	108
35-44	47	41		4	2	23	17		6		70
45-54	27	23		4		25	23		2		52
55-64	23	13		8	2	25	21	-	2	2	48
TOTAL	208	166		32	10	207	165		36	6	415
FT. FRANKLIN											
15-19	17	16			1	18	18				35
20-24	11	11				13	13				24
25-34	27	26			1	14	13			1	41
35-44	11	11				20	20				31
45-54	4	4				13	13				17
55-64	13	10			3	13	13		-	1	26
TOTAL	83	78			5	91	90			1	174
NORMAN WELLS											
15-19	4				4	14	2			12	18
20-24	8	2		2	4	10	2		-	8	18
25-34	31			2	29	29	2		4	23	60
35-44	25			2	23	23	4		4	15	48
45-54	8			2	6	10	2		2	6	18
55-64	20	6	-	2	12	10	2	..	4	4	30
TOTAL	96	8		10	78	96	14		14	68	192

FIGURE 9 CONTINUED

AGE GROUP	MALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	FEMALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	TOTAL
SACHS HARBOUR											
15-19	11		11			11		11			22
20-24	4		4			7		7			11
25-34	5		5			7		7			12
35-44	9		9		-	16		16			25
45-54	7		7			2		2			9
55-64	5	-	5	-	-	7		7	-	-	12
TOTAL	41		41			50		50			81
PAULATUK											
15-19	3		3			3		3			6
20-24	4		4			2		2			6
25-34	7		7			9		9			16
35-44	6		6			2		2			8
45-54	2		2			5		5			7
55-64	2		2			-		-		-	2
TOTAL	24		24			21		21			45
ARCTIC RED RIVER*											
15-19	11	1	6	2	2	11	3	5	2	1	22
20-24	4	1	2	1		4		2	1	1	8
25-34	7	2	2	1	2	7	2	3	1	1	14
35-44	5	1	3		1	6		4	1	1	11
45-54	3	1	1	1		4	1	2	1		7
55-64	5	1	2	1	1	5	1	1	2	1	10
TOTAL	35	7	16	6	6	37	7	17	8	5	72

FIGURE 9 CONTINUED

AGE GROUP	MALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	FEMALE TOTAL	INDIAN	ESKIMO	METIS	OTHER	TOTAL
COLVILLE LAKE*											
15-19	6	1	3	1	1	6	1	3	1	1	12
20-24	2		1	1	-	1		1			3
25-34	4	1	1	1	1	3	1	1		1	7
35-44	2	1	1	-	-	2		2			4
45-54	1		1	-	-	1		1			2
55-64	3	1	1	-	1	4	1	1	1	1	7
TOTAL	18	4	8	3	3	17	3	9	2	3	35
FT. NORMAN*											
15-19	15	14			1	16	16	-			31
20-24	10	10				11	11	-			21
25-34	24	23			1	12	11	-		1	36
35-44	10	10				18	18	-			28
45-54	4	4				11	11	-			15
s5-64	9	9				11	11	-			20
TOTAL	72	70			2	79	78	-		1	151
FT. GOOD HOPE*											
15-19	11	9		1	1	29	23	-	6		40
20-24	12	9		3	-	10	8	-	2		22
25-34	27	22		3	2	21	15	-	4	2	48
35-44	22	19		2	1	11	8	-	3		33
45-54	12	10		2	-	11	10	-	1		23
55-64	10	6		3	1	12	9	-	1	2	22
TOTAL	94	75		14	5	94	73	-	17	4	188

*Note: Figures for Arctic Red River, Colville Lake, Ft. Norman, and Ft. Good Nope were arrived by using the proportionate distributions of Aklavik, Ft. Franklin, and Ft. McPherson respectively to the total estimated populations of the former. , For these communities "-" can mean either NO DATA PROVIDED BY TERRITORIAL OR ROUNDING MOVED FIGURE TO ZERO.

FIGURE 10

EMPLOYMENT SITUATION
MACKENZIE DELTA REGION*

	EMPLOYED	UNEMPLOYED	NEVER EMPLOYED	TOTAL
AGE				
14-24	588	140	633	1361
25-34	83o	125	70	1025
35-44	548	65	23	636
45-54	410	30	23	463
55-65	240	33	18	291
Not Specified	43	8	18	69
TOTAL	2659	401	785	3845
SEX				
Male	1465	273	315	2053
Female	1188	125	468	1781
Not Specified	2	1	0	3
TOTAL	2655	399	783	3837
ETHNIC ORIGIN				
Indian	353	190	205	748
Eskimo	1003	143	383	1529
Met is	200	43	113	356
Other	1103	25	83	1211
TOTAL	2659	401	784	3844
HIGHEST GRADE**				
1-5	345	65	40	450
6-10	448	195	183	826
11	15	13	5	33
12	55	30	10	95
Unspecified	1793	85	168	2046
TOTAL	2656	388	406	3450

$'Includes the communities of Aklavik, Arctic Red River, Ft. Franklin, Ft. Good Hope, Ft. McPherson, Inuvik, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Colville Lake.

**This Table deals only with the respondents who had completed their education. Those still attending are not included.

Note: The total number of events in any table (except as noted) should approximate 3840. Variations from this amount are the result of rounding when applying the adjustment co-efficient of 2.5.

Source: Territorial Employment Record and Information System (TERIS)

FIGURE 11 DRAFT ONLY

FREQUENCY DISTRIBUTIONS
MACKENZIE DELTA REGION*

BY AGE

14-24	25-34	35-44	45-54	55-65	NOT SPECIFIED	TOTAL
1360	1025	635	463	290	68	3841

BY SEX

MALE	FEMALE	NOT SPECIFIED	TOTAL
2053	1780	8	3841

BY INDUSTRY

01	02	03	04	05	06	07	08
0	8	113	408	15	165	273	318

09	10	11	12	13	14	15	16	00	TOTAL
38	250	178	278	195	0	0	0	1605	3844

BY MARITAL STATUS

SINGLE	MARRIED	WIDOWER	DIVORCED	NOT SPECIFIED	TOTAL
1433	1308	48	10	1043	3842

BY ETHNIC ORIGIN

INDIAN	ESKIMO	METIS	OTHER	TOTAL
748	1528	355	1210	3841

BY HIGHEST GRADE COMPLETED'

1 - 6-10	11	12	NOT SPECIFIED	TOTAL
450 825	33	95	2045	3448

~'includes the communities of Aklavik, Arctic Red River, Ft. Franklin, Ft. Good Hope, Ft. McPherson, Ft. Norman, Inuvik, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Colville Lake.

Note: The total number of events in any table (except as noted) should approximate 3340. Variations from this amount are the result of rounding when applying the adjustment co-efficient of 2.5.

1 When number currently attending is added the total will approximate 3840.

Source: Territorial Employment Record and Information System (TERIS)

Prepared by MRA MANFORCE RESEARCH ASSOCIATES February, 1976 . . .24

The large number of "UNSPECIFIED" entries for employment situation by highest grade indicates that these figures should be used with caution. It is likely that the unspecified entries are distributed in a 1 ike fashion to the specified entries, but until the facts of this are known it is advisable to keep the limitations of the data in mind.

B. FORECAST LABOUR SUPPLY

1. Supply by Community

Figures 12A through 12D following specify the amount of labour supply expected in each study region community under the LOW IMPACT, NET IMPACT OF GAS PROCESSING PLANTS, NET IMPACT OF OTHER HYDROCARBON, and NO HYDROCARBON conditions respectively. There figures incorporate the general increase in the labour supply due to population growth and include, as well, adjustments in inter-community migration and fluctuating participation rates over the forecast period 1975 - 1985. The last adjustment to be made is to add the number of southern migrants and place them in the CAMP if they will be commuting from the south to work sites in the Delta and in Inuvik if they are to become residents of the Delta. The amounts to be included are calculated by the differences between labour supply and demand on an occupational basis.

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FIGURE 12A

LABOUR SUPPLY BY COMMUNITY ANO YEAR

-LOW IMPACT-

	YEAR										
COMMUNITY	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	197	226	256	282	296	309	336	339	363	383	402
Inuvik	1400	1644	2132	2418	2504	2648	2813	2878	3136	3391	3616
Ft. Good Hope	41	43	49	51	56	58	62	69	71	74	81
Ft. Norman	69	74	78	83	87	89	93	96	101	106	109
Colville Lake	15	15	16	19	21	21	23	26	24	26	28
Paulatuk	27	30	32	34	35	37	39	40	41	42	44
Arctic Red River	33	33	36	40	42	44	48	50	51	57	58
Aklavik	98	116	131	148	152	160	173	176	184	192	204
Norman Wells	110	115	122	128	131	137	145	148	154	159	164
Ft. Franklin	49	51	55	56	58	60	64	64	68	70	73
Sachs Harbour	38	40	44	45	48	49	52	50	52	55	57
Ft. McPherson	139	181	226	268	280	296	324	315	336	358	379
Camp	519	534	862	969	1118	1242	1055	1281	1373	1474	1582
TOTAL	2735	3102	4039	4541	4828	5150	5227	5532	5954	6387	6797

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

DRAFT ONLY

FIGURE 12B

LABOUR SUPPLY BY COMMUNITY AND YEAR

-NET IMPACT OF GAS PROCESSING PLANTS-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	0	0	5	1	4	2	2	-3	1	-1	-6
Inuvik	0	0	191	129	81	21	-103	59	0	41	22
Ft. Good Hope	0	0	1	0	0	0	0	0	0	0	0
Ft. Norman	0	0	0	0	0	0	0	0	0	0	0
Colville Lake	0	0	0	0	0	0	0	0	0	0	0
Paulatuk	0	0	0	0	0	0	0	0	0	0	0
Arctic Red River	0	0	0	0	0	0	0	1	-1	-1	-1
Aklavik	0	0	0	1	1	1	1	1	0	1	0
Norman Wells	0	0	0	0	0	1	2	2	1	-1	-1
Ft. Franklin	0	0	-1	-2	0	0	0	0	0	0	0
Sachs Harbour	0	0	0	0	0	0	0	0	0	0	0
Ft. McPherson	0	0	12	15	15	13	12	6	5	5	6
Camp	0	0	380	470	470	470	145	145	145	145	145
TOTAL	0	0	588	614	571	508	59	211	151	188	165

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

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FIGURE 12C

LABOUR SUPPLY BY COMMUNITY AND YEAR

-NET IMPACT OF OTHER HYDROCARBON-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyakluk	53	76	92	115	114	122	138	135	146	159	171
Inuvik	176	367	579	852	917	1043	1251	1076	1320	1466	1593
Ft. Good Hope	6	5	7	8	9	9	13	13	14	14	14
Ft. Norman	0	0	1	3	4	1	2	0	2	1	2
Colville Lake	2	2	2	3	4	3	3	5	3	4	4
Paulatuk	0	3	3	4	4	4	5	4	5	5	5
Arctic Red River	4	5	3	6	4	5	8	7	9	9	9
Aklavik	11	24	38	44	43	42	50	48	53	51	50
Norman Wells	0	2	4	5	3	3	3	1	2	4	3
Ft. Franklin	2	1	2	1	-	3	-4	-4	-7	-6	-6	-7
Sachs Harbour	0	1	5	4	4	5	6	4	3	4	3
Ft. McPherson	36	70	99	129	132	140	164	151	168	180	189
Camp	519	534	482	499	648	772	910	1136	1228	1329	1437
TOTAL	809	1090	1317	1673	1885	2148	2549	2573	2947	3220	3473

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

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FIGURE 12D

LABOUR SUPPLY BY COMMUNITY AND YEAR

-NO HYDROCARBON-

	YEAR										
COMMUNITY	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	144	150	159	166	178	185	196	207	216	225	237
Inuvik	1224	1288	1362	1437	1506	1584	1665	1743	1816	1884	2001
Ft. Good Hope	35	37	41	43	45	47	49	56	57	60	67
Ft. Norman	69	74	77	80	83	88	91	96	99	105	107
Colville Lake	13	13	14	16	17	17	20	21	21	22	24
Paulatuk	27	27	29	30	31	33	34	36	36	37	39
Arctic Red River	29	28	33	34	38	39	40	42	43	49	50
Aklavik	87	92	93	103	108	117	122	127	131	140	154
Norman Wells	110	113	118	123	128	133	1411	145	151	157	162
Ft. Franklin	47	50	54	57	61	64	68	71	74	76	80
Sachs Harbour	38	39	39	41	44	44	46	46	49	51	54
Ft. McPherson	103	111	115	124	133	143	148	158	163	173	184
Camp	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1926	2022	2134	2254	2372	2494	2619	2748	2856	2979	3159

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

Under the LOW IMPACT case the labour supply for the study area is expected to rise from 2735 in 1975 to 6797 in 1985, an increase of 4062 persons. If there were to be no hydrocarbon activity in the Delta (see Figure 12D) the change would be from 1926 to 3159 over the ten years, a change of only 1233 persons or approximately 40% of the increase expected under the LOW IMPACT case.

Of this change of 4062 persons under the LOW IMPACT case, only four percent would be due to the effect of the gas processing plants while the activity in OTHER HYDROCARBON areas would account for 66% of the increase. That leaves 30% of the increase to be accounted for by the natural growth of the economy expected without the influence of the hydrocarbon industry.

The greatest degree of growth by community under the LOW IMPACT scenario would be experienced by the CAMP (205%); followed by Ft. McPherson, Inuvik, Aklavik, and Tuktoyaktuk at 173%, 158%, 108%, and 104% repsectively. The growth in the CAMP is explained by considering that it receives all of the commuting positions while the communities of Ft. McPherson, Inuvik, Aklavik, and Tuktoyaktuk experience growth as a result of their shares in hydrocarbon and other industry employment. Each community experiences net growth over the concern period but the most extensive growth does occur in those communities which have either major portions of the hydrocarbon employment or whose industries receive support

from hydrocarbon activity. This is borne out when the NO HYDROCARBON case is examined, showing the significant decline in labour supply for major, hydrocarbon related communities.

When considering the specific effect of the gas plants on labour supply we see that major increases are incurred during the construction years, with a drop to significantly lower levels during the subsequent periods of operational activity only. Of importance to note is the distribution of the labour supply due to gas plant activity according to affected community. Only Tuktoyaktuk, Inuvik, Ft. McPherson, and the CAMP experience significant changes in labour supply while for the other communities the changes are either zero or almost negligible. It should also be noted that very minor changes in any community may be the result of mechanical processes of disaggregation. Thus it is more accurate to deal with trends than specific countings.

As well, the entries for CAMP labour supply in YEARS 3, 4, 5, and 6 are different from those found in Figure 5. Due to the problem of dealing with annual figures for a two-season per year activity, we attempted to normal ize the numbers over the entire period of construction activity. As a result the labour supply and demand figures are more representative of standardized numbers than of specific countings.

With respect to the effect of the OTHER HYDROCARBON activity as a component of the LOW IMPACT scenario, Figure 12C shows that continued consistent growth is evident as opposed to the rise and fall movement found in the GAS PLANTS component. This gradual growth is experienced in every major community with the only departures found in the smaller communities where workers are leaving to seek out the growth areas. Also, the net effect of the OTHER HYDROCARBON component is distributed to a more or less extent among all the communities rather than among the major centres only. This indicates the much wider influence area of these assorted developments as opposed to the specific locale of gas plant influence.

The last figure in the labour supply series deals with the NO HYDROCARBON case which represents the growth in the study area expected if there were no hydrocarbon industry activity. This figure presents an even more stable growth pattern and community distribution than did the OTHER HYDROCARBON component, an expected position given the greater industrial variety of activity included. Also of note is that by definition, this case does not include any CAMP labour supply, a fact which removes a major fluctuation source.

2. Supply by Occupation

The occupational distribution of labour supply under the LOW IMPACT case is provided in Figure 13 following. The occupational titles (from Canadian Classification and Dictionary of Occupations-CCDO) are found in Appendix A.

OCCUPATIONAL ANALYSIS

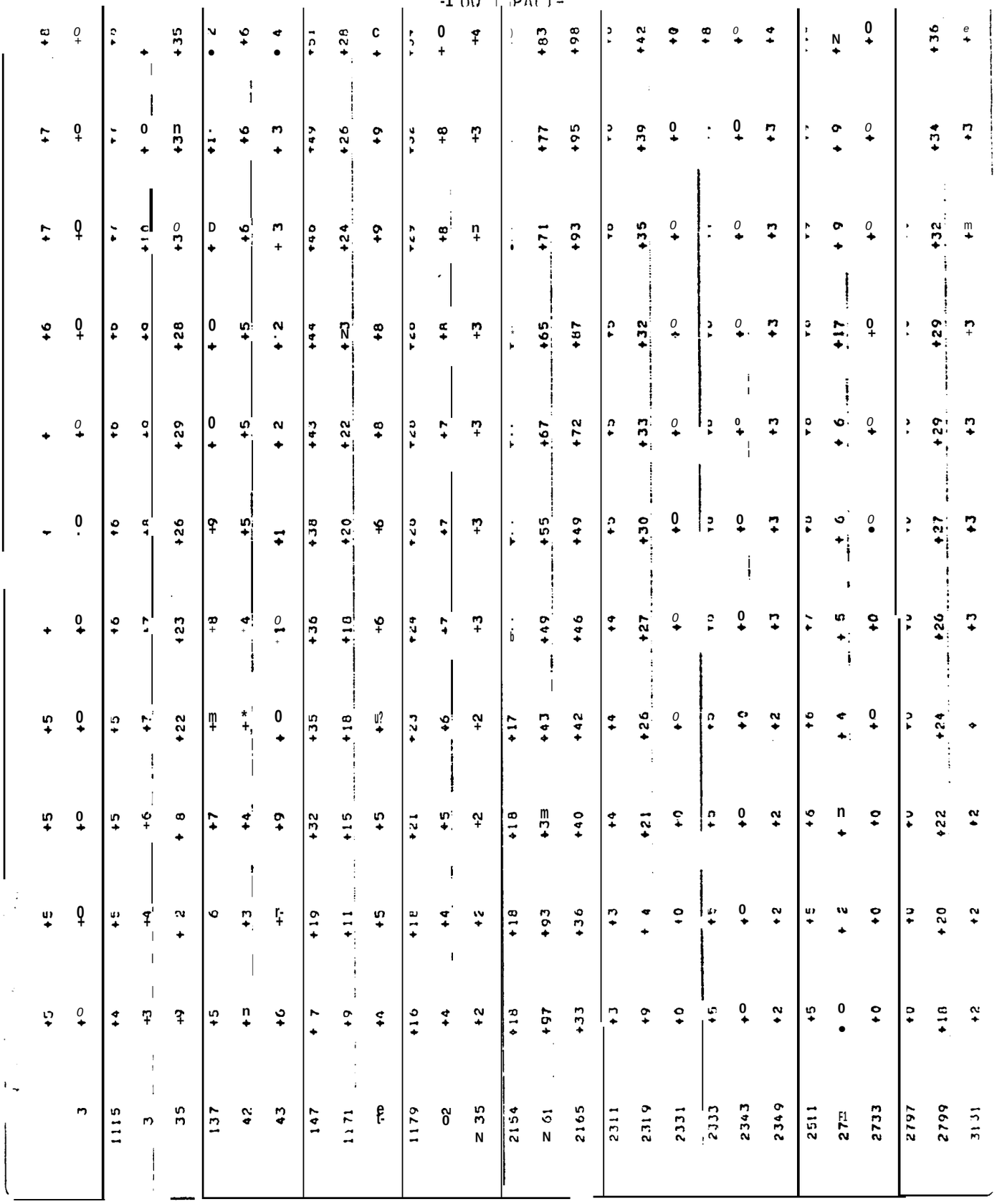
To be provided in Stage Two of this report.

FIGURE 13

DRAFT ONLY

LABOUR SUPPLY BY COMMUNITY AND YEAR

-1 OU | PACT-



31	+2	42	+0	+0	+0		+1	+0	+0	+0	
3135	+8	48	+9	+9	+10	+11	+12	+11	+13	+13	+14
3139	+7	+7	+5	+5	+6	+6	+6	+6	+7	+7	+8
3102	+0	+0	+0	+0	+0	to	+0	+0	+0	+0	+0
3313	+5	+6	+7	+8	+8	+9	+10	+10	+10	+11	+12
3337	+9	+11	+12	+13	+14	+15	+16	+16	+18	+19	+21
3355	+0	40	+0	+0	+0	+0	+0	+0	+0	to	+0
3301	+2	+ 2	+3	+4	+4	+4	+4	+5	45	+5	+6
3710	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3715	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
3719	+31	+26	+10	+13	+13	+15	+20	+16	+17	+19	+21
4111	+54	+59	+73	+85	+92	+103	4122	+129	+140	+150	4160
4113	+11	+13	+13	+15	+16	+16	+18	+18	+19	+21	+22
4130	+7	+8	+10	+12	+12	+13	+14	+15	+16	+17	+18
4131	+5	+5	+5	+6	+7	+7	+14	+14	+14	+15	+16
4133	+21	+29	+39	+46	+48	+53	+58	+57	+62	+68	+72
4135	+10	+14	+21	+26	+27	+30	+33	+32	+35	+39	+42
4151	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4153	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
4155	+61	+69	+81	+90	+94	+102	+111	+115	+124	+132	+140
4159	+2	+2	+3	+4	+4	+4	+4	+5	+5	+5	+6
4169	+20	+23	+26	+29	+31	+33	+36	+37	+40	+43	+46
4170	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
4171	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
4173	+10	+10	+10	+11	+12	+12	+13	+13	+14	+15	+16
4175	t 2	+3	+3	+4	OK	+4	+5	+5	+5	+6	+6
4190	+23	+24	+27	+29	+31	+33	+34	+36	+37	+39	+42
4191	+2	+2	+3	+4	+4	+4	+4	+5	+5	+5	+6
4193	??	+7	+7	+8	+8	+9	+11	+10	+11	+12	+13
4194	+6	+7	+8	+9	+9	+10	+10	+11	+12	+12	+13

FIGURE 3 CONTINUED

FIGURE 13 CONTINUED

	1975										1985
4197	+26	+32	+40	+46	+48		+58	+58	+62	+67	472
4109	+24	+23	+24	+26	+28	+29	+30	+32	+34	+35	+38
5130	+41	+44	+43	+49	+52	+55	+62	+61	+65	+69	+74
5135	+2	+2	+3	+4	+4	+4	+4	+5	+5	+5	+6
5137	+73	+85	+103	+116	+121	+130	+140	+143	+153	+163	+173
5177	+20	+30	+40	+50	+60	+70	+80	+90	+100	+110	+120
5101	+5	+6	+7	+8	+8	+9	+10	+10	+10	+11	+12
5102	+5	+6	+7	+8	+8	49	41	Q	+10	+10 +11	+12
6111	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
6112	+0	to	+0	+0	+0	+0	+0	+0	+0	+0	+0
6115	+5	+5	+5	+5	+6	+6	+6	+6	+7	+7	+8
6120	+6	+7	t8	+9	+9	+10	+10	+11	+12	+12	+13
6121	+64	+69	+76	+83	+86	+90	+99	+101	+105	+112	+117
6123	+21	+24	+28	+ ?	+33	+35	+38	+39	+42	+44	+47
6125	+70	479	+92	+104	+109	+116	+124	+129	+137	+145	+155
6129	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6	+6
6130	+7	+8 +9		+9	+10	+11	+ 11 +1	l	+13	+13	+14
6133	+18	+21	+24	+27	+ 28	+30	+32	+33	+36	+38	+40
6139	+35	+36	+37	+39	+50	+41	+49	+50	+51	+53	+54
6144	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
6147	+0	+0	to	+0	+0	+0	+0	+0	+0	+0	+0
6149	+6	+6	+5	+5	+1>	+6	+6	+6	+7	+7	+8
6160	+6	+7	+8	+9	+9 +10	+10	+11			+12	*I3
6161	+7	+8	+11	+12	+13	+15	+16	+16	+17	+18	+20
6165	+6	+7	+8	+9	+9	+10	+10	+11	+12	+12	+13
6191	460	+68	+77	+85	+92	+96	+102	+104	+11	+117	+124
6198	+98	+111	+134	+152	+159	+170	+185	+190	+202	+215	+228
6101	+7	+8	+8	+8	+9	+9	+9	+9	+10	+10	+11
G102	+5	+5		+5	+6	+6	+6	+6	+7	+7	+8

7313	+2	+1	+1	+1	+1		+1	+1	+2	+2	+2
7315	+119	+95	+76	+77	+79	+80	+85	+85	+86	+86	+91
7511	+16	+17	+18	+20	+21	+22	+23	+24	+25	+27	+28
7513	+23	+40	+67	+84	+88	+95	+105	+98	+109	+117	+125
7710	+28	+33	+38	+42	+47	+52	+71	+68	+81	+86	+90
7711	+278	+343	+405	+468	+531	+595	+674	+714	+800	+864	+926
7713	+23	+28	+33	+38	+43	+49	+54	+59	+64	+70	+75
7715	+44	+34	+30	+33	+38	+41	+45	+48	+53	+56	+60
7718	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7719	+38	+46	+55	+64	+72	+81	+90	+99	+107	+116	+125
7701	+45	+39	+3	+3	+3	+3	+8	f.?.	'3	+3	+3
7 '02	+241	+107	+6	+6	+6	+7	+12	+7	+7	+7	+7
8160	+0	+0	+0	+0	+0	+0	+8	+8	+8	+8	+8
8165	+6	+6	+6	+6	+7	+7	+23	+23	+23	+23	+23
8176	+0	+0	+0	+0	+0	+0	+3	+3	+3	+3	+3
8231	+7	*8	+11	+13	+14	+15	+16	+17	+18	+18	+21
8238	+3	+4	+6	+7	+7	+8	+9	+9	+10	+10	+11
8295	+23	+27	+32	+37	+39	+41	+45	+45	+49	+52	+55
8311	+0	+0	to	+0	to	+0	+0	+0	+0	+0	+0
8313	+0	+0	+0	+0	+0	+19	+19	+0	+0	+0	+0
8315	+0	to	+0	+0	to	+0	+0	+0	+0	+0	+0
8319	+0	to	to	+0	+0	+0	40	+0	+0	+0	+0
8333	+2	+2	+3	+3	+18	+19	+6	+4	+4	+4	*4
8335	+6	+5	+6	+6	+54	+55	+18	+16	+16	+16	+16
8370	to	+0	to	+0	+0	+0	+0	to	+0	+0	+0
0510	+2	+1	+0	to	+0	+0	to	+0	+0	+0	+0
8533	+0	to	+0	+0	+0	to	+6	+6	+6	+6	+6
0535	+0	to	+0	to	to	to	+0	•0	to	to	+0
8550	+5	+6	+7	+8	+8	+9	+10	+10	+10	+11	+12

FIGURE w CONTINUE

	1975										
8555	+28	+29	+34	+39	+42		+48	+48	+52	+55	+59
8557	+2	+2	+3	+4	+4	+4	+4	+5	+5	+5	+6
8563	+37	+42	+51	+58	+60	+64	+70	+71	+76	+81	+86
8581	+15	+13	+15	+17	+18	+20	+21	+22	+23	+24	+26
8582	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
8584	+70	+91	+102	+125	+146	+ 67	+216	+236	+257	+278	+300
8588	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8599	+2	+2	+3	+4	+4	+4	+4	+5	+5	+5	+6
8590	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8502	+2	+2	+3	+3	+3	+4	+	+	+1	+	+
8710	+23	+25	+27	+28	+30	+32	+33	+34	+36	+38	+40
87	+75	+85	+283	+3≤2	+ 67	+ 55	+139	+142	+148	+ 58	+166
8718	+4	+4	+5	+32	+63	+64	+7	+7	+7	+7	+8
8731	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8733	+6	+7	+8	+9	+≤2	+63	+ 4	+ 1	+ 2	+ 2	+ 3
8735	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8780	+ 3	+ 3	+34	+45	+32	+33	+21	+21	+22	+23	+24
8781	+21	+20	+20	+22	+71	+72	+29	+26	+27	+28	+30
8785	+16	+16	+17	+18	+19	+21	+23	+22	+24	+24	+25
879	+22	+24	+28	+30	+161	+164	+53	+45	+47	+49	+52
8798	+54	+61	+72	+81	+86	+93	+97	+97	+101	+104	+108
8799	+56	+58	+63	+70	+ 28	+ 33	+ 00	+ 05	+ 09	+ 3	+ 8
8702	+2	+2	+3	+3	+3	+4	+4	+4	+4	+4	+4
9 11	+32	+36	+41	+46	+48	+52	+60	+63	+67	+72	+76
9119	+7	+8	+10	+12	+12	+13	+14	+15	+16	+17	+18
9 5	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
9153	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
9155	+16	+15	+18	+19	+20	+23	+24	+25	+27	+28	+30
9173	+46	+52	+60	+67	+71	+76	+82	+85	+92	+99	+106

FIGURE 13 CONTINUED

91	41	+150	+158	+167	+174	+182	+194	+200	+209	+217	+[illegible]
9101	+5	+6	48	+10	+10	+11	+13	+13	+13	+15	..6
9102	+19	+21	+24	+27	+29	+31	+34	+35	+37	+40	+43
9315	+2	+3	+3	+4	04	+4	+5	+5	+5	+6	+6
9318	+6	+7	+8	+9	+9	+10	+10	+11	+12	+12	+13
9531	+13	+15	+17	+18	+20	+22	+23	+ 24	-26	+27	+30
9533	+13	+13	+13	+13	+14	+14	+14	+15	+15	+15	+15
9535	+5	+5	+7	+8	+8	+9	+9	+10	+11	+11	+12
9537	+3	+3	+3	+3	+3	+3	+13	+13	+13	+13	+13
9539	+2	+3	+3	+4	+4	+4	+5	+5	+5	+6	+6
5918	+173	+189	+211	+230	+250	+263	+278	+292	+310	+329	+349
TOTL	+3183	+3358	+3995	+4531	+4891	+5195	+5331	+5482	+5888	+6253	+6662

1975 1985

F GURE 3 CoN NUED

Prepared by MANFORCE RESEARCH ASSOCIATES February, 976

c. FORECAST LABOUR DEMAND

1. Demand by Community

Figure 14A following shows the amount of labour that will be required in each Mackenzie Delta community of concern under the LOW IMPACT development scenario for hydrocarbon industry activity. The general growth in labour demand for each community is apparent as the total amount of labour required increases from 2741 in 1975 to 6725 in 1985, an increase of 145% over the ten years. However, each community is itself growing at a different rate over that period. The slowest growth is exhibited by Norman Wells (50%), with the growth in Inuvik and Ft. McPherson (151% and 157% respectively) lower only than that exhibited by the CAMP (205%). Each community's development depends on the rate of growth in each industrial sector but the greatest total growth occurs where the hydrocarbon industry has the greatest influence; under this scenario that occurs in the CAMP. Inuvik receives significant benefit from hydrocarbon activities under this scenario, as does Ft. McPherson (especially in the forestry industry) but the major effect occurs in the CAMP where direct addition of hydrocarbon jobs is the greatest.

Comparing the total study growth found under each of the four conditions we can see that the movement is very similar to that found with respect to labour supply.

DRAFT ONLY

FIGURE 14A

LABOUR DEMAND BY COMMUNITY AND YEAR

-LOW IMPACT-

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	191	224	257	289	301	317	344	349	373	393	415
Inuvik	1404	1685	2151	2464	2566	2739	2932	2927	3135	3334	3527
Ft. Good Hope	46	48	52	54	59	62	65	72	73	76	82
Ft. Norman	65	71	76	81	85	88	94	96	102	107	111
Colville Lake	16	16	16	19	21	21	23	25	25	26	28
Paulatuk	27	29	32	34	35	36	38	39	40	41	43
Arctic Red River	34	34	37	40	43	45	48	50	52	57	59
Aklavik	105	123	136	152	157	166	176	178	186	196	207
Norman Wells	111	117	123	130	133	138	146	149	156	162	167
Ft. Franklin	38	42	47	49	50	54	57	58	62	64	68
Sachs Harbour	38	41	44	46	48	49	52	50	53	55	58
Ft. McPherson	147	183	23o	269	279	297	322	317	338	358	378
Camp	519	534	862	969	1118	1242	1055	1281	1373	1475	1582
TOTAL	2741	3147	4063	4596	4895	5254	5352	5591	5968	6344	6725

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

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FIGURE 14B

LABOUR DEMAND BY COMMUNITY AND YEAR

-NET IMPACT OF GAS PROCESSING PLANTS-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	0	0	2	2	1	2	2	1	1	0	1
Inuvik	0	0	103	124	123	123	50	52	51	51	50
Ft. Good Hope	0	0	0	0	0	0	0	0	0	0	0
Ft. Norman	0	0	0	0	0	0	0	0	0	0	0
Colville Lake	0	0	0	0	0	0	0	0	0	0	0
Paulatuk	0	0	0	0	0	0	0	0	0	0	0
Arctic Red River	0	0	1	0	0	0	0	0	0	0	0
Aklavik	0	0	1	0	0	1	0	0	0	0	1
Norman Wells	0	0	0	0	0	2	0	0	0	0	0
Ft. Franklin	0	0	0	0	0	0	0	0	0	0	0
Sachs Harbour	0	0	0	0	0	0	0	0	0	0	0
Ft. McPherson	0	0	13	15	14	14	7	6	5	5	6
Camp	0	0	380	.470	470	470	145	145	145	145	145
TOTAL	0	0	500	611	608	612	204	204	202	201	203

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

Prepared by MANFORCE RESEARCH ASSOCIATES February, 1976 . . . .

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FIGURE 14C

LABOUR DEMAND BY COMMUNITY AND YEAR

-NET IMPACT OF OTHER HYDROCARBON-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	63	88	112	135	140	146	162	157	170	180	188
Inuvik	293	504	828	1004	1024	1095	1285	1184	1297	1392	1474
Ft. Good Hope	5	5	5	6	7	8	8	9	10	10	11
Ft. Norman	0	2	4	4	4	4	5	3	4	4	4
Colville Lake	2	2	2	2	3	4	3	4	4	4	4
Paulatuk	1	3	5	6	5	5	6	5	6	6	6
Arctic Red River	4	4	3	5	5	6	7	7	8	8	9
Aklavik	9	24	31	41	39	39	44	40	42	44	45
Norman Wells	0	2	4	5	4	2	4	3	4	4	4
Ft, Franklin	0	2	4	5	4	4	5	3	4	4	4
Sachs Harbour	0	2	4	5	4	4	5	3	4	4	4
Ft. McPherson	36	66	93	120	123	132	157	145	160	172	181
Camp	519	534	482	499	648	772	910	1136	1228	1329	1437
TOTAL	934	1238	1541	1838	2010	2221	2602	2699	2941	3161	3371

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

Prepared by MRA MANFORCE RESEARCH ASSOCIATES February, 1976 . . .

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FIGURE 14D

LABOUR DEMAND BY COMMUNITY AND YEAR

-NO HYDROCARBON-

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	128	136	143	152	160	169	180	191	202	213	226
Inuvik	1111	1181	1256	1336	1419	1521	1597	1691	1787	1891	2003
Ft. Good Hope	41	43	47	48	52	54	57	63	63	66	71
Ft. Norman	65	69	72	76	81	84	89	93	98	103	107
Colville Lake	14	14	14	17	18	17	20	21	21	22	24
Paulatuk	26	26	27	28	30	31	32	34	34	35	37
Arctic Red River	30	30	33	35	38	39	41	43	44	49	50
Aklavik	94	99	104	111	118	126	132	138	144	152	161
Norman Wells	111	115	119	125	129	134	141	146	152	158	163
Ft. Franklin	38	40	43	44	46	50	52	55	58	60	64
Sachs Harbour	38	39	40	41	44	45	47	47	49	51	54
Ft. McPherson	111	117	124	134	142	151	158	166	173	181	191
Camp	0	0	0	0	0	0	0	0	0	0	0
	1807	1909	2022	2147	2277	2421	2546	2688	2825	2981	3151

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

Prepared by MANFORCE RESEARCH ASSOCIATES February, 1976 . . . .

Total labour demand under the LOW IMPACT case increases by 3984 persons over the forecast period with 203 persons contributed by the gas plants, 2437 induced by other hydrocarbon industry activity, and 1344 attributable to normal growth without hydrocarbon activity.

If we accept the point that much of the labour supply increase is demand induced we can compare the responses in each sector and determine the overall effect of labour supply and demand movements under the LOW IMPACT case (see Figure 15).

By calculating the difference between labour demand and labour supply we find that under the LOW IMPACT case the labour supply grows more than does labour demand over the forecast period. This is due to the high excess demand during construction periods and the inability of labour supply to respond quickly to major decreases in demand. When dealing with components it can be seen that labour demand grows most with respect to the influences of normal growth and the gas plants, while labour supply growth outstrips increase in labour demand in the OTHER HYDROCARBON sector illustrating the occupational imbalances that are present which account for internal fluctuations.

Overall, the net effect of the gas processing plants is to increase labour demand over the forecast period but it is important to note that the increases are much more significant during the four years of gas plant construction with major reductions in demand during the operational phase.

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FIGURE 15

TOTAL LABOUR SUPPLY AND DEMAND POSITIONS
UNDER THE LOW IMPACT CASE

COMPONENTS	CHANGE IN LABOUR MARKET VARIABLES		
	LABOUR SUPPLY	LABOUR DEMAND	CHANGE
Low Impact	4062	3984	78
Due to Gas Plants	165	203	38
Due to Other Hydrocarbon	2664	2437	227
Due to Normal Growth	1233	I 344	I I I

As with labour supply, labour demand is concentrated in the major communities in this component with very minor changes in the other Delta areas.

This situation changes when considering the OTHER HYDROCARBON component as each community receives a share of the increased labour demand but the greatest increases are again found in the major communities. This again falls in line with the situation found regarding labour supply, as expected. A more consistent growth is found in this component as well , indicating the result of removing the highly variable demand positions of the gas processing plants.

Under the condition of NO HYDROCARBON we see the same type of consistent growth as found under the OTHER HYDROCARBON component with the differences being that an even more consistent pattern of increase is found here. This again is as expected as a result of the removal of yet another highly variable labour demand component, namely the CAMP numbers.

2. Demand by Occupation

The occupational distribution of labour demand under the LOW IMPACT case is provided in Figure 16 following.

OCCUPATIONAL ANALYSIS

To be provided in Stage Two of this report.

FIGURE 16

LABOUR DEMAND BY OCCUPATION

-LOW IMPACT-

	1975										1985
1111	+5	+5	+5	+5	+6	+6	+6	+7	+7	+7	+8
1113	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1115	+4	+5	+5	+5	+6	+6	+6	+7	+7	+7	+8
1131	+3	+4	+7	4'9	+9	*lo	49	49	+10	+11	+11
1135	+9	+12	+23	+27	+29	+31	+30	+30	+32	+34	+37
1137	+5	+6	+8	+9	+9	+10	+10	●10	+11	+11	+12
1142	+3	+3	+4	44	+5	+5	+5	+5	+6	+6	+6
1143	+6	+7	+10	+12	+12	+13	+12	+12	+13	+14	+14
1147	+17	+19	+34	+36	+38	+40	+43	+44	+47	+49	+52
1171	+9	*11	+18	+20	+21	+24	+23	+23	+25	+27	+29
1174	+4	+5	+5	+5	+6	+6	+8	+9	+9	+9	+10
1179	+16	+18	+22	+25	+26	+28	+28	+29	431	+33	+35
1102	+4	+4	+6	+6	+7	+8	+8	+8	+8	+8	+10
2135	+2	+2	+2	+2	+3	+3	+3	●3	+3	+3	●U
2154	+18	+18	+18	+17	+17	+17	+17	+17	●17	+17	+16
2161	+97	+93	+38	+43	+49	+55	+92	+83	+71	+77	+83
2165	+33	+36	+40	+42	+46	+49	+72	+87	+93	+95	+98
2311	+3	+3	+4	+4	+5	45	+5	+5	+6	+6	+6
2319	+9	+14	+26	●33	+34	+36	+35	+34	+38	+41	+44
2331	+0	+0	+0	+0	+0	+0	+0	+0	40	+0	to
2333	+5	+5	+5	+5	+6	+6	+6	+7	+7	+7	*R
2343	40	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2349	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
2511	+5	45	+6	+6	+8	+8	+8	+8	+9	+9	+10
2731	+10	*12	+13	+14	+16	+17	+17	+18	+19	+20	+21
2733	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2797	to	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2799	+18	+20	+24	+25	+27	+29	+29	+31	+32	+34	+36

313U	+2	+2	+0	+0	40	0	+2	+1	+0	+0	+0
3135	+8	+8	+9	+9	+11	+11	+12	+13	+13	+13	+14
3139	+7	+7	+5	45	+6	+6	+6	+7	+7	+7	+8
3102	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3313	+5	+6	+8	+9	+9	+10	+10	+10	+11	+11	+12
3337	+9	+11	+13	+13	+15	+16	+16	+17	+18	419	421
3355	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3301	+2	+2	+4	+4	+4	+5	45	+5	+5	+5	+6
3710	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	40
3715	+2	+2	+2	+2	+3	43	+3	+3	+3	43	+4
3719	+31	+26	+13	+16	+17	+18	+33	+26	+19	+20	+22
4111	+54	+59	+79	+90	+99	+110	+123	+130	+141	+151	+161
4113	+11	+13	+15	+15	+16	+18	+18	+19	+19	+21	+22
4130	+7	+8	+12	+14	+14	+15	+15	+15	+16	+17	+18
4131	45	45	+6	+6	+7	+8	+14	+14	414	+15	+16
4133	+21	+29	+46	+56	+58	+61	+60	460	+66	+70	+75
4135	+10	+14	+26	+33	+34	+36	●35	+34	+38	+41	+44
4151	*0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4153	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	+3
4155	+61	+69	+87	497	+104	4110	+115	+118	+126	+134	+142
4159	+2	+2	+4	+4	+4	+5	+5	+5	+5	+5	+6
4169	+20	+23	+28	+31	+33	+35	+36	+38	+41	+44	+46
4170	+2	43	+4	+4	+4	+5	+5	+5	+5	+6	+6
4171	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
4173	●10	+10	+11	+11	+12	+13	413	+14	414	+15	+16
4175	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	+6
4190	+23	+24	+28	+30	+31	+34	+35	+36	+38	+39	●Q2
4191	+2	+2	+4	+4	+4	+5	+5	+5	+5	+5	+6
4193	+7	+7	+0	+8	+9	+10	+11	+11	+11	+12	*13

FIGURE 16 CONTINUED

1975

											1980
4197	+26	+32	+46	●52	+57		+59	+60	+65	+68	+74
4199	+24	+23	+26	+27	+28	+31	+31	+33	+34	+36	+38
5130	+41	+44	449	+56	+58	+62	+69	+68	+67	+71	+75
5135	+2	+2	+4	+4	44	*5	+5	+5	+5	+5	+6
5137	+73	+65	4114	+130	+136	+145	+145	+147	+158	+168	+177
5177	+20	+30	+40	+50	+60	+70	+80	+90	+100	+110	4120
5101	+5	+6	+8	+9	+9	+10	+10	+10	+11	+11	+12
5102	+5	+6	+8	+9	+9	+10	+10	+10	+11	+11	+12
6111	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
6112	+0	+0	+0	+0	+0	to	+0	+0	to	+0	+0
6115	+5	+5	+5	+5	+6	+6	+6	+7	+7	+7	●8
6120	+6	+7	+8	+9	+10	+11	+11	+11	+12	+13	+13
6121	+64	+69	●80	+86	+89	+95	+100	+103	+107	+113	+118
6123	+21	+24	+30	+34	+36	+38	+39	+40	+42	+45	+48
6125	+70	+79	+101	+112	+118	+126	+128	+131	+139	+148	+158
6129	+3	+3	+4	+4	45	*5	+5	+5	+6	+6	+6
6130	+7	+8	+9	+9	+11	+11	+11	+12	+13	+13	+14
6133	+18	+21	+26	+29	+31	+33	+33	+34	+36	+39	+41
6139	+35	+36	+37	+39	+46	+41	+49	+50	*51	+53	+54
6144	+2	+2	+2	+2	+3	+3	+3	+3	+3	+3	+4
6147	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6149	+6	+6	+5	+5	+6	+6	+6	+7	+7	*7	+8
6160	+6	+7	+8	+9	+10	+11	411	+11	+12	+13	+13
6161	+7	+8	+12	+14	+16	+17	+16	+16	+18	+19	+21
6165	+6	+7	+8	+9	+10	+11	+11	+11	+12	+13	+13
6191	+60	+68	+83	+90	+97	+103	+102	+106	●113	+119	+126
6190	+98	+111	+150	+169	+176	+188	+191	+196	+207	+221	+234
6101	+7	+8	+8	+8	+9	+9	+9	+10	+10	+10	+11
6102	+5	+5	+5	+5	+6	+6	+6	+7	+7	+7	+8

FIGURE 6 CONTINUED

	1975										19(
7313	+2	+1	+1	+1	+1	1	+1	+1	+2	+2	+2
7315	+119	+95	+77	+77	479	+81	+90	+89	+86	+86	+91
7511	+16	+17	+19	+20	+21	+22	+23	+24	+25	+27	+28
7513	+23	+40	+90	+113	+117	+123	+115	+109	+118	+126	+133
7710	+28	+33	+38	+42	+47	+52	+71	+68	+81	+86	+90
7711	+278	+343	+405	+468	+531	+595	+674	+714	+800	+864	+926
7713	+23	+28	433	+38	+43	+49	454	+59	+64	470	+75
7715	+44	+34	+30	+33	+38	+41	+45	+48	+53	+56	+60
7718	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7719	+38	+46	+55	+64	+72	+81	+90	+99	+107	+116	+125
7701	+45	+39	+3	+3	+3	+3	+21	+14	+3	+3	+3
7702	+241	+107	46	46	+7	+7	429	+21	+7	+7	47
8160	0	+0	+0	+0	+0	+0	+8	+8	+8	+8	+8
8165	+6	+6	+6	+6	+7	+7	+23	+23	+23	+23	+23
8176	+0	+0	+0	+0	+0	+0	+3	+3	+3	+3	+3
0231	47	+8	+13	415	+16	+18	+17	+17	+18	+19	+21
8238	43	+4	+7	+9	+9	+10	+9	+9	+10	+11	+11
8295	+23	+27	+36	+42	+43	+46	+46	+47	+50	+53	+56
8311	+0	+0	+0	+0	+0	40	+0	to	+0	+0	+0
8313	to	+0	+0	to	+19	+19	+0	+0	+0	+0	40
8315	+0	+0	+0	+0	40	+0	+0	+0	+0	+0	+0
0319	+0	+0	+0	to	+0	+0	+0	+0	+0	to	+0
8333	+2	+2	+3	+3	+19	+19	+9	+5	+4	+4	+4
8335	+6	+5	46	+6	+55	455	+28	+18	+16	+16	t16
8370	+0	+0	+0	+0	+0	+0	to	+0	+0	+0	+0
8510	+2	41	+0	40	to	+0	+0	+0	+0	+0	+0
8533	+0	+0	+0	+0	+0	+0	46	+6	+6	+6	+6
8535	+0	+0	+0	+0	to	+0	+0	to	+0	+0	to
0550	+5	+6	48	+9	+9	+10	+10	+10	+11	+11	+12

FIGURE 16 CONTINUED

	1975										19[illegible]
8555	+28	+29	+38	+44	+46	?	450	+51	+53	+56	+60
8557	+2	+2	+4	+4	+4	+5	+5	+5	+5	+5	46
8563	+37	+42	+57	+65	+68	+72	+72	+73	+78	+83	+88
8581	+15	+13	+17	+19	+21	+22	+22	+22	+23	+24	426
8582	+2	+3	+4	+4	+4	+5	+5	+5	45	+6	+6
8584	+70	+91	+105	+126	+147	+171	+228	+249	+257	4279	+300
8588	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8599	+2	+2	+4	+4	+4	+5	+5	+5	45	+5	46
8590	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8502	+2	+2	+3	+3	+4	+4	+11	+11	411	+11	+11
8710	+23	+25	+27	+29	+30	+32	+33	+35	436	+38	+40
8711	+75	*P5	+289	+328	+163	*161	+140	+144	4152	4159	+168
8718	+4	+4	+5	+32	+64	+64	+7	+7	47	+7	+8
8731	+0	+0	40	+0	+0	+0	+0	+0	+0	+0	+0
8733	+6	+7	+8	+9	+63	+64	+28	•1U	412	+13	+13
8735	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8780	+13	*13	+35	445	+33	+34	+25	+23	+22	+23	+24
8781	+21	•2C	+22	+22	+72	+74	+42	+29	+28	+28	+30
8785	+16	+16	+18	+19	+21	+23	+25	+24	+24	+25	+25
8791	+22	+24	+30	+32	+165	+166	+84	*51	t47	+49	+52
8798	+54	+61	+77	+87	+93	+99	+98	+99	+103	+106	+109
8799	+56	+58	+68	+75	+134	+138	+113	+108	+111	+114	*119
8702	+2	42	+3	+3	*4	+4	+4	+4	+4	44	+4
9111	+32	+36	+44	+49	+52	+55	+61	+64	468	473	+77
9119	+7	+8	+12	+14	+14	+15	+15	+15	+16	+17	+18
9151	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	46
9153	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	+6
9155	+16	+15	+19	+20	+23	+24	+25	+25	+27	+29	+30
9173	+46	+52	+64	+71	+76	+81	+84	+87	+94	*100	+107

FIGURE 6 CONTINUED

FIGURE 16 CONTINUED

	1975										1984
9179	1141	+150	+160	+169	+176	+14	+ 94	+201	+210	+218	+226
9 0	+5	+6	+10	+12	+12	+14	+ 3	+13	+14	+16	+ 7
[illegible]	+ 9	+21	+26	+28	+3	+33	+34	+35	+38	+40	+44
9315	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	+6
9318	+6	+7	+8	+9	+ 0	+11	+11	+1	•12	+ 3	+ 3
9531	+1	+15	+18	+19	+22	+2	+24	+24	+26	+28	+30
953	+ 3	+13	+1	+13	+14	+14	+ 4	+ 5	+15	+ 5	+ 5
9535	+5	+5	+8	+8	9	+10	+1	+1	+11	+11	+12
9537	+3	+3	+3	+3	+3	+3	+13	+	+ 3	+ 3	+ 3
9539	+2	+3	+4	+4	+4	+5	+5	+5	+5	+6	+6
991	+173	+189	+22	+237	+258	+272	+2	+294	+313	+331	+35
TOTL	+3183	+3358	+4247	+4773	+5158	+5493	+5595	+5670	+5975	+6333	+6726

D. PARTICIPATION RATES

1. General

The concept of participation rates in most common usage indicates that these rates are an expression of that proportion of an area population which is either employed or unemployed and seeking work.[6] This is the way those rates are used in southern Canada and most other developed areas but for the Northwest Territories, and specifically with respect to the Mackenzie Delta; some adjustment to the definition and consequently to the usage and interpretation of these rates is in order.

In view of the small size of the Delta labour force and its relative staticness and captive[7] nature, the dynamics of this group are somewhat different from that found with their counterparts in other areas. In larger, more fluid labour force environments the amount of frictional and structural unemployment is much greater than that found in Delta communities. This is mainly due to the fact that the economy in Delta locations is much more closely tied to the nature of its residents, or vice versa, while in other areas the shifting of employment and the mismatching of skills and experience leads to a significant level of

---

[6] TERIS does not require that a person be activity seeking work to be unemployed but rather only requires that the respondent has been employed at some time in the past.

[7] Used to indicate the isolation of labour force groups by virtue of the isolation of the communities.

employment mismatching. Changing from job to job and alterations in component labour supply is a constant force in large centres but is much less a factor in Delta communities.

There is, however, a much greater compliance to outside experience with respect to the response of participation rates to unemployment levels, and resultantly to labour supply and demand adjustments. In both cases an increase in labour demand, with respect to labour supply and the coincidental decrease in unemployment values, causes an increase in participation rates. The difference appears though in the magnitude of the adjustments. Data provided by TERIS indicates that, in general, as unemployment falls by one point participation rates increase by approximately one half point, and vice versa.

As a response to unemployment fluctuations, this change in participation rate is very high compared to that experienced in other parts of Canada, but barring any drastic inaccuracies in the basic data is not an unrealistic situation. The reason for this rapid response of participation rate to unemployment rate changes is due, we bel ieve, to the fact that unemployed Delta residents tend more to move out of the labour force when unemployed rather than continuing to seek work. They realize that if there are no jobs for them at one point in time the situation is not likely to improve with extended job searches so they discontinue seeking work until more employment develops. The lack of frictional and

structural unemployment removes much of the fluid nature of labour markets and makes increased development a much more important employment provider. Vacancies are less likely to arise from redistribution of the same number of positions under Delta conditions than would be the case in other areas.

2. Implications

In view of the different dynamics of the labour market in Delta communities, the participation rate has been used in a fashion that is much more closely linked to labour demand conditions. As a result, the unemployment rates used in this study have been adjusted so that they will represent more accurately the number of persons actually seeking work and will reduce the effect of those persons classed as unemployed but who should actually be placed in the category, "Not in the Labour Force".

Under the LOW IMPACT case we see that the greatest change in rate of participation is found in those major communities most closely linked to the hydrocarbon industry. Although Inuvik has the highest absolute levels of participation, the greatest rate changes are found in the smaller communities of Tuktoyaktuk, Ft. McPherson, and Aklavik. Of course, Inuvik receives the major portions of direct and secondary hydrocarbon industry activity but this activity contributes less to the change in participation rates there than it does in other areas.

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FIGURE 17A

PARTICIPATION RATES BY COMMUNITY AND YEAR

-LOW IMPACT-

	YEAR										
COMMUNITY	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	52	58	62	65	65	65	68	66	67	67	66
Inuvik	82	86	88	86	85	86	87	85	82	82	80
Ft. Good Hope	22	23	26	27	29	31	31	34	35	37	41
Ft. Norman	46	49	51	54	56	57	59	60	62	63	62
Colville Lake	41	41	41	49	54	54	59	65	58	58	57
Paulatuk	61	62	62	62	61	60	62	61	62	62	63
Arctic Red River	43	43	46	50	52	53	56	57	55	58	56
Aklavik	25	29	32	35	35	36	38	38	39	40	42
Norman Wells	56	57	58	59	58	59	60	59	59	58	57
Ft. Franklin	29	31	33	34	35	36	38	38	40	41	43
Sachs Harbour	43	44	46	46	48	48	50	46	47	48	49
Ft. McPherson	34	43	50	56	56	57	60	56	56	56	55

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

The reason for this is that, first, Inuvik hosts a much wider variety of activity so that growth in any one area is less significant in total; and second, the general participation rate in Inuvik is nearer to the maximum practical upper limit, thus allowing for less movement upwards.

In all communities significantly affected by hydrocarbon industry activity the participation rate reaches its highest levels during the construction end/operations start phase, with a slight downturn during the following operational years. Due to the location of construction crews away from the communities, we can see that the operations and maintenance activity is of greater importance to participation rate levels. This predominant effect would be changed significantly if the construction personnel were to be located in the communities. Also, participation rates for the CAMP have not been included in the tables as a result of our limiting assumption that commuting (CAMP) employees are present for the sole purpose of working; thus they cannot become unutilized labour force members by definit ion.

Looking at the effect of the gas processing plants alone in the participation rates (Figure 17B) we see that only minor changes result.[8] The changes are restricted, of course, to those communities affected by hydrocarbon activity, but in this area the effect includes relocation to employment as

[8] Figures 17B and 17C represent the change in the participation rate due to each activity.

well as local activity. Thus, the decrease in the participation rate in Ft. Franklin is due to the out-migration of persons from that area to take jobs in the hydrocarbon industry elsewhere. One caution though, is that the very small numbers involved in these areas are in some cases over-significant due to the small labour forces involved; another reason for dealing with indicated trends rather than specific countings.

Again, as with the total case, we find that gas plant operational activity contributes more significantly to adjustments in the participation rates than does construction. Still, the changes are small which indicates the minimal labour market influences of that hydrocarbon development as the Proponents have outlined it.

When dealing with the effect of the OTHER HYDROCARBON component (Figure 17C) we can clearly see that this activity is a major labour market force in most communities. In fact, in those smaller communities affected it is the single most important determinant of labour force participation. In Inuvik the effect is much less pronounced which again illustrates the greater diversity of activity in that community. Overall, the rates do rise to peaks during end construction/start operations period and then drop slightly but the higher levels found tend to temper somewhat the fluctuations.

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FIGURE 17B

PARTICIPATION RATES BY COMMUNITY AND YEAR

-NET IMPACT OF GAS PROCESSING PLANTS-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	0	0	0	-1	0	0	2	1	2	2	1
Inuvik	0	0	0	0	1	2	5	1	0	1	0
Ft. Good Hope	0	0	0	0	0	0	0	0	0	0	0
Ft. Norman	0	0	0	0	0	0	0	0	0	0	0
Colville Lake	0	0	0	0	0	0	0	3	3	3	2
Paulatuk	0	0	0	0	0	0	0	0	0	0	0
Arctic Red River	0	0	0	0	0	0	2	3	1	1	1
Aklavik	0	0	0	0	0	0	0	0	0	0	0
Norman Wells	0	0	-1	-1	-1	0	1	1	1	0	0
Ft. Franklin	0	0	-1	-1	0	0	0	0	0	0	0
Sachs Harbour	0	0	0	0	0	0	0	0	0	0	0
Ft. McPherson	0	0	1	1	1	1	3	2	2	2	2

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

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FIGURE 17C

PARTICIPATION RATESBY COMMUNITY AND YEAR

-NET IMPACT OF OHTER HYDROCARBON-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	14	20	23	27	25	25	25	23	22	21	19
Inuvik	9	12	14	11	7	6	3	4	1	-1	-4
Ft. Good Hope	3	4	6	7	9	10	11	12	13	14	15
Ft. Norman	0	2	4	6	7	6	7	6	7	6	6
Colville Lake	6	6	6	6	8	8	8	9	6	0	6
Paulatuk	1	5	7	8	8	7	10	9	11	0	10
Arctic Red River	5	7	5	8	6	7	8	7	7	-3	5
Aklavik	3	7	11	13	13	13	15	15	16	-1	16
Norman Wells	0	1	3	4	3	3	3	2	2	0	1
Ft. Franklin	1	-3	6	7	7	8	10	10	12	-1	14
Sachs Harbour	0	2	5	5	4	5	6	4	4	-1	4
Ft. McPherson	9	17	23	28	27	27	28	24	24	23	21

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

Under the NO HYDROCARBON scenario the participation rates are either stable or increasing for every community over the forecast period.[9] The major difference between this case and any of the others dealt with is that all the changes here are much more consistent and regular than there are under other conditions. There are no significant peaks and troughs so that change is occurring at normal, regular rates. These facts represent the positions which would be expected if the Delta economy were left to grow at its own rate without the influence of the fluctuating conditions found with respect to hydrocarbon industry activity. This situation may be a case for normal growth in that regularity, with its absences of pockets of unemployment and pressures of excess demand, is an attractive alternative.

An important point to note that Inuvik's participation rate at the end of the forecast period under the NO HYDRO-CARBON case is actually higher than that found for the same point under the LOW IMPACT case. Of course this does not mean that employment is better with the higher rate as it could indicate changes in unemployment, but it does indicate that consistent normal growth can lead to high levels of participation.

[9] Paulatuk actually declines but this may be due to data problems and the small numbers involved.

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FIGURE 17D

PARTICIPATION RATES BY COMMUNITY AND YEAR

-NO HYDROCARBON-

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	38	38	39	39	40	40	41	42	43	44	46
Inuvik	73	74	74	75	77	78	79	80	81	82	84
Ft. Good Hope	19	19	20	20	20	21	20	22	22	23	26
Ft. Norman	46	47	47	48	49	51	52	54	55	57	56
Colville Lake	35	35	35	43	46	46	51	51	49	49	49
Paulatuk	60	57	55	54	53	53	52	52	51	52	53
Arctic Red River	38	36	41	42	46	46	46	47	47	51	50
Aklavik	22	22	21	22	22	23	23	23	23	24	26
Norman Wells	56	56	56	56	56	56	56	56	56	56	56
Ft. Franklin	28	28	28	28	28	28	28	28	28	28	29
Sachs Harbour	43	42	41	41	44	43	44	42	43	44	45
Ft. McPherson	25	26	26	27	28	29	29	30	30	31	32

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

E. HYDROCARBON EMPLOYMENT

1. Employed by Community

The employment levels found in the hydrocarbon industry under the LOW IMPACT case are indicated by the entries found in Figure 18A. Figures 18B and 18C show that position of the LOW IMPACT levels contributable to the GAS PROCESSING PLANTS, and OTHER HYDROCARBON respectively. There would be no entries under the NO HYDROCARBON scenario.

The figures under the LOW IMPACT case are derived by summing all hydrocarbon employment according to current estimates, adding the specific employment related to gas plant construction and operation, and including amounts for growth in the other hydrocarbon industry components. As such, this case outlines Delta hydrocarbon industry employment as it is expected to appear if the gas plant proponents carry out their development activities as currently intended. Under those conditions it can be easily seen that the greatest single amount of hydrocarbon employment would in the CAMP. In fact, approximately 65% of all hydrocarbon positions would be filled by southern commuters.

Constant growth is experienced in most areas with the largest communities and the CAMP again taking the largest shares. The effect of construction activity, although significant, is kept from producing a bulge in earlier years by the inclusion of all hydrocarbon industry activity.

FIGURE 18A

EMPLOYED IN THE HYDROCARBON INDUSTRY
BY COMMUNITY AND YEAR

-LOW IMPACT-

	YEAR										
COMMUNITY	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	61	83	104	124	128	133	146	142	153	161	169
Inuvik	145	218	377	458	455	467	498	457	489	518	54o
Ft. Good Hope	5	5	5	6	7	8	8	9	10	10	11
Ft. Norman	0	2	4	5	4	4	5	3	4	4	4
Colville Lake	2	2	2	2	3	3	3	4	4	4	4
Paulatuk	1	3	5	6	5	5	6	5	6	6	6
Arctic Red River	4	4	4	5	5	6	7	7	8	8	9
Aklavik	11	23	30	39	37	37	41	37	39	41	42
Norman Wells	0	2	4	5	4	4	5	3	4	4	4
Ft. Franklin	0	2	4	5	4	4	5	3	4	4	4
Sachs Harbour	0	2	4	5	4	4	5	3	4	4	4
Ft. McPherson	17	28	37	46	45	46	51	47	50	53	55
Camp	519	534	862	969	1118	1242	1055	1281	1373	1474	1532
TOTAL	765	908	1442	1675	1819	1963	1835	2001	2148	2290	2434

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

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FIGURE 18B

EMPLOYED IN THE HYDROCARBON INDUSTRY
BY COMMUNITY AND YEAR

-NET EFFECT OF GAS PROCESSING PLANTS-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyaktuk	0	0	0	0	0	0	0	0	0	0	0
Inuvik	0	0	10	10	10	10	10	10	10	10	10
Ft. Good Hope	0	0	0	0	0	0	0	0	0	0	0
Ft. Norman	0	0	0	0	0	0	0	0	0	0	0
Colville Lake	0	0	0	0	0	0	0	0	0	0	0
Paulatuk	0	0	0	0	0	0	0	0	0	0	0
Arctic Red River	0	0	0	0	0	0	0	0	0	0	0
Aklavik	0	0	0	0	0	0	0	0	0	0	0
Norman Wells	0	0	0	0	0	0	0	0	0	0	0
Ft. Franklin	0	0	0	0	0	0	0	0	0	0	0
Sachs Harbour	0	0	0	0	0	0	0	0	0	0	0
Ft. McPherson	0	0	0	0	0	0	0	0	0	0	0
Camp	0	0	380	470	470	470	145	145	145	145	145
TOTAL	0	0	390	480	480	480	155	155	155	155	155

Source: Information supplied by Proponents and Manforce Research Associates.

This is illustrated more clearly when the GAS PLANT and OTHER HYDROCARBON components are considered.

The specific effect of the gas processing plants is clearly shewn in Figure 18B. The ten operational positions in Inuvik and the construction and operation positions placed in the CAMP indicate the magnitude and timing of the effects. This figure shows how localized the effect of the gas plants is and how the greatest majority of the activity is located outside of the communities.

The last figure in this series (18C) identifies that portion of the LOW IMPACT hydrocarbon employment which is provided by OTHER HYDROCARBON activity. The fact that this component comprises the bulk of total hydrocarbon employment is clearly illustrated. Also, the consistent pattern of growth which overrides the more sporadic influence of the gas plants is as well outlined. Growth in each community is normal over the forecast period, with the CAMP and Inuvik respectively accounting for the largest changes.

2. Employed by Occupation

The occupational distribution of hydrocarbon industry employment under the LOW IMPACT case is provided in Figure 19 following.

OCCUPATIONAL ANALYSIS

To be provided in Stage Two of this report.

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FIGURE 18c

EMPLOYED IN THE HYDROCARBON INDUSTRY
BY COMMUNITY AND YEAR

-NET EFFECT OF OTHER HYDROCARBON-

	YEAR										
	1	2	3	4	5	6	7	8	9	10	11
Tuktoyatuk	61	83	104	124	128	133	146	142	153	161	169
Inuvik	145	218	367	448	445	457	488	447	479	508	530
Ft. Good Hope	5	5	5	6	7	8	8	9	10	10	11
Ft. Norman	0	2	4	5	4	4	5	3	4	4	4
Colville Lake	2	2	2	2	3	3	3	4	4	4	4
Paulatuk	1	3	5	6	5	5	6	5	6	6	6
Arctic Red River	4	4	4	5	5	6	7	7	8	8	9
Aklavik	11	23	30	39	37	37	41	37	39	41	42
Norman Wells	0	2	4	5	4	4	5	3	4	4	4
Ft. Franklin	0	2	4	5	4	4	5	3	4	4	4
Sachs Harbour	0	2	4	5	4	4	5	3	4	4	4
Ft. McPherson	17	28	37	46	45	46	51	47	50	53	55
Camp	519	534	482	499	648	772	910	1136	1228	1329	1437
TOTAL	765	908	1052	1195	1339	1483	1680	1846	1993	2135	2279

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

FIGURE 19

EMPLOYED IN THE HYDROCARBON INDUSTRY
BY OCCUPATION AND YEAR

-LOW IMPACT-

	YEAR										
CCDO	1	2	3	4	5	6	7	8	9	10	11
1111											
1113											
1115											
1131											
1135											
1137											
1142											
1143											
1147			10	10	10	10	12	12	12	12	12
1171											
1174							2	2	2	2	2
1179											
1102											
2135											
2154	18	18	18	17	17	17	17	17	17	17	16
2161	23	28	33	33	43	49	54	59	64	70	75
2165	33	36	40	42	46	49	72	87	93	95	98
2311											
2319											
2331											
2333											
2343											
2349											
2511											
2731											
2733											
2797											
2799											
3131											
3134											
3135											
3139											
3102											
3313											
3337											
3355											
3301											
3710											
3715											
3719											
4111	10	15	20	25	30	35	50	55	60	65	70
4113											

FIGURE 19 CONTINUED

CCDO	YEAR 1	2	3	4	5	6	d l - - 9 . 1 J 2 . 1 - l -				
4130											
4131							6	6	6	6	6
4133											
4135											
4151											
4153											
4155							3	3	3	3	3
4159											
4169											
4170											
4171											
4173											
4175											
4190											
4191											
4193											
4194											
4197											
4199											
5130											
5135											
5137											
5177	20	30	40	50	60	70	80	90	100	110	120
5101											
5102											
6111											
6112											
6115											
6120											
6121	35	36	37	39	40	41	46	47	48	50	51
6123											
6125											
6129											
6130											
6133											
6139	35	36	37	39	40	41	49	50	51	53	51+
6144											
6147											
6149											
6160											
6161											
6165											
6191											
6198	26	27	29	30	31	33	37	39	40	42	43

FIGURE 19 CONTINUED

CCDO	YEAR 75	76	77	78	79	80	81	82	83	84	85
6101											
6102											
7102											
7313											
7315											
7511											
7513											
7710	28	33	38	42	47	52	71	76	81	86	90
7711	278	343	405	468	531	595	674	737	800	864	926
7713	23	28	33	38	43	49	54	59	64	70	75
7715	15	18	22	25	29	32	36	39	43	46	50
7718											
7719	38	46	55	64	72	81	90	99	107	116	125
7701											
7702											
8160							8	8	8	8	8
8165							16	16	16	16	16
8176							3	3	3	3	3
8231											
8238											
8295											
8311											
8313					19	19					
8315											
8319											
8333					15	15					
8335					48	48	8	9	9	9	9
8370											
8510											
8533							6	6	6	6	6
9535											
8550											
8553											
8555											
8557											
3563											
8581											
8582											
8584	39	60	80	100	120	140	134	206	226	246	266
8588											
8599											
8590											
8502							7	7	7	7	7
8710											
8711	8	9	196	225	42	44	21	23	24	26	28
8718				27	57	57					

FIGURE 19 CONTINUED

	YEAR										
CCDO	75	76	77	78	79	80	81	82	83	84	85
8731											
8733					53	53					
8735											
8780			20	29	15	15	1	2	2	2	2
8781					48	48					
8785											
8791					129129			7	7	7	7	7
8798											
8799					53		53		12	19	19	19	19
8702											
9111							4	4	4	4	4
9119											
9151											
9153											
9155											
9173											
9175			185	212	15	15					
9179	121	127	132	138	143	149	158	163	169	174	180
9101											
9102											
9315											
9318											
9531											
9533											
9535											
9537							10	10	10	10	10
9539											
9918	15	18	22	25	29	32	36	39	43	46	50
TOTAL											

F. UNEMPLOYMENT

1. General

Whenever there is concern expressed with regard to employment levels or directions, the real problem to be solved is unemployment. Whether in absolute terms or in components, such as location, occupation, or specific target groups, the main task is usually to reduce both the absolute levels and the fluctuations in unemployment.

With our study of the impact of gas plant developments on employment in the Mackenzie Delta we have not attempted to reduce the level of unemployment. That would be the task of an optimization model process which is beyond the scope of this present study. Rather, we have attempted to identify the differing levels of unemployment expected under the development scenarios dealt with.

The ideal position would be to deal with unemployment by occupation for each community and look at each scenario under that light, but such an approach would require much more detailed data than we were able to obtain. Instead we have looked at unemployment by community and then dealt with occupational imbalances with respect to employment under those scenarios, a more reasonable approach given the noted constraints.

2. Implications

In the LOW IMPACT case, unemployment is at consistent levels for most communities with the smallest communities

FIGURE 20A

UNEMPLOYED AND UNEMPLOYMENT RATE BY COMMUNITY AND YEAR

-LOW IMPACT-

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %	# %
Tuktoyaktuk	+6/3	+2/0	-1/0	-7/2	-5/1	-8/2	-8/2	-10/2	-10/2	10/2	-13/3
Inuvik	-4/0	-41/2	-19/0	-46/1	-62/2	-91/3	-119/4	-49/ 1	+1/0	+57/1	+89/2
Ft. Good Hope	-5/12	-5/11	-3/6	-3/5	-3/5	-4/6	-3/4	-3/4	-2/2	-2/2	-1/1
Ft. Not-man	+4/5	+3/4	+2/2	+2/2	+2/2	+1/1	-1/1	+0/0	-1/0	-1/0	-2/1
Colville Lake	-1/6	-1/6	+0/0	+0/0	+0/0	+0/0	+0/0	+1/3	-1/4	+0/0	+0/0
Paulatuk	+0/0	+1/3	+0/0	+0/0	+0/0	+1/2	+1/2	+1/2	+1/2	+1/2	+1/2
Arctic Red River	-1/3	-1/3	-1/2	+0/0	-1/2	-1/2	+0/0	+0/0	-1/1	+0/0	-1/1
Aklavik	-7/7	-7/6	-5/3	-4/2	-5/3	-6/3	-3/1	-2/1	-2/1	-4/2	-3/1
Norman Wells	-1/0	-2/1	-1/0	-2/1	-2/1	-1/0	-1/0	-1/0	-2/1	-3/1	-3/1
Ft. Franklin	+11/22	+9/17	+8/ 14	+7/12	+8/ 13	+6/10	+7/10	+6/9	+6/8	+6/8	+5/6
Sachs Harbour	+0/0	-1/2	+0/0	-1/2	+0/0	+0/0	+0/0	+0/0	-1/1	+0/0	-1/1
Ft. McPherson	-8/5	-2/1	-4/1	-1/0	+1/0	-1/0	+2/0	-2/0	-2/0	+0/0	+1/0

+Unemployed -Vacancies

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

showing a gradual decline in unemployment. In the larger and more closely hydrocarbon related communities, however, the situation is one of negative unemployment (more jobs than workers) in the first part of the forecast period with a gradual movement towards or slightly above zero unemployment. High labour demand during the construction periods accounts for most of the negative unemployment in the earlier years with the reduction of construction and the lower labour demand condition of gas plant operation, accounting for the movement towards zero unemployment or slight positive unemployment. As well, the inter-community movement of the labour force in response to supply and demand changes accounts for the remaining adjustments.

Ft. Franklin maintains a rather high unemployment level with only a slight reduction in later years but this is possibly a function of high reading data. Still, the effect of outward movement of unemployed workers to areas of negative unemployment can be seen by the gradual reduction in the absolute number of unemployed persons. Acting here, as well, is the gradually increasing labour demand which is associated with basic growth, a factor which applies in all communities.

Under the NO HYDROCARBON scenario we find that unemployment is higher in almost every case than it was under the conditions of LOW IMPACT. However, the unemployment generally reaches lower levels during later years of the

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FIGURE 20B

UNEMPLOYED AND UNEMPLOYMENT RATE BY COMMUNITY AND YEAR

-NO HYDROCARBON-

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
	# %	# %	# %	# %	#%	# %	# %	# %	# %	# %	# %
Tuktoyaktuk	+16/11	+14/9	+16/10	+1 4/8	+18/10	+16/8	+16/8	+16/7	+14/6	+12/5	+1/4
Inuvik	+113/9	+107/8	+1 06/7	+101/7	+87/5	+63/3	+68/4	+52/2	+29/1	-7/0	-2/0
Ft. Good Hope	-6/17	-6/16	-6/14	-5/1 1	-7/15	-7/14	-8/16	-7/12	-6/10	-6/0	-4/5
Ft. Norman	+4/5	+5/6	+5/6	+4/5	+2/2	+4/4	+2/2	+3/3	+1/1	+2/1	+0/0
Colville Lake	-1/7	-1/7	+0/0	-1/6	-1/5	-1/5	-1/0	+0/0	+0/0	+0/0	+0/0
Paulatuk	+1/3	+1/3	+2/6	+2/6	+1/3	+2/6	+2/5	+2/5	+2/5	+2/5	+2/5
Arctic Red River	-1/3	-2/7	+0/0	-1/2	+0/0	+0/0	-1/2	-1/2	-1/2	+0/0	+0/0
Aklavik	-7/8	-7/7	-11/11	-8/7	-1 0/9	-9/7	-10/8	-11/8	-13/9	-12/8	-7/8
Norman Wells	-1/0	-2/1	-1/0	-2/1	-1/0	-1/0	-1/0	-1/0	-1/0	-1/0	-1/0
Ft. Franklin	+9/19	+10/20	+11/20	+1 3/22	+15/24	+14/21	+16/23	+16/22	+16/21	+16/21	+16/20
Sachs Harbour	+0/0	+0/0	-1/2	+0/0	+0/0	-1/2	-1/2	-1/2	+0/0	+0/0	+0/0
Ft. McPherson	-8/7	-6/5	-9/7	-10/8	-9/6	-8/5	-10/6	-9/5	-10/6	-8/4	-7/3

+Unemployed -Vacancies

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

forecast period and does move more consistently through the period. Inuvik especially, ends up with fewer unemployed at the end of the forecast period under the NO HYDROCARBON case than it does under LOW IMPACT conditions.

When dealing with unemployment as generated through our employment impact model, it is not reliable to separate the contributing effects of the GAS PLANT and OTHER HYDROCARBON activities. inter-occupation and inter-community movements induced by these components are not clearly separable so that only the base positions of the LOW IMPACT and NO HYDROCARBON scenarios are dealt with.

G. SECONDARY EFFECTS OF HYDROCARBON ACTIVITY

1. Employment by Industry

The multiplied effects of hydrocarbon activity in the Delta serves to increase employment in the communities of Inuvik, Ft. McPherson, Tuktoyaktuk, and Aklavik. In Inuvik the effect is felt most in the trade industry, followed with less effect in the finance, insurance, and real estate sectors, and still less but equivalent effect in the service and transportation industries. Minor effects are felt as well in the manufacturing, construction, and government sectors. Figure 21 illustrates the magnitude of the effects.

Ft. McPherson receives the next highest impact, the bulk of which is concentrated in the forestry industry with minor influence in the trade and manufacturing industries. In Tuktoyaktuk there is minimum effect in the trade, manufacturing, and construction sectors, while in Aklavik only a very small amount of impact is felt, all of it in the manufacturing industry.

The only difference between the GAS PLANTS and NO HYDROCARBON components are the amounts to be distributed. The distributions are the same in both cases so that the total secondary effects of the LOW IMPACT case are merely put into two packages; one being the GAS PLANTS induced secondary effects and the other being the OTHER HYDRO-CARBON secondary effects, both distributed among communities and years on the same basis.

H. OCCUPATIONAL SHORTAGES AND SURPLUSES

1. Surpluses of Delta Residents

Figure 22 shows the surpluses of Delta residents experienced under the development case of LOW IMPACT. Most occupations show few or no surplus with the only major over-supply indicated for surveyors, sport and recreation personnel, hunters and trappers, and low skilled workers in mining, quarrying, and oil field activities. These surpluses appear mainly in 1975 and 1976 and again in 1981, with no surpluses to speak of in the other years of the concern period.

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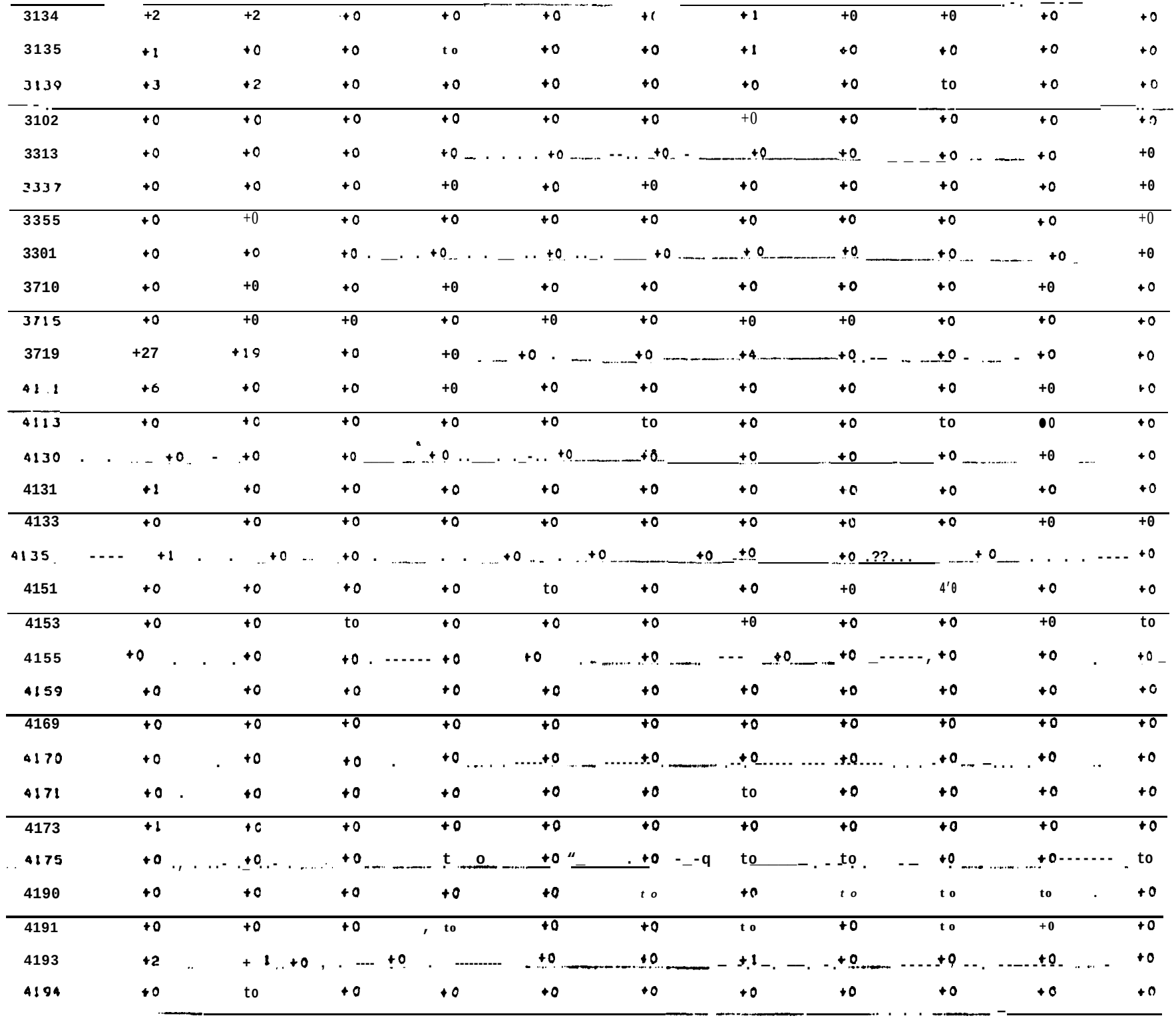
FIGURE 21

SECONDARY EFFECTS OF HYDROCARBON ACTIVITY
BY COMMUNITY AND YEAR

COMMUNITY	YEAR 1	2	3	4	5	6	7	8	9	10	11
-LOW IMPACT-											
Tuktoyaktuk	6	9	16	19		19	2)	22	21	21	24	25
Inuvik	370	508	802	960	987	1 0 3 5	1053	1037	1118	1185	1244	
Aklavik	1	2	3	3	3	4	4	4	4	4	5	
Ft. McPherson	49	68	107	127	131	138	142	139	150	159	164	
-NET EFFECT OF GAS PROCESSING PLANTS-											
Tuktoyaktuk	0	0	2	2	1	0	2	2	1	1	0	1
Inuvik	0	0	93	114	113	113	40	42	41	41	40	
Aklavik	-	0	0	1	0	0	1	0	0	0	0	1
Ft. McPherson	0	0	13	15	14	14	7	6	5	5	3	
-NET EFFECT OF OTHER HYDROCARBON-											
Tuktoyaktuk	6	9	14	17	9	19	20	20	22	24	24	
Inuvik	370	508	709	846	874	922	1013	995	1077	1144	1204	
Aklavik	1	2	2	3	3	3	4	4	4	4	4	
Ft. McPherson	49	68	94	112	117	124	135	133	145	154	161	

FIGURE 22
OCCUPATIONAL SHORTAGES AND SURPLUSES (+ OR -) BY YEAR OF DELTA RESIDENTS

YEAR 1											YEAR 11
1111	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1113	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
111s	+0	+0	+0	+0	+0	+0	+0	+0	+0	+ 0	+0
1131	+0	+0	+0	+0	+0	? 0	+0	+0	+0	+0	+0
1135	40	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1137	*0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1142	to	+0	+0	+0	t-o	+0	+0	+0	+0	+0	+0
1143	+0	+0	+0	+0	+0	+0	+0	+0	+0	to	+0
-1147	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1171	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1174	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
1179	+0	+0	+0	+0	40	+0	+0	+0	+0	40	+0
1102	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2135	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
'2154	+0	40	+0	+0	+0	+0	+0	to	+0	to	+0
2161	+70	+6C	+0	+0	+0	+ 0	+7	+0	+0	+0	+0
2165	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2311	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2319	+0	---	+0	to	+0	+0	+0	+0	+0	+0	+0
2331	+0	+0	+0	+0	+0	+0	+0	+0	to	+0	+0
2333	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2343	+0	+0	to	+ 0	+0	+0	+0	+0	+0	+0	+0
2349	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
2511	+0	+0	+0	to	+0	+0	+0	+0	+0	+0	+0
2731	+0	+0	+0	+0	+0	+0	+0	+0	+0	to	+0
2733	+0	0C	+0	+0	+0	+0	+0	+0	to	+0	+0
2797	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
02799	+0	+0	+0	+0	+0	+0	+0	+0	+0	t o	+0
3131	+0	+0	+0	+0	+0	+0	+0	+0	to	+0	+0



3134	+2	+2	+0	+0	+0	+(	+1	+0	+0	+0	+0
3135	+1	+0	+0	to	+0	+0	+1	+0	+0	+0	+0
3139	+3	+2	+0	+0	+0	+0	+0	+0	to	+0	+0
3102	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3313	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3337	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3355	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3301	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3710	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3715	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
3719	+27	+19	+0	+0	+0	+0	+4	+0	+0	+0	+0
41 1	+6	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4113	+0	+0	+0	+0	+0	to	+0	+0	to	00	+0
4130	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4131	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4133	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4135	+1	+0	+0	+0	+0	+0	+0	+0	??	+0	+0
4151	+0	+0	+0	+0	to	+0	+0	+0	4'0	+0	+0
4153	+0	+0	to	+0	+0	+0	+0	+0	+0	+0	to
4155	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4159	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4169	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4170	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4171	+0	+0	+0	+0	+0	+0	to	+0	+0	+0	+0
4173	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
4175	+0	+0	+0	t o	+0	+0	to	to	+0	+0	to
4190	+0	+0	+0	+0	+0	to	+0	to	to	to	+0
4191	+0	+0	+0	to	+0	+0	to	+0	to	+0	+0
4193	+2	+1	+0	+0	+0	+0	+1	+0	+0	+0	+0
4194	+0	to	+0	+0	+0	+0	+0	+0	+0	+0	+0

F GURE 22 CONT NUED

4197	+1	+0	+0	+0	+0		+0	+0	+0	+0	+0
4199	+3	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0
5130	+11	+8	+0	+0	+0	+0	+2	+0	+0	+0	+0
5135	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
5137	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
5177	+0	+0	+0	+0	40	00	+0	+0	+0	+0	+0
5101	+0	+0	+0	+0	+0	+0	+0	+0	to	+0	+0
5102	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6111	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6112	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6115	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6120	+0	+0	40	+0	+0	+0	+0	+0	to	+0	+0
6121	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6123	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6125	+0	+0	+0	+0	+0	40	+0	+0	+0	+0	+0
6129	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6130	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6133	to	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6139	+0	+0	+0	+0	+10	+0	+0	+0	+0	+0	+0
6144	*Q	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6147	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6149	+2	+1	+0	+0	+0	+0	+0	+0	+0	to	+0
6160	+0	*C	to	to	+0	to	+0	+0	+0	+0	+0
6161	+0	+0	+0	40	+0	+0	+0	to	+0	+0	+0
6165	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
6191	+0	+0	+0	+0	+3	+0	+0	+0	+0	+0	+0
6198	+0	+0	+0	to	+0	+0	+0	+0	+0	+0	+0
6101	+0	+0	+0	to	+0	+0	+0	+0	+0	+0	+0
6102	+1	+0	+0	+0	+0	to	+0	+0	+0	+0	+0
7102	+0	+0	+0	to	+0	+0	+0	+0	to	+0	+0

FIGURE 22 CONTINUED

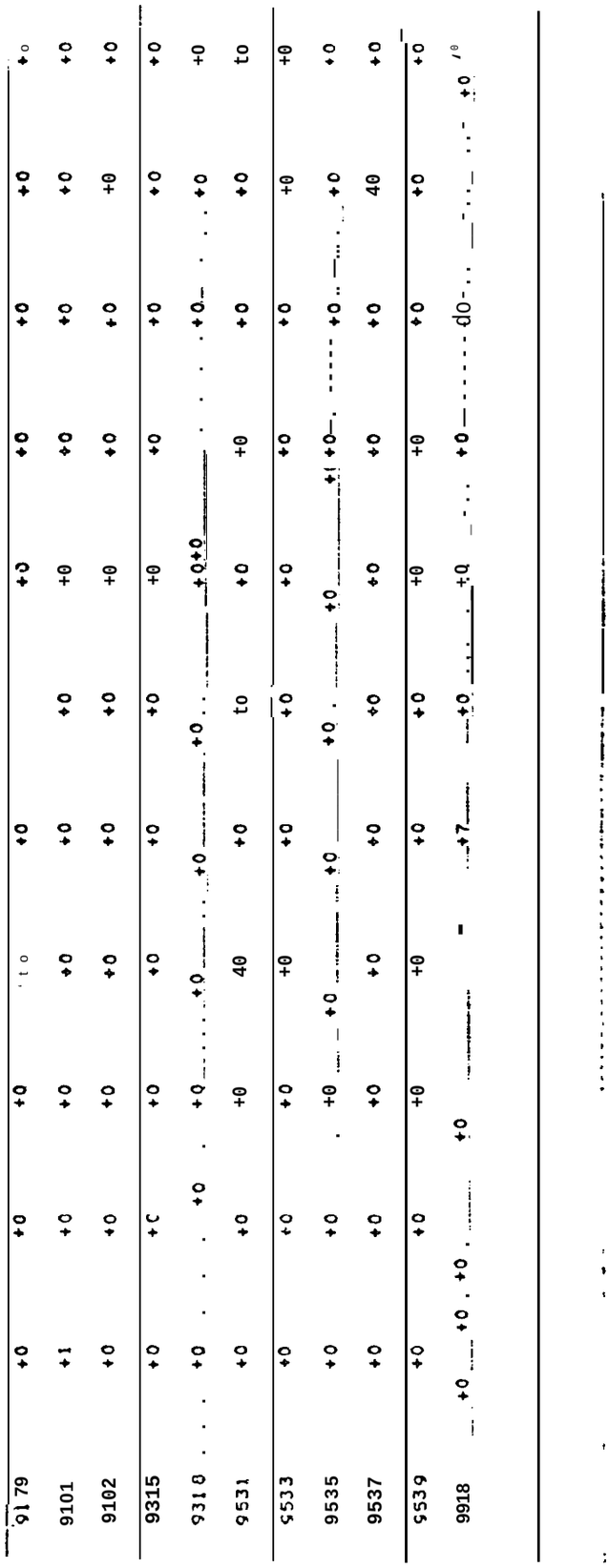
7313	+1	+0	+0	to	+0	+	+0	+0	"+0	+0	+0
7315	+47	+23	+0	+0	40	+0	+2	+0	+0	+0	+0
7511	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7513	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7710	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7711	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7713	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7715	+21	+8	+0	+0	+0	+0	+0	+0	+0	+0	+0
7718	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7719	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
7701	+42	+36	+0	+0	+0	+0	+5	+0	do	+0	'Q
7702	+236	+102	+0	+0	+0	+0	+5	+0	+0	+0	+0
8160	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8165	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
0176	+0	+0	+0	+0	+0	+0	+0	0	+0	+0	+0
8231	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
?3238	0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
829S	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8311	+0	+0	+0	to	+0	+0	+0	+0	+0	+0	+0
8313	+0	+0	+0	+0	+0	+0	+0	to	+0	+0	+0
8315	+0	+0	+0	40	+0	+0	+0	+0	+0	+0	+0
8319	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8333	+0	+0	+0	+0	+0	+0	+2	+0	+0	+0	+0
0335	+1	+0	+0	+0	to	+0	+3	+0	t o	+0	+0
8370	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8510	+2	+1	+0	+0	+0	+0	+0	+0	+0	to	+0
8533	+0	to	to	+0	+0	+0	+0	+0	+0	+0	+0
8535	+0	+0	+0	+0	+0	+0	+0	to	+0	+0	+0
8550	+0	+0	to,	+0	+0	+0	+0	+0	+0	+0	+0
8553	+1	+0	+0	+0	to	+0	to "	+0	+0	to	to

FIGURE 22 CONTINUED

FIGURE 22 CONTINUED

8555	+3	+0	+0	+0	+0		+0	+0	+0	to	+0
8557	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8563	+1	+C	40	+0	+0	+0	+0	+0	+0	+0	+0
8581	+4	+1	+0	+0	+0	+0	+0	+0	+0	+0	+0
8582	*0	+0	-.8	+0	+0	+0	?.Q	+0	+0	+0	+0
8584	+15	+12	+0	+0	+0	+0	+3	+0	+0	+0	+0
8588	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8599	+0	to	+0	+0	+0	--+0-	+ 0	+ 0	+0	+0	+0
8590	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8502	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
0710	-- ,	+0	+C	+0	+0	+0	+ 0	+0	+0	+0	+0
8711	+0	+0	+0	+0	+22	+0	●C	+0	+0	+0	+0
8718	+0	+0	+0	+0	+0	+0	+0	+0	+0	●0	+0
8731	+0	+0	+0	+0	+0	+0	+0	+0 + Q	-- +0	+0	+0
8733	+0	+0	+0	+0	+0	+0	+4	+0	+0	+0	+0
8735	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8780	+2	+0	+0	+0	+0	+0	+1	+0	+0	+0	+0
8781	+5	+3	40	+0	+0	+0	+4	+0	+0	+0	+0
8705	+4	+2	●Q	+0	+0	+0	+1	+0	+0	+0	+0
8791	+0	+0	+0	+0	+0	?-	+ 9	-+ o	-+0	+0	+0
0790	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
8799	+8	+4	+0	+0	+0	+0	+3	to	+0	+0	+0
u702	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
9111	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
9119	+0	+0	+0	+0	+0	+0	+0	to	+0	+0	+0
9151	+0	+0	+0	+0	+0	to	to	+0	+0	+0	to
9153	to	+0	to	+0	+0	+0	to	+0	+0	+0	+0
9155	+3	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
9173	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
9175	+0	+0	+0	+0	+23	+0	+0	+0	+0	+0	+0

FIGURE 22 CONTINUED



This would be due to the absorption of these workers into gas plant activities even though they may not be working in the same occupations.

2. Non-Delta Migration

Figure 23 outlines the amounts of migration into the Mackenzie Delta expected each year under the differing conditions specified. Under the LOW IMPACT case 3I10 migrants will enter the Delta with 322[10] coming as a result of GAS PLANT activity, 2709 as a result of OTHER HYDROCARBON activity, and 79 due to normal growth.

The GAS PLANTS component experiences outward movement (minus figures), during the years of operations only activity, as a result of decreased demand following the construction phase. For the OTHER HYDROCARBON case the situation is one of general growth with minor fluctuations.

1. UNDERUTILIZATION

The "Underutilization Index," values of which are provided in Figure 24, is used to indicate the number of workers who are expected to be employed in positions requiring a level of skill which is below the level of skill that they possess. This index deals only with employed persons so that it does not include either unemployed persons or persons who are not in the employed labour force.

[10] Net figures.

DRAFT ONLY

FIGURE 23

MIGRATION INTO THE MACKENZIE DELTA BY YEAR

YEAR	LOW IMPACT	NET EFFECT OF GAS PLANTS	NET EFFECT OF OTHER HYDROCARBON	NO HYDROCARBON
1	37	0	37	0
2	79	0	79	0
3	511	446	40	25
4	432	226	178	28
5	290	98	192	0
6	230	-36	266	0
7	111	-368	479	0
8	162	-20	182	0
9	406	-14	420	0
10	397	-19	416	0
11	455	9	420	26
TOTAL	3110	322	2709	79

DRAFT ONLY

FIGURE 24

UNDERUTILIZATION INDEX BY YEAR

YEAR	LOW IMPACT	NET EFFECT OF GAS PLANTS	NET EFFECT OF OTHER HYDROCARBON	NO HYDROCARBON
1	22	0	22	0
2	259	0	259	0
3	481	13	468	0
4	544	-75	619	0
5	544	-195	739	0
6	664	-194	856	2
7	982	77	812	93
8	1236	127	908	201
9	1336	129	921	286
10	1463	137	937	389
11	1566	135	924	507

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

The greatest amount of underutilization is found under the conditions of LOW INPACT with considerably lower levels found under the NO HYDROCARBON scenario, The net effect of the OTHER HYDROCARBON on underutilization increases consistently over the forecast period while the GAS PLANTS reduce the index during the years of gas plant construction and then continue to increase the index during the operational phase.

As the underutilization index is in effect a measure of the relationship between skills demanded and skill possessed, in the Delta, the reduction of the index during the period of gas plant construction indicates that the type of activity is more suited to the skills of the Delta labour force than are the other concerned activities.

J. INTER-COMMUNITY MIGRATION

Figure 25 below shows the levels of inter-community migration expected under the LOW IMPACT and NO HYDROCARBON development scenarios. In both cases the redistribution of persons is greatest during periods of largest labour demand, indicating the tendency to relocate in response to employment opportunities.

DRAFT ONLY

FIGURE 25

INTER-COMMUNITY MIGRATION BY YEAR

YEAR	LOW IMPACT	NO HYDROCARBON
1	13	2
2	51	3
3	40	3
4	41	5
5	24	1
6	19	2
7	26	4
8	26	2
9	27	2
10	23	2
11	18	15

Source: Government of the Northwest Territories (TERIS) and Manforce Research Associates.

SECTION III

TRAINING

III. TRAINING

A portion of the terms of reference for this study include identification of what the Proponents of the Mackenzie Delta Gas Processing Plants intend to provide in the areas of:

a) On-The-Job-Training;

b) Pre-Employment Training;

c) Recruiting And Promotion From Within;

d) Instructional Facilities; and

e) Training In Study Region Communities.

The following is an identification of the Proponent's intentions, as stated, in provided information from the noted areas.

A. ON-THE-JOB-TRAINING

The Proponents indicate that they plan to provide training for both the operations and maintenance sectors within a typical gas plant. These programs are planned for both on-the-job and off-hours instruction. For specification of the type of in-house programs, which the Proponents plan to offer, you are referred to Appendices "A" and "B" of "Responses to Information Request for Socio-Economic Supplementary Concerns." This is consistent with their statement on page three of that document which indicates that "The Proponents will work closely with al I levels of government to ensure. ..that on-the-job training wi 11 be provided to develop persons for higher levels of responsibility."

B. PRE-EMPLOYMENT TRAINING

The Proponent has indicated participation in the "program of job training for northern residents for pre-construction, construction, and operational phases."[12] The participation of the Proponent in these programs is essential but the largest task in pre-employment training is to provide basic education to a level which is conducive to employment entry.

C. RECRUITING AND PROMOTION FROM WITHIN

This area is dealt with in Section IV under "Provision of Counseling to Allow Smooth Transition to the Wage Economy and Informed Choices Regarding Career Development," page 77.

D. INSTRUCTIONAL FACILITIES

The Proponent has indicated participation in training courses which, we assume, means participation as well in the provision of instructional facilities required to allow the training to be carried out. As the majority of training with respect to gas processing plants is carried out in operational plants it would be in order to request that the proposed plants for the Delta, when completed, be used as instruction locations whenever possible.

E. TRAINING IN STUDY REGION COMMUNITIES

The Proponent has indicated that due to the nature of the training and the facilities involved, training for gas processing plant positions cannot practically be done in study region communities.

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[11] Responses to Information Request for Socio-Economic Supplementary Concerns, p. 2.

F. CONCLUSION

In general, the Proponent has indicated that plans are made or are under development in order to allow realization of all the training activities outlined above. However, it is our feeling that the Proponent is unnecessarily vague and non-committal in most of the statements made in these areas; enough so to cause concern as to whether or not adequate preparation is being done or even contemplated. It would be our recommendation that the Proponent be asked to specify its exact intentions in the following areas, prior to granting of an approval to proceed with developments.

1. What is the exact minimum number of persons, by course or occupation, who would be offered employment in the gas processing plants? This number is to include operations and maintenance positions and to be given for each year, as additional staff is required. Replacement due to attrition is not to be included in these figures. Based on this information, specific decisions regarding the number of persons to be trained, by area, can be made.

2. In what areas will formal educational requirements for employment be reduced? Mention has been made that requirements may be reduced in areas where safety will not be sacrificed as a result of the lowering of requirements but the areas in which this will appear must be specified. Until this is done the client group for entry into gas plant occupations cannot be specified.

SECTION IV

COUNSELING
AND
CAREER DEVELOPMENT

Iv. COUNSELING AND CAREER DEVELOPMENT

A. PROVISION OF COUNSELING TO ALLOW SMOOTH TRANSITION TO THE WAGE ECONOMY AND INFORMED CHOICES REGARDING CAREER DEVELOPMENT

There have been many references to the problems encountered by persons during the transition from a subsistence-based to a wage-based economy. Concern over the effects of drastic changes in the life styles, which may be required, have received significant attention; so much in fact that there seems to be some doubt that this transition can ever be made with complete success for some groups. It is our contention however, that, although in general the basic transition has been made there still remains to be solved a number of transition associated problems. In the area of employment, the problems of major note are to be found within the realms of counseling for transition and career development.

1. Transition

We have already indicated that we feel the basic transition from a traditional-based to a wage-based economy has been made in many areas. In fact, this is evidenced somewhat by the number of native northerners who have worked for wages at one time or another. The concern then is not with the primary transition but rather relates to the difficultities which arise in the post transition phase; particularly in the area of assimilation into the wage-based economy.

With regards to the assimilation into the new conditions which coincide with the transition, there is a definite need for a more detailed and comprehensive understanding of the social mores, economic realities, and physical parameters which *come* to play in each area.

This means that both northern and southern workers are in need of instruction in these important areas. Canadian Arctic Gas Pipeline Limited (CAGPL) seems to have taken special note of the outlined problem areas, as evidenced by their response to Question 5, "Orientation and Consultation Program", in *Responses To Pipeline Application Group Requests For Supplementary Information.* Also, the need for orientation and counselling on the part of wives and families who experience the transition along with the husband, has been identified and outlined. As well, Part II, pages 24 - 25 of that same appendix clearly identifies the need for orientation programs to include the owner, manager, and worker groups of southerners.

Thus, it would be our recommendation that the Proponents of the Mackenzie Delta Gas Processing Plants be required to provide counseling and orientation programs to both northern and southern workers and their families to at least the extent outlined in the above referenced activity plans. Of course, changes in content and emphasis will be required to accommodate the differing situations of gas plants versus pipeline activity but the core study areas are quite comprehensive and should be maintained. Expansion and refinement will be required as the work proceeds but this should wait until some evaluation of success or lack of success is available, rather than trying to develop the ultimate plan at this time.

Also, it should be indicated that these programs are to be initiated at the start of construction and continued into the operations phase, with some modification, rather than having two somewhat separate programs of differing coverage as suggested by the Proponent.

Consistent with this we would suggest that the Northwest Territories Government establishment in Inuvik be increased in order that one position be available to organize and effect that government's participation in the ongoing orientation, development, and counseling programs. This would be required as an addition, rather than a change in terms of reference for present staff, as a result of the generally increased level of total activity in the areas of employment and training which would arise with gas plant development. Necessary coordination between the Department of Economic Development and the Department of Education may allow the use of one person, half-time, from each department to meet the indicated need for personnel but this is viewed as an inferior alternative to having one person responsible for the input of both departments.

2. Career Development

The first area that should be considered with respect to the career development of the individual northern resident is that of promotion within the company for which he is working. As the Proponent has indicated that this practice of promotion-from-within will exist in the Mackenzie Delta Gas Processing Plants to the extent that it does elsewhere in the industry, we assume that coincident career development will proceed at a rate determined by qualifications and ability.

This poses a problem in that many native northerners do not possess the formal qualifications necessary to gain entry to a large number of gas plant positions. The Proponent has stated that they will encourage interested persons to achieve a minimum of a Grade 12 education in order that they may assume advanced positions in the industry but indicate that they do not expect to relax these requirements in the case of native northerners. In that the Applicants for the Mackenzie Valley Pipeline have indicated that they would be prepared to relax formal job entry requirements in order to allow further participation of northern natives)provided safe work practices are not compromised, we feel that the Proponents of the gas processing plants should be prepared to do the same. It appears that a Grade 12 level of education in mathematics and science is almost always required to allow the worker to properly perform his designated task, so reduction of requirements may not be practical in those areas, but formal qualification in other course areas at the Grade 12 level should not be mandatory requirements for employment.

Given the above conditions we have moved towards enabling a greater degree of entry to skilled positions on the part of native northerners but the problem of career development has not been remedied. Even with promotion-from-within it must be expected that the most qualified will achieve the greatest degree of promotion or career development. Thus it becomes of paramount importance that mechanisms be available to native northerners for the upgrading of their education to levels equivalent to that of other workers in similar entry positions. The relaxation of basic entry requirements

allows the native northerners to obtain employment in skilled areas and to work towards a successful transition from a subsistence-based to a wage-based economy. The next step is for advancement from the basic entry position.

To do this the worker must first obtain all of the basic formal education requirements previously unrequited so that he is on an equal footing with those workers who entered the job having those qualifications. Subsequent steps are then to gain training and experience which will enable development of qualifications allowing:

a) advancement within company of present hire;

b) intra-industry mobility; and

c) inter-industry mobility.

In order to achieve this development of careers the native northern worker must be provided with the necessary training and counseling opportunities so that informed career development choices may be made. As a result we would recommend that the above detailed services be made available. The responsibility for the training and counseling required to allow advancement within the gas plant company should be placed upon that company while for intra-industry and inter-industry mobility should be the joint responsibility of the industry and government and the government with assistance by the industry, respectively.

Again we see that CAGPL has indicated a willingness to provide its portion of the above outlined progression, as is evidenced by its participation in the Northern Training Program.

The Proponent has indicated that it has and will participate in that program but we feel that this participation should be expanded further until the full intent of the noted career development progression is realized. Only then will the people of the north derive some real benefit from this development of the north.

Finally, indications are that there has been much duplication of effort with respect to the counseling, location, and selection of workers. This lack of coordination has led to situations where the same person is being chased for many jobs. Although choice of directions is desirous, too much choice may be damaging. All of this further illustrates the need for coordinated effort, regardless of what each agency is required to do.

SECTION V

UNION INVOLVEMENT

V. UNION INVOLVEMENT

A. GENERAL

The concern that has been expressed in the past with regard to the potential success of training and employment programs has always considered the importance of the unions in these areas. Agreements with owners and contractors are necessary if planned programs are to succeed but all this can lead to a dead end if the positions of the labour unions in these areas are not clearly identified. The Alaskan experience has illustrated the power of the labour unions and has shown how understanding of positions in the beginning can make all the difference to the successful functioning of employment and training programs. The Proponent of the gas plants was requested to indicate what was planned with respect to union involvement, but in the absence of any response to the request we have looked at some of the major concern areas.

For these reasons we have noted a number of conditions which should either be specified or negotiated prior to approval of any permits to proceed with construction of the gas processing plants. Their inclusion in any contractual agreement may not ensure success but their absence will surely give rise to many destructive situations.

B. RECOMMENDATIONS

The following is a listing of conditions which should be agreed to by the owners, contractors, and labour unions to be involved with gas plant activity.

1. Native northerners should be included in the union hiring priority "A" list.

2. There must be only ONE recruitment centre for Delta residents but major recruitment effort should be made at the community level .

3. Salary scales should reflect the relevant training undergone; in accordance with components of training rather than on the broad basis currently used.

4. A specific number of native northerners coming out of training courses should be offered appropriate employment.

5. Hiring of non-Delta residents should only be allowed in centres outside of the Northwest Territories.

APPENDIX A

DELTA OCCUPATIONAL CLASSIFICATION

FIGURE A1

FREQUENCY DISTRIBUTIONS
MACKENZIE DELTA REGION*

BY OCCUPATION

CCDO	NO	CCDO	NO	CCDO	NO	CCDO	NO	CCDO	NO
1111	3	3337	13	6111	5	7718	25	9111	25
1113	15	3355	3	6115	8	7719	3	9119	5
1115	5	3719	5	6119	3	8215	5	9151	5
1119	10	4111	40	6120	5	8295	20	9155	10
1132	3	4113	10	6121	40	8335	5	9173	33
1143	5	4130	10	6125	60	8510	3	9175	73
1145	8	4131	5	6130	10	8533	3	9179	13
1147	15	4133	28	6133	10	8553	23	9318	8
1171	13	4151	3	6139	55	8555	20	9531	3
1174	10	4153	3	6144	3	8563	28	9533	10
1179	20	4155	40	6149	25	8s81	15	9535	3
2161	10	4159	3	6160	5	8582	3	9537	3
2331	10	4169	15	6161	3	8s84	18	9918	198
2333	8	4171	3	6191	60	8710	3	0000	1913
2343	3	4173	10	6198	68	8711	93		
2349	3	4175	3	7313	3	8733	8	TOTAL	3866
2511	3	4193	28	7315	118	878o	25		
2731	5	4194	5	7511	15	8781	35		
2799	13	4197	48	7513	8	8785	10		
3131	5	4199	15	7710	3	8791	23		
3135	8	5130	38	7711	15	8798	40		
3139	8	5137	55	7715	13	8799	55		

*Includes the communities of Aklavik, Arctic Red River, Ft. Franklin, Ct. Good Hope, Ft. McPherson, Ft. Norman, Inuvik, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Colville Lake.

Note: The total number of events in any table (except as noted) should approximate 3840. Variations from this amount are the result of rounding when applying the adjustment co-efficient of 2.5.

Source: Territorial Employment Record and Information System (TERIS)

Prepared by MANFORCE RESEARCH ASSOCIATES February, '97....

FIGURE A2

OCCUPATIONAL DESCRIPTIONS

CCDO	DESCRIPTION
1111	Members of Legislative Bodies
1113	Government Administrators
1115	Postmasters
1131	Management Occupations: Natural Sciences, Engineering and Mathematics
1135	Financial Management Occupations
1137	Sales and Advertising Management Occupations
1142	Services Management Occupations
1143	Production Management Occupations
1147	Management Occupations, Transport and Communications Operations
1171	Accountants, Auditors and Other Financial Officers
1174	Personnel and Related Officers
1179	Occupations Related to Management and Administration, n.e.c.
1102	Trainees and Other Occupations Related to Management and Administration, n.e.c.
2135	Life Sciences Technologists and Technicians
2154	Petroleum Engineers
2161	Surveyors
2165	Architectural and Engineering Technologists and Technicians
2311	Economists
2319	Occupations in Social Sciences, n.e.c.
2331	Social Workers
2333	Occupations in Welfare and Community Services
2343	Lawyers and Notaries
2349	Occupations in Law and Jurisprudence, n.e.c.
2511	Ministers of Religion
2731	Elementary and Kindergarten Teachers
2733	Secondary School Teachers

FIGURE A2 CONTINUED

2797	Instructors and Training Officers, n.e.c.
2799	Other Teaching and Related Occupations, n.e.c.
3131	Nurses, Graduate, Except Supervisors
3134	Nursing Assistants
3135	Nursing Aides and Orderlies
3139	Nursing, Therapy and Related Assisting Occupations, n.e.c.
3102	Trainees and Other Occupations in Medicine and Health
3313	Product and Interior Designers
3337	Radio and Television Announcers
3355	Translators and Interpreters
3301	Other Occupations in Writing, n.e.c.
3710	Coaches, Trainers, Instructors and Managers, Sport and Recreation
3715	Attendants, Sport and Recreation
3719	Occupations in Sport and Recreation, n.e.c.
4111	Secretaries and Stenographers
4113	Typists and Clerk-Typists
4130	Supervisors, Bookkeeping, Account-Recording and Related Occupations
4131	Bookkeepers and Accounting Clerks
4133	Tellers and Cashiers
4135	Insurance, Bank and Other Finance Clerks
4151	Production Clerks
4153	Shipping and Receiving Clerks
4155	Stock Clerks and Related Occupations
4159	Material Recording, Scheduling and Distributing Occupations, n.e.c.
4169	Library, File and Correspondence Clerks and Related Occupations, n.e.c.
4170	Supervisors: Reception, Information, Mail and Message Distribution Occupations
4171	Receptionists and Information Clerks
4173	Mail and Postal Clerks
4175	Telephone Operators
4190	Supervisors, Other Clerical and Related Occupations, n.e.c.
4191	Collectors
4193	Travel Clerks, Ticket, Station and Freight Agents

FIGURE A2 CONTINUED

4194	Hotel Clerks
4197	General Office Clerks
4199	Other Clerical and Related Occupations, n.e.c.
5130	Supervisors: Sales Occupations, Commodities
5135	Salesmen and Salespersons, Commodities, n.e.c.
5137	Sales Clerks, Commodities
5177	Business Services Salesmen
5101	Trainees and Other Sales Occupations
5102	Trainees and Other Sales Occupations
6111	Fire-Fighting Occupations
6112	Policemen and Detectives, Government
6115	Guards and Watchmen
6120	Supervisors, Food and Beverage Preparation and Related Service Occupations
6121	Chefs and Cooks
6123	Bartenders
6125	Waiters, Hostesses and Stewards, Food and Beverage
6129	Food and Beverage Preparation and Related Service Occupations, n.e.c.
6130	Supervisors, Occupations in Lodging and Other Accommodation
6133	Chambermaids and Housemen
6139	Occupations in Lodging and Other Accommodation, n.e.c.
6144	Guides
6147	Babysitters
6149	Personal Service Occupations, n.e.c.
6160	Supervisors, Apparel and Furnishings Service Occupations
6161	Laundering Occupations
6165	Pressing Occupations
6191	Janitors, Charworkers and Cleaners
6198	Occupations in Labouring and Other Elemental Work, Services
6101	Trainees and Other Service Occupations
6102	Trainees and Other Service Occupations
7102	Trainees and Other Animal Husbandry Occupations
7313	Fishermen: Net, Trap and Line

FIGURE A2 CONTINUED

7315	Hunting, Trapping and Related Occupations
7511	Forestry Conservation Occupations
7513	Timber Cutting and Related Occupations
7710	Foremen, Mining and Quarrying Including Oil and Gas Field Occupations
7711	Rotary Well-Drilling and Related Occupations
7713	Other Rock and Soil Drilling Occupations
7715	Blasting Occupations
7718	Occupations in Labouring and Other Elemental Work, Mining and Quarrying Including Oil and Gas Fields
7719	Mining and Quarrying Including Oil and Gas Field Occupations, n.e.c.
7701	Other Oil and Gas Field Occupations
7702	Other Oil and Gas Field Occupations
8160	Foremen: Chemicals, Petroleum, Rubber, Plastic and Related Materials Processing Occupations
8165	Distilling, Subliming and Carbonizing Occupations, Chemicals and Related Materials
8176	Inspecting, Testing and Sampling Occupations: Chemicals, Petroleum, Rubber, Plastic and Related Materials Processing
8231	Sawmill Sawyers and Related Occupations
8238	Occupations in Labouring and Other Elemental Work: Wood Processing, Except Paper Pulp
8295	Hide and Pelt Processing Occupations
8311	Tool-and Die-Making Occupations
8313	Machinist and Machine-Tool Setting-Up Occupations
8315	Machine-Tool Operating Occupations
8319	Metal Machining Occupations, n.e.c.
8333	Sheet-Metal Workers
8335	Welding and Flame Cutting Occupations
8370	Foremen: Clay, Glass, Stone and Related Materials Machining Occupations
8510	Foremen, Fabricating and Assembling Occupations, Metal Products, n.e.c.
8533	Electrical and Related Equipment Installing and Repairing Occupations, n.e.c.
8535	Electronic and Related Equipment Installing and Repairing Occupations, n.e.c.

FIGURE A2 CONTINUED

8550	Foremen: Fabricating, Assembling and Repairing Occupations: Textile, Fur and Leather Products
8553	Tailors and Dressmakers
8555	Furriers
8557	Milliners, Hat and Cap Makers
8563	Sewing Machine Operators, Textile and Similar Materials
8581	Motor-Vehicle Mechanics and Repairmen
8582	Aircraft Mechanics and Repairmen
8584	Industrial, Farm and Construction Machinery Mechanics and Repairmen
8588	Precision-Instrument Mechanics and Repairmen
8589	Other Mechanics and Repairmen, n.e.c.
8590	Foremen: Product Fabricating, Assembling and Repairing Occupations, n.e.c.
8502	Other Repairing Occupations
8710	Foremen: Excavating, Grading, Paving and Related Occupations
8711	Excavating, Grading and Related Occupations
8718	Occupations in Labouring and Other Elemental Work: Excavating, Grading, and Paving
8731	Electrical Power Linemen and Related Occupations
8733	Construction Electricians and Repairmen
8735	Wire Communications and Related Equipment Installing and Repairing Occupations
8785	Painters, Paperhangers and Related Occupations
8791	Pipefitting, Plumbing and Related Occupations, n.e.c.
8798	Occupations in Labouring and Other Elemental Work, Other Construction Trades
8799	Other Construction Trades Occupations, n.e.c.
8702	Trainees and Other Construction Trades Occupations
9111	Air Pilots, Navigators and Flight Engineers
9119	Air Transport Operating Occupations, n.e.c.
9151	Deck Officers
9153	Engineer Officers, Ship
9155	Deck Crew, Ship
9173	Taxi Drivers and Chauffeurs

FIGURE A2 CONTINUED

9175	Truck Drivers
9179	Motor Transport Operating Occupations, n.e.c.
9101	Trainees and Other Motor Transport Occupations
9102	Trainees and Other Motor Transport Occupations
9315	Material-Handling Equipment Operators, n.e.c.
9318	Occupations in Labouring and Other Elemental Work, Material-Handling, n.e.c.
9531	Power Station Operators
9533	Stationary Engine and Auxiliary Equipment Operating and Maintaining Occupations
9535	Water and Sanitation Utilities Equipment Operating Occupations
9537	Pumping and Pipeline Equipment Operating Occupations
9539	Stationary Engine and Utilities Equipment Operating and Related Occupations, n.e.c.
9918	Occupations in Labouring and Other Elemental Work, n.e.c.