DEPARTMENT OF INDIAN AND NORTHERN AFFAIRS

Project Co-ordination Handbook

September 1975

Revision

Indian and Northern Affairs | Affaires indiennes et du Nord

OTTAWA, Ontario K1A 0H4

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Our file *Notre référence*

Mackenzie Delta Gas Gathering System Project

-- As mentioned in my memorandum dated July 15, 1975, enclosed please find a revised and expanded information package, which has been prepared by the Project Co-ordination Team.

Frederick J. Joyce,
Director,
Northern Natural Resources
and Environment Branch.

Encl.

CONTENTS

PREFACE

This document sets out activity plans for the Mackenzie Delta Gas Gathering System Project. This Project involves planning and implementation of the Mackenzie Delta Gas Gathering System, as well as the assessment activities which are a necessary prelude to government approval of the gas gathering system.

The object of the work on this document is to ensure that planning and assessment activities in the private and public sectors are suitably co-ordinated. It also provides a basis for measuring progress as the planning and assessment proceed.

In addition, this handbook outlines other major resource development activities in the Delta, and describes the context within which the Gas Gathering System Project will operate.

As events necessitate changes to the project plan this document will be updated.

I. INTRODUCTION

An overview of the Mackenzie Delta Gas Gathering System Project is shown in Figure 1. Here blocks correspond to major activity areas and arrows denote interrelationships between them. In what follows, the content of each major activity area and their major interrelationships will be described.

At the core of the overall development process is the Technical Plan submitted by Gulf, Shell & Imperial Oil. This includes development well drilling, processing plants, gathering systems and support facilities. Both Federal and Territorial Governments are responsible for the assessment of these plans from technical, land tenure, environmental, social, cultural and economic standpoints. The results of this assessment will serve to trigger changes in the Technical Plan, and several iterations of this process may be required. When the assessment activity is complete, it will feed into the social, cultural and economic planning activity that must take place in the Mackenzie Delta Region. This will involve the planning necessary to accommodate the influx of population and economic activity that will accompany development of the Gas Gathering System. This planning activity will, however, comprise only part of the overall Regional Plan which must accommodate other major developments such as the pipeline and offshore drilling. Some aspects of the Regional Plan will in turn have impact upon details of the Technical Plan. This relationship is noted in Figure 1.

Following completion of the Technical Plan and once the requisite approvals have been given, the technical implementation will begin. This will involve actual construction of the early stages of the operation of the Gas Gathering System. In conjunction with the technical implementation, the social, cultural and economic plan will be implemented to provide infrastructure, social services and an economic base in support of the Gas Gathering System. At the same time, to ensure that planning guidelines are adhered to in the implementation phase, monitoring and surveillance activity will be undertaken to cover all aspects of the development.

In what follows, details of the activities, their durations, timing and interrelationships have been assembled for each of the following areas:

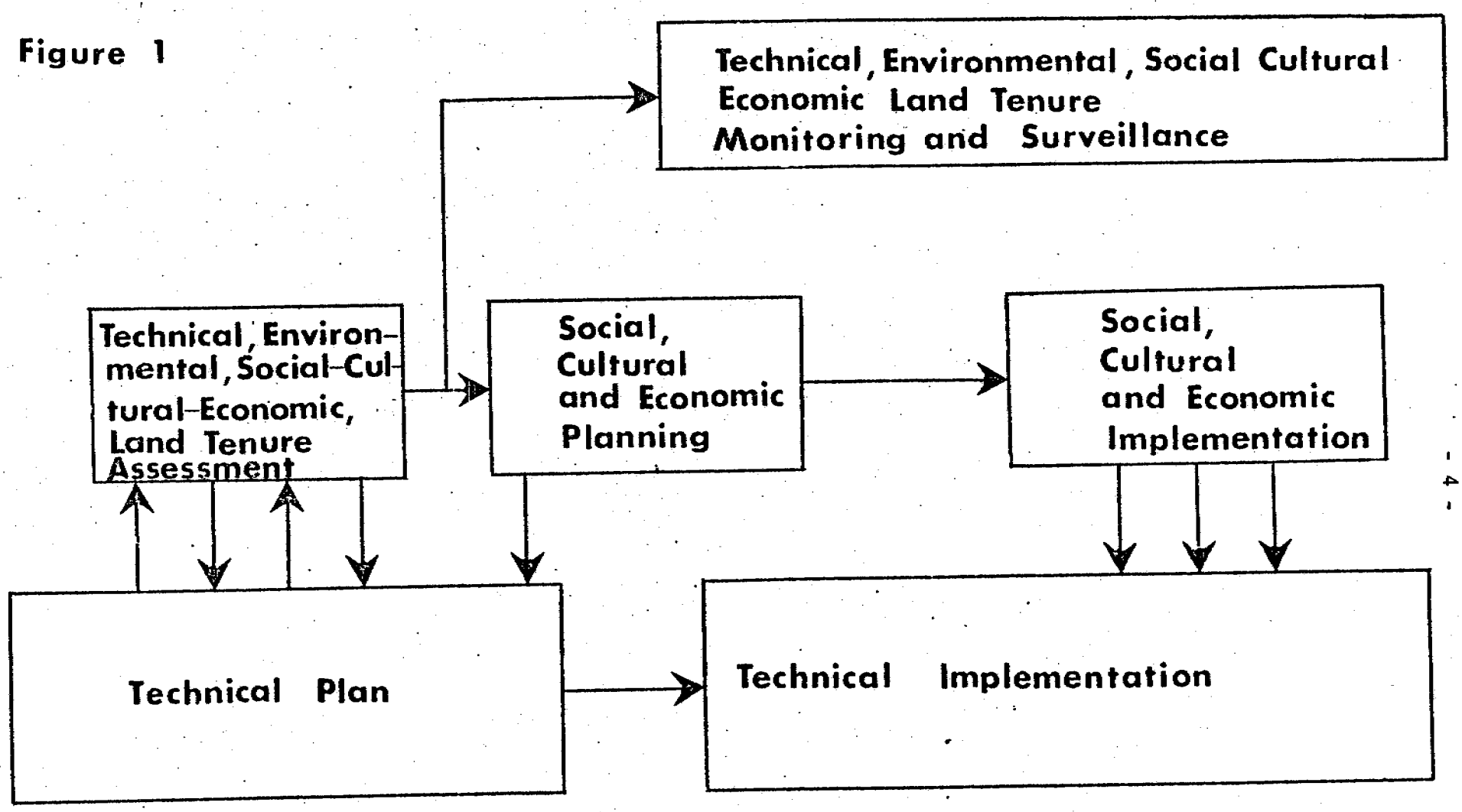
Planning:

- Technical (Imperial Oil)

Assessment:

- Technical
- Social-Cultural-Economic
- Environmental
- Land Tenure Agreement
- Industry Activity

Figure 1



Mackenzie Delta
Gas Gathering System
Project Overview

JULY

Four major networks are presented here, one for the Technical Plan (Diagram A), one for the overall Project Plan which includes the Industry Activity Schedule, Land Tenure Approval, Environmental, Social-Economic-Cultural and Technical Assessment processes (Diagram B), one for the Technical Assessment Schedule drawn on a different time scale (Diagram C), and the fourth for exogenous activities that may affect the Project (Diagram E). Critical paths, major decision points and communication links between the Technical, Environmental and Social-Economic-Cultural Assessment Schedules have been drafted on Diagrams B and C. A summary diagram containing major linkages, decision points, and exogenous activites (Diagram D) has been drawn for the purpose of monitoring and surveillance.

For each area, activity narratives have been compiled along with summary schedules and a detailed network showing the relationships between activities. An exception occurs for the Technical Plan where only the plan has been shown. The Technical Plan and Technical Assessment Schedule are being revised for the October edition of this booklet. Once the revision is completed, narratives of the Technical Plan will be provided. In each network chart, nodes correspond to events marking the completion of an activity while branches (in solid lines) denote the duration and timing of each activity, and dotted lines indicate slack periods. Heavy black arrows running vertically on the chart denote major linkages between project areas.

II. TECHNICAL PLAN

(See Diagram A)

Gas production in the Mackenzie Delta area of Northern Canada is expected to start in 1980. In each gas field, producing gas wells will be directionally drilled from a gravel covered pad or cluster; the gas produced from each well will be gathered by individual lines to a central point at or near the cluster for initial conditioning. The gas will then move through the pipelines to the processing plants, where it will be treated to transmission line specifications. Treatment will include separation, dehydration and hydrocarbon dew-point control by refrigeration.

The Technical Plan network in Diagram A shows the activity schedule for the planning and construction of the Taglu gas plant by Imperial Oil Limited. Similar activity schedules will be prepared for Gulf and Shell Oil Canada Ltd. and these will be included along with the Imperial Plan in revised format in the next revision of these plans.

III. ASSESSMENT ACTIVITIES

(See Diagram, B & C)

TECHNCIAL ASSESSMENT (See Diagram C)

A. Activity Narratives

1. Documentation and Interpretation of Geological and Reservoir Data (Oil and Minerals Division)

This data is necessary background material for production engineering and reservoir engineering studies. These production and reservoir engineering studies involve the review of alternate development techniques in order to maximize hydrocarbon recovery.

2. Compilation of Reservoir and Geological Data (Industry)

Geological investigations and compilation of data necessary for production and reservoir engineering will occur. Existing data will be used to derive procedures and techniques for maximizing hydrocarbon recovery.

3. Preparation of Guidelines for Industry by the Advisory Committee on Canadian Contents in Oil and Gas Operation on Canadian Lands

The Committee on Industrial Benefits from National Resource Developments meets with the proponents and engineering contractors to discuss Canadian sourcing in respect to all matters relating to the design and construction of the gas processing plants. Guidelines expressing the Governments' expectations in this regard are being prepared.

4. Assessment of Industry's Geological and Reservoir Data

Geological and Reservoir Data submitted by industry will be assessed using D.I.N.A.'s study results. A request for additional data and/or field tests and requests for drilling of additional delineation wells may result.

5. Review of Preliminary Layout of Land Tenure

Review of draft Land Tenure documents so as to ensure the inclusion of all pertinent technical changes and regulations.

6. Production Engineering and Updated Reservoir Studies

Methods and techniques of field development will be reviewed to ensure that field exploitation will be done in the safest, most economical and efficient manner. The production engineering and updated reservoir studies will be conducted in preparation for the assessment of industry's Development Plan.

7. Production Engineering, Updated Reservoir Studies and Development Planning (Industry)

Industry will develop techniques and methods for resource exploitation. Studies to achieve maximum hydrocarbon recovery by using the most economical, efficient and safest equipment, facilities and sound engineering practices will be undertaken.

8. Review of First Draft Land Tenure Agreement

This is to ensure that concerns which have been identified since the original inputs to the preliminary layout of Land Tenure documents are adequately covered.

9. Design Engineering (Industry)

Design engineering includes the design of components in detail with final engineeering drawings. The design of the pipeline, gas processing plants and associated support facilities will be involved.

10. Review of Final Draft Land Tenure Agreement

Final checking of the Land Tenure documents to ensure that all technical requirements are adequately dealt with and gaps filled.

11. Review Process of Design Engineering

A detail description with engineering drawings of the pipeline, gas processing plants and associated facilities will be examined to ensure that they comply with various codes and regulations. Special consideration to certain design criteria will be given in light of the Mackenzie Delta environment. An Approval to Construct will be issued upon completion of the review.

12. Assessment of Industry's Plan for Field Development

Industry's Development Plan will be assessed to ensure that the fields are exploited so as to obtain maximum ultimate recovery in a safe, economical and efficient manner using properly designed facilities and equipment and advanced recovery methods based on sound engineering practices.

13. Drill and Suspend Well Clusters (Industry)

Gas wells, arranged in clusters will be drilled and suspended in preparation for operation and production.

14. On-Site Construction (Industry)

Prefabricated modules will be installed. Pipework, instrumentation systems and well cluster facilities will be constructed.

15. Field Inspection of Construction

On-site inspection during the construction phase will occur to ensure that latest standards and safety regulations are properly adhered to.

16. Assessment, Inspection and On-Site Testing

Testing and Inspection of pipelines, pressure vessels, safety valves and support facilities equipment will take place to probe for any operational faults. Upon completion of testing and inspection, a Provisional Approval to operate will be given.

17. Submission of As-Built Drawings (Industry)

Industry will prepare As-Built Drawings of the pipeline, gas processing plant and support facilities. Any changes from their original design will be clearly indicated.

18. Review of As-Built Drawings

Drawings of existing structures and facilities will be assessed to ensure that changes are properly indicated and verified. After the assessment has been made an Approval to Operate will be granted.

B. Summary Schedule

	Activity	Scheduled Beginning	Scheduled Completion
1.	Documentation and Interpretation of Geological and Reservoir Data (Oil and Minerals Division)	March 28,1975	Aug. 31, 1975
2.	Compilation of Reservoir and Geological Data (Industry)	March 28, 1975	Aug. 31, 1975
3.	Preparation of Guidelines for Industry by the Advisory Committee on Canadian Contents in Oil and Gas Operation on Canadian Lands	May 15, 1975	July 31, 1975
4.	Assessment of Industry's Geological and Reservoir Data	Aug. 31, 1975	Nov. 31, 1975
5.	Review of Preliminary Layout of Land Tenure	Oct. 13, 1975	Jan. 31, 1976
6.	Production Engineering and Updated Reservoir Studies	Nov. 31, 1975	June 15, 1977
7.	Production Engineering, Updated Reservoir Studies and Development Planning (Industry)	Oct. 15, 1975	Aug. 15, 1977
8.	Review of First Draft Land Tenure Agreement	March 15, 1976	April 5, 1976
9.	Design Engineering (Industry)	Oct. 15, 1975	June 15, 1977
10.	Review of Final Draft Land Tenure Agreement	April 12, 1976	May 17, 1976
11.	Review Process of Design Engineering	June 15, 1977	Dec. 15, 1977
12.	Assessment of Industry's Plan for Field Development	Aug. 15, 1977	Nov. 15, 1977
13.	Drill and Suspend Well Clusters (Industry)	Feb. 15, 1978	April 15, 1980
14.	On-Site Construction (Industry)	Oct. 15, 1979	June 15, 1980
15.	Field Inspection of Construction	Nov. 15, 1977	June 15, 1980
16.	Assessment, Inspection and On-Site Testing	June 15, 1980	July 15, 1980
17.	Submission of As-Built Drawings (Industry)	July 15, 1980	Oct. 15, 1980
18.	Review of As-Built Drawings	Oct. 15, 1980	Jan. 15, 1981

SOCIAL-CULTURAL-ECONOMIC ASSESSMENT (MADGAG)
(See Diagram B)

A. Activity Narratives

1. Preparation of Shortfall Statement

Written documentation presented to the proponents requesting information additional to their original proposal.

2. Compilation of Existing Base Data

Collection and organization of existing physical, social, cultural, and economic data from the following sources:

a) Territorial Government
b) Local Governments
c) Industry
d) Federal Government Departments
e) Consultants
f) Native Organizations

3. Gas Plant Visit

Visit to Calgary gas plant to gain knowledge of its operation so as to provide an understanding of same to residents of the assessment area.

4. Preparation for Regional Meeting I

Consists largely of the preparation of physical models, audio-visual materials and information kits on the nature of the proposed gas plants and the assessment process.

5. Analysis of Base Data

Interpretation of existing data to gain a deeper understanding of the inter-relationships between physical, social, cultural and economic factors.

6. Regional Meeting I

Meeting with representatives of local communities and native organizations to introduce the purpose, function, participants, plans, and future meetings of the various assessment groups and MADGAG in particular.

7. Preparation of Forecast

a) Based upon industry's response to specific questions from the shortfall statement, forecasts are calculated for the future demands of physical, social, cultural and economic facilities in the impact area.

b) In the absence of industry response, MADGAG is prepared to project two to three scenarios and calculate forecasts based upon these scenarios.

* 8. Alaska Visit

To observe the impact of the present activitiy of Alaskan hydrocarbon industry so as to prepare realistic recommendations to prevent potentially adverse influences of similar development in the Mackenzie Delta.

* 9. Preparation of Information Packages (Dialogue A)

Explanatory information on all physical, social, cultural and economic data as well as their interrelationships. This would consist largely of physical models, audio-visual and printed materials.

* 10. Meeting with Land Tenure, Environmental and Technical Assessment Groups

Meeting with all other assessment groups to ensure that all necessary materials are included in the information package for Regional Meeting II.

* 11. Regional Meeting II

Presentation of Dialogue A materials to the representatives of local communities and native organizations. Reactions and feedbacks to be received from them.

* Under review

* 12. General and Specific Objectives from N.W.T. Communities, N.W.T. Government and Regional Planning Group

The overall goals which the N.W.T. communities and the N.W.T. Government are striving to attain in the physical, social, cultural and economic developments of the MADGAG study area. These serve as guidelines for the preparation of alternative sets of terms and conditions and are to be consistent with the regional planning objectives.

* 13. Preparation of Alternatives (Dialogue B)

Explanatory information on the possible alternative terms and conditions evolved thus far, and discussion of their physical, social, cultural and economic implications. This would consist largely of physical models, audio-visual and printed materials.

* 14. Meeting with Land Tenure, Environmental and Technical Assessment Groups

Meeting with all other assessment groups to ensure that all the possible alternative terms and conditions governing the N.W.T. physical, social, cultural and economic developments are included in the information package for Regional Meeting III.

* 15. Regional Meeting III

Presentation of Dialogue B materials to the representatives of local communities and native organizations. Reactions and feedbacks to be received from them.

* 16. Review of Preliminary Layout of Land Tenure

Preliminary Layout of Land Tenure to be prepared by the D.I.N.A. Land Management Division, and to be reviewed by MADGAG and other assessment groups for specific types and forms of advisory inputs. The results of the review to be incorporated into the clauses and conditions of Land Tenure Agreement.

* 17. Draft Terms and Conditions

Clauses and conditions to be drafted in response to industry's proposal, so as to maximize the benefits and minimize the costs of physical, social, cultural and economic developments of N.W.T.

* Under review

* 18. Revision of Draft Terms and Conditions

Critical review of the draft terms and conditions by MADGAG.

* 19. Production of Documents

Printing of the documents containing the terms and conditions for the physical, social, cultural and economic developments of N.W.T.

* Under review

B. Summary Schedule

Activity	Scheduled Beginning	Scheduled Completion
1. Preparation of Shortfall Statement	March 1, 1975	March 31, 1975
2. Compilation of Existing Base Data	March 31, 1975	June 11, 1975
3. Gas Plant Visit	June 16, 1975	June 18, 1975
4. Preparation for Regional Meeting I	June 11, 1975	July 16, 1975
5. Analysis of Base Data	June 11, 1975	July 16, 1975
6. Regional Meeting I	July 16, 1975	July 23, 1975
7. Preparation of Forecast	July 16, 1975	Sept. 3, 1975
8. Alaska Visit	Sept. 3, 1975	Sept. 10, 1975
9. Preparation of Information Packages (Dialogue A)	Sept. 10, 1975	Oct. 1, 1975
10. Meeting with Land Tenure, Environmental and Technical Assessment Groups	Sept. 15, 1975	Sept. 19, 1975
11. Regional Meeting II	Oct. 1, 1975	Oct. 8, 1975
12. General and Specific Objectives from N.W.T. Communities, N.W.T. Government, and Regional Planning Group	Mar. 31, 1975	Oct. 8, 1975
13. Preparation of Alternatives (Dialogue B)	Oct. 8, 1975	Nov. 19, 1975
14. Meeting with Land Tenure, Environmental and Technical Assessment Groups	Nov. 5, 1975	Nov. 9, 1975
15. Regional Meeting III	Nov. 19, 1975	Nov. 26, 1975
16. Draft Terms and Conditions	Nov. 26, 1975	Dec. 10, 1975
17. Revision of Draft Terms and Conditions	Dec. 10, 1975	Dec. 17, 1975
18. Review of Preliminary Layout of Land Tenure	Oct. 13, 1975	Dec. 31, 1975
19. Production of Documents	Dec. 17, 1975	Dec. 31, 1975

ENVIRONMENTAL ASSESSMENT (See Diagram B)

A. Activity Narratives

1. Preliminary Environmental Impact Assessment

2. Environmental Impact Analysis Activity

In view of the fact that the project has already been submitted to Environmental Assessment Review Panel (E.A.R.P., a Preliminary Environmental Impact Statement is not necessary under E.A.R.P. Activity 1. and 2. are required, however:

- as staff work for the D.I.N.A. Environment Review Committee
- as a basis for involving the Regional staff and D.O.E.
- to be in a position to advise the Proponent on the response to the Environmental Guidelines
- to provide a starting point and framework for the (D.I.N.A.) Environmental Impact Assessment

3. Finalization of Environmental Guidelines (Environmental Assessment Review Panel)

Dr. Hill advises that recommendations on the Guidelines are expected by April 30, 1975. This will allow the E.A.R.P. to meet and finalize the Guidelines by May 31.

4. Prepare Environmental Impact Assessment

The preparation of the Environmental Impact Assessment will require extensive consultation with D.O.E. and with D.I.N.A.'s regional staff.

5. Draft Environmental Clauses for Land Tenure Agreement

a) The Environmental Clauses will be drafted as the impact assessment proceeds in consultation with the Land Management Division.

b) The above schedule is contingent on the availability of planned additional staff.

6. Review of Preliminary Layout of Land Tenure in Preparation of Environmental Clauses

Preliminary Layout of Land Tenure is reviewed, and required Environmental Clauses will be drafted and incorporated in the documents.

7. Revise Environmental Clauses

This will provide an opportunity to refine the Environmental Clauses in light of the completed Environmental Impact Assessment.

8. Review of Environmental Impact Assessment

Dr. Hill advises that two months will probably be sufficient to complete the assessment.

9. Prepare Final Environmental Clauses for Land Tenure Agreement

Approximately two weeks are being allowed to incorporate results of the E.A.R.P. assessment into the draft of the Environmental Clauses.

B. Summary Schedule

	Activity	Scheduled Beginning	Scheduled Completion
1.	Environmental Impact Analysis Activity		April 10, 1975
2.	Preliminary Environmental Impact Assessment	April 10, 1975	May 16, 1975
3.	Finalization of Environmental Guidelines (Environmental Assessment Review Panel)		May 31, 1975
4.	Prepare Environmental Impact Assessment	Sept. 1, 1975	March 1, 1976
5.	Draft Environmental Clauses for Land Tenure Agreement	Sept. 1, 1975	March 1, 1976
6.	Review of Preliminary Layout of Land Tenure in Preparation of Environmental Clauses	Oct. 13, 1975	March 1, 1976
7.	Revise Environmental Clauses	March 15, 1976	April 5, 1976
8.	Review of Environmental Impact Assessment (Environmental Assessment Review Panel)	March 1, 1976	May 1, 1976
9.	Prepare Final Environmental Clauses for Land Tenure Agreement	April 12, 1976	May 17, 1976

LAND TENURE AGREEMENT ASSESSMENT (See Diagram B)

A. Activity Narratives

1. Detailed Industry Application for Land Tenure

This includes the following materials:

a) Detailed location plans showing areas required for well clusters, gathering lines, plant sites, permanent roads, permanent staging areas and all other areas for which long term tenure will be required. They should be on orthophoto mapping at a scale of 1" : 1,000'.

b) Information required to determine the number and type of documents, authorities required, possible conflicts with other prior land interests, either private or governmental, etc.

c) Response to the Environmental Guidelines from D.I.N.A. This should be fairly complete with respect to environmental considerations and will include the results of geotechnical and hydrological studies to be conducted this summer.

d) Copies of the application will be sent to the D.I.N.A. Environmental committee for its preparation of Environmental Impact Assessment and Environmental Clauses for Land Tenure.

2. Review of Industry Application

The detailed industry application is examined for the preparation of Preliminary Layout of Land Tenure.

3. Prepare Preliminary Layout of Land Tenure

In the light of industry requirements and conflicts of land interests, documents in draft form, containing the standard legal and administrative requirements will be drawn up to form the base of the Land Tenure Agreement. These documents will have the layout for additional inputs from the Environmental, Socio-Economic (e.g. employment), and Technical sectors, so as to ensure the inclusion of all pertinent clauses and regulations.

4. Advisory Inputs for Preliminary Layout of Land Tenure

a) Copies of the Preliminary Layout will be sent to the Environmental, Socio-Economic and Technical Advisory Groups for inputs. The requests for inputs will outline the nature of documents and type and form of inputs to be required. These will be drafted into the Preliminary Layout of Land Tenure.

b) The Socio-Economic and Technical inputs are expected to be the first received along with filed comments regarding administrative sections.

c) The date for the receipt of Environmental input is critical. Environmental protection provisions are crucial in the preparation of final documents. The following actions to be taken are "fine-timed" to the receipt of this information.

5. Prepare First Draft Documents

a) Upon completion of the first draft documents, they will be circulated to the original Environmental, Socio-Economic and Technical Advisory Groups to ensure that concerns which have been identified since the original inputs are adequately covered.

b) A maximum of three weeks are allowed for the review of first draft documents by the Environmental, Socio-Economic and Technical Advisory Groups. If no comments are received within that time, the drafts are considered as accepted.

6. Prepare Final Draft Documents

a) Final draft documents are circulated to the original Environmental, Socio-Economic and Technical Advisory Groups to ensure that all requirements are adequately dealt with and gaps filled.

b) A maximum of five weeks only is allowed for review and comment. If no comments are received within this time period, the drafts are considered as accepted. More time is required here than for the first review because of the necessity to confirm environmental clauses with the Environmental Assessment and Review Panel.

7. Final Draft Revision

One week is allowed because of the typing requirements.

8. Prepare Submission to Cabinet

a) This date is critical to meet the deadline of December 31, 1976

b) The submission will request from Cabinet the authorities to grant licences, permits, and leases if necessary, depending on the acreages involved.

c) Final documents must be ready at this time to support if necessary, the submission.

9. Cabinet Examination of Submission

The submission and documents are considered by the Cabinet and will be ready for execution by December 31, 1976, if they are accepted and the required Orders-in-Council are passed.

B. Summary Schedule

Activity	SCHEDULED BEGINNING	SCHEDULED COMPLETION
1. Detailed Industry Application for Land Tenure		September 1, 1975
2. Review of Industry Application	September 1, 1975	September 15, 1975
3. Prepare Land Tenure Mock-Ups	September 15, 1975	October 13, 1975
4. Advisory Inputs for Preliminary Layout of Land Tenure		
a) Socio-Economic and Technical Inputs	October 13, 1975	January 5, 1976
b) Environmental Inputs	October 13, 1975	March 1, 1976
5. Prepare First Draft Documents	March 1, 1976	March 15, 1976
Advisory Inputs for First Draft Documents	March 15, 1976	April 5, 1976
6. Prepare Final Draft Documents	April 5, 1976	April 12, 1976
Advisory Inputs for Final Draft Documents	April 12, 1976	May 17, 1976
7. Final Draft Revision	May 17, 1976	May 24, 1976
8. Prepare Submission to Cabinet	May 24, 1976	May 31, 1976
9. Cabinet Examination of Submission	May 31, 1976	December 31, 1976

INDUSTRY ACTIVITY SCHEDULE (See Diagram B)

A. Activity Narratives

1. Compilation of Reservoir and Geological Data

Geological investigations and compilation of data necessary for production and reservoir engineering will occur. Existing data will be used to devise procedures and techniques for maximizing hydrocarbon recovery.

2. Detailed Response to Shortfall Statement

Response to specific questions from the shortfall statement prepared by the Social-Cultural-Economic Assessment Group (MADGAG)

3. Detailed Response to Environmental Guidelines

a) Mr. Mainland advises that the Proponent will submit the response to the Environmental Guidelines about the beginning of September. The response should be fairly complete with respect to environmental considerations and will include the results of geotechnical and hydrological studies to be conducted this summer.

b) For the purposes of the environmental impact analysis, the submission must include detailed, site specific geotechnical, hydrological and biological information. General engineering design information will also be required. It is presumed that detailed engineering design information would not be required until later, in response to clauses in the Land Tenure Agreement. Discussion with Mr. Mainland suggests that this would be consistent with the Proponent's plans.

c) The material submitted by the Proponent to date includes a good, general description of the development. The environmental material provided consists mainly of biological data obtained over three years by the consultants in the area of the development. However, the material is inadequate. More site specific data and comprehensive information on fish resource is required. There should also be the incorporation of data available from other sources, e.g. D.O.E..

d) There is probably enough general environmental information available for the Delta area. The remaining requirements are mainly for detailed, site-specific data.

4. Prepare Advisory Inputs for Preliminary Layout of Land Tenure

Preliminary layout of Land Tenure is prepared by the D.I.N.A. Land Management Division, and is reviewed by the proponents for advisory inputs.

5. Prepare Advisory Inputs for First Draft Land Tenure Agreement

First draft Land Tenure Agreement is prepared by the D.I.N.A. Land Management Division, and is reviewed by the proponents for advisory inputs.

6. Production Engineering, Updated Reservoir and Development Planning

Development of techniques and methods for resource exploitation. Studies to achieve maximum hydrocarbon recovery by using the most economical, efficient and safest equipment, facilities and sound engineering practices will be undertaken.

7. Design Engineering

Design engineering includes the design of components in detail with final engineering drawings. The design of the pipeline, gas processing plants and associated support facilities will be involved.

B. Summary Schedule

Activity	Scheduled Beginning	Scheduled Completion
1. Compilation of Reservoir and Geological Data	March 28, 1975	Aug. 31, 1975
2. Detailed Response to Shortfall Statement	March 31, 1975	July 16, 1975
3. Detailed Response to Environmental Guidelines	May 31, 1975	Sept. 1, 1975
4. Prepare Advisory Inputs for Preliminary Layout of Land Tenure	Oct. 13, 1975	March 1,1976
5. Prepare Advisory Inputs for First Draft Land Tenure Agreement	March 15, 1976	April 5, 1976
6. Production Engineering, Updated Reservoir and Development Planning	Oct. 15, 1975	Aug. 15, 1977
7. Design Engineering	Oct. 15, 1975	June 15, 1977

IV. EXOGENOUS ACTIVITIES

A wide range of planning and assessment activities are external to the Gas Gathering System Project but may affect its progress. These are termed - exogenous activities and are shown in Diagram E. Exogenous assessment activities include National Energy Board hearings of the Canadian Arctic Gas Supply Limited and Foothills - gas pipeline applications as well as the Berger Enquiry hearings. Exogenous planning activities include plans for the Canadian Arctic Gas Supply Limited gas pipeline, the Foothills gas pipeline, the Beaufort Crude Transportation System, and Offshore Drilling.

V. MAJOR DECISION POINTS AND CRITICAL PATHS

Diagram B illustrates the major decision points (red dots) and critical paths (red lines) associated with the project. One critical path has been identified in each assessment area. Over the period to December 31, 1976, five major decision points have been identified from the overall assessment network. There are four additional major decision points associated with the Technical Assessment (Diagram C) over the period from December 31, 1976 to December 31, 1981.

In identifying major decision points, we have attempted to isolate points in time where the number of options is significantly and irrevocably reduced. The following lists the major decision points along with a brief explanation for each of them:

Major Decision Points

Socio-Cultural-Economic Assessment Schedule (Diagram B)

1. After meeting with the representatives from the local communities, native organizations, and DINA's Technical and Environmental groups, possible alternatives and their physical, social, cultural and economic impacts will be discussed and decided upon.

2. After discussing possible alternatives with the representatives from the local communities, native organizations, and D.I.N.A.'s Technical, Environmental, and Land Tenure Assessment Groups, clauses and conditions will be drafted in response to Industry's proposal, so as to maximize the benefits and minimize the costs of the physical, social, cultural and economic development of N.W.T.

Land Tenure Assessment Schedule (Diagram B)

3. In response to Industry's specific requirements regarding land use and possible conflicts of land interests, appropriate legal and administrative requirements must be decided upon so as to draw up the Preliminary Layout of Land Tenure.

4. After receipt of the environmental and technical inputs from the relevant assessment groups, draft Land Tenure documents will be prepared and then circulated to the Environmental, Socio-Economic-Cultural and Technical Advisory Groups for further revision.

5. The submission of the final Land Tenure draft to the Cabinet will request authorities for issuing licenses, permits and leases prior to execution of the Land Tenure documents.

Technical Assessment Schedule (Diagram C)

6. An Approval to Drill will be granted to Industry after the assessment of Industry's Development Plan. This assessment ensures that the gas fields are exploited in such a way so as to obtain maximum ultimate recovery in a safe, economical and efficient manner..

7. An Approval to Construct will be issued upon completion of the review of Industry's engineering drawings regarding the pipeline, gas processing plants and associated facilities.

8. A Provisional Approval to Operate will be given upon completion of testing and inspection of the plant site.

9. An Approval to Operate will be granted after the assessment of the drawings of existing structures to ensure that changes are properly indicated and verified.

VI INFORMATION

FOR

PROJECT CO-ORDINATION

1. Introduction

This section sets out details of a system for ongoing co-ordination of the Mackenzie Delta Gas Gathering System Project. It identifies the information required for project management and also for participants.

In what follows, these information needs are spelled out along with procedures for information collection, assimilation, display and transmission.

2. Requirements

Each project participant and the project manager will receive the same information for project co-ordination purposes. Essentially this information serves two needs; it provides an indication of actual progress and it provides a basis for readjusting the plan from time to time as a result of delays, plan changes and exogenous events. Accordingly two types of information are required:

a) Progress Information:
This information registers actual progress against the plan. Simple monitoring of the actual timing of major linkages and decisions points will serve this purpose.

b) Forward Planning Information:
This information provides an advance indication of proposed plan changes and provides a basis for effecting agreed changes to the plan.

3. Collection

Progress and forward planning information will be collected informally through telephone or personal contact at monthly intervals, or in the case of progress information just prior to the timing of major linkages and decisions points, depending on whichever is more frequent.

4. Assimilation

Progress information will be recorded against the chart "Major Linkages and Decision Points" (Diagram D).

Proposed plan changes will be sketched onto the project plan along with any consequent plan adjustments. These changes will be vetted by the project manager and if major, may form the basis of discussions with affected participants. Once plan changes have been approved by the Project Manager, they will be incorporated into a revised project plan.

5. Display

Progress will be reflected in the periodic updating of the project plan. Plan changes will be highlighted by rough coloured markings on copies of the unrevised project plan and once approved, will be incorporated into the revised plan.

6. Transmission

Progress information will be passed to the project manager as it is collected. Plan changes and progress information will be transmitted to all participants by issue of the revised plans and associated narratives and will be dealt with on a monthly basis in general, unless circumstances dictate more timely consideration.

Note: Detailed procedures for carrying out the above functions are set out in Appendix III.

APPENDICES

APPENDIX I

Mackenzie Delta Gas Gathering System
Project Organization

The following organization charts illustrate the organization structure of the different groups involved in the Mackenzie Delta Gas Gathering System Project.

Figure 2 illustrates the overall organization of the project and consists of the Proponents and the Government Assessment Groups.

Figure 3, the Mackenzie Delta Gas Gathering System Assessment Group organization chart illustrates the Government Departments and personnel involved. D.I.N.A. is responsible for the overall assessment of the applicants' proposal to construct a Gas Gathering System. The N.W.T. is responsible for the Social-Cultural-Economic assessment while D.I.N.A. is primarily responsible for the Environmental-Technical assessment.

Figures 4, 5, and 6, the Gulf Oil, Shell Oil and Imperial Oil organization charts identify each applicant and their personnel responsible for the Social-Cultural-Economic, Environmental and Technical areas of the project.

FIGURE 2

Mackenzie Delta Gas Gathering System

Overall Project Organization

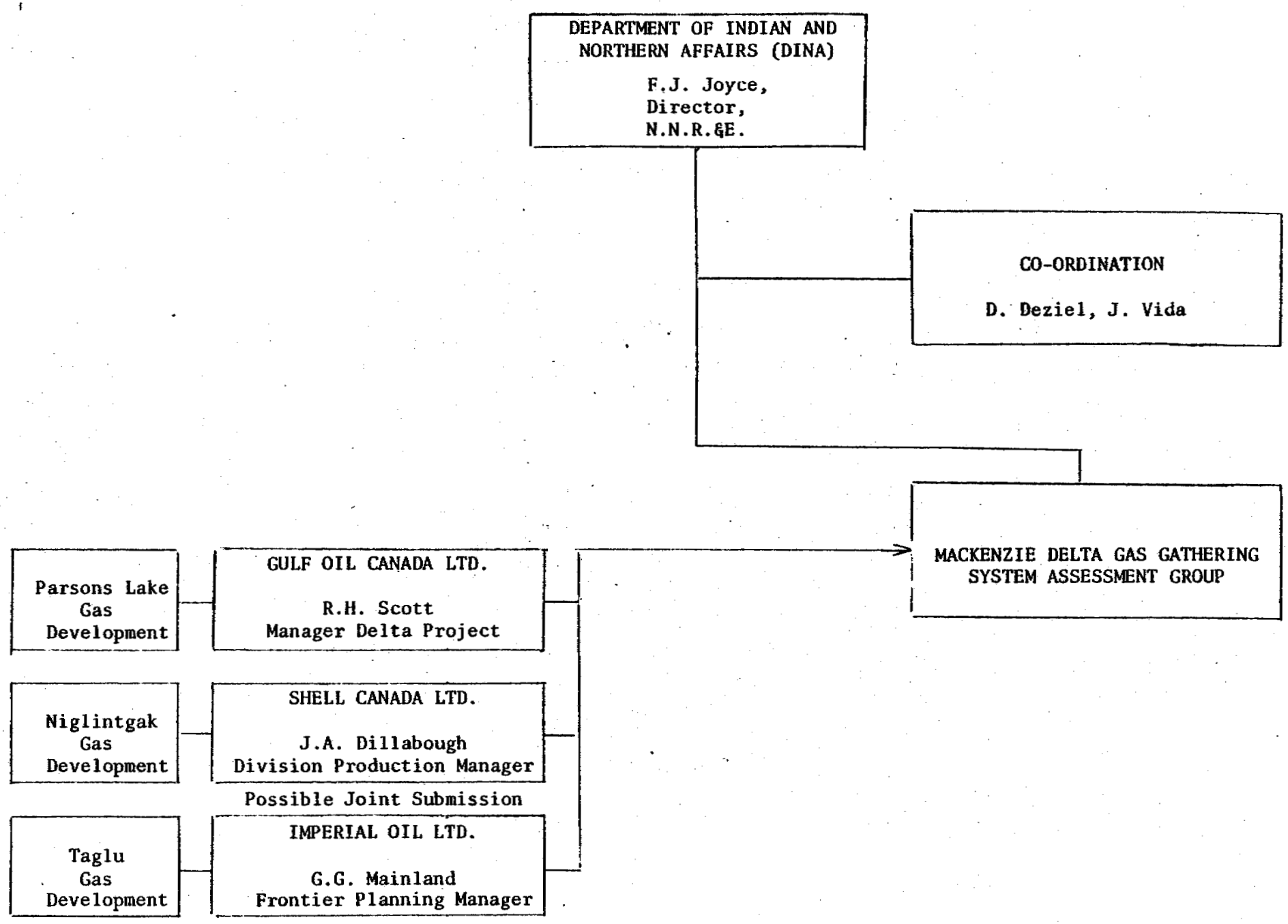


FIGURE 3

MACKENZIE DELTA GAS GATHERING SYSTEM ASSESSMENT GROUP

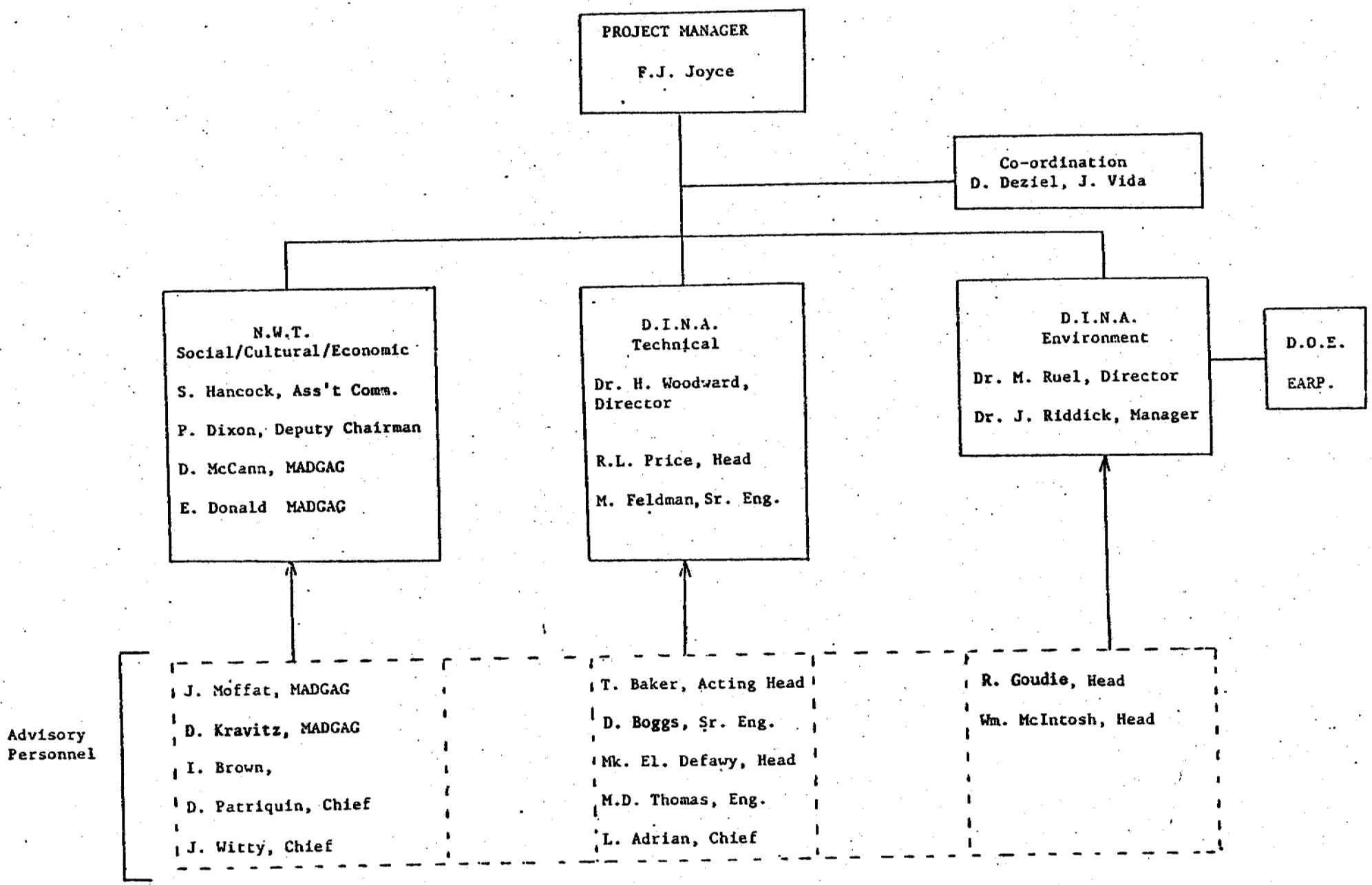


FIGURE 4

GULF OIL CANADA LTD.
PARSONS LAKE GAS DEVELOPMENT
ORGANIZATION CHART

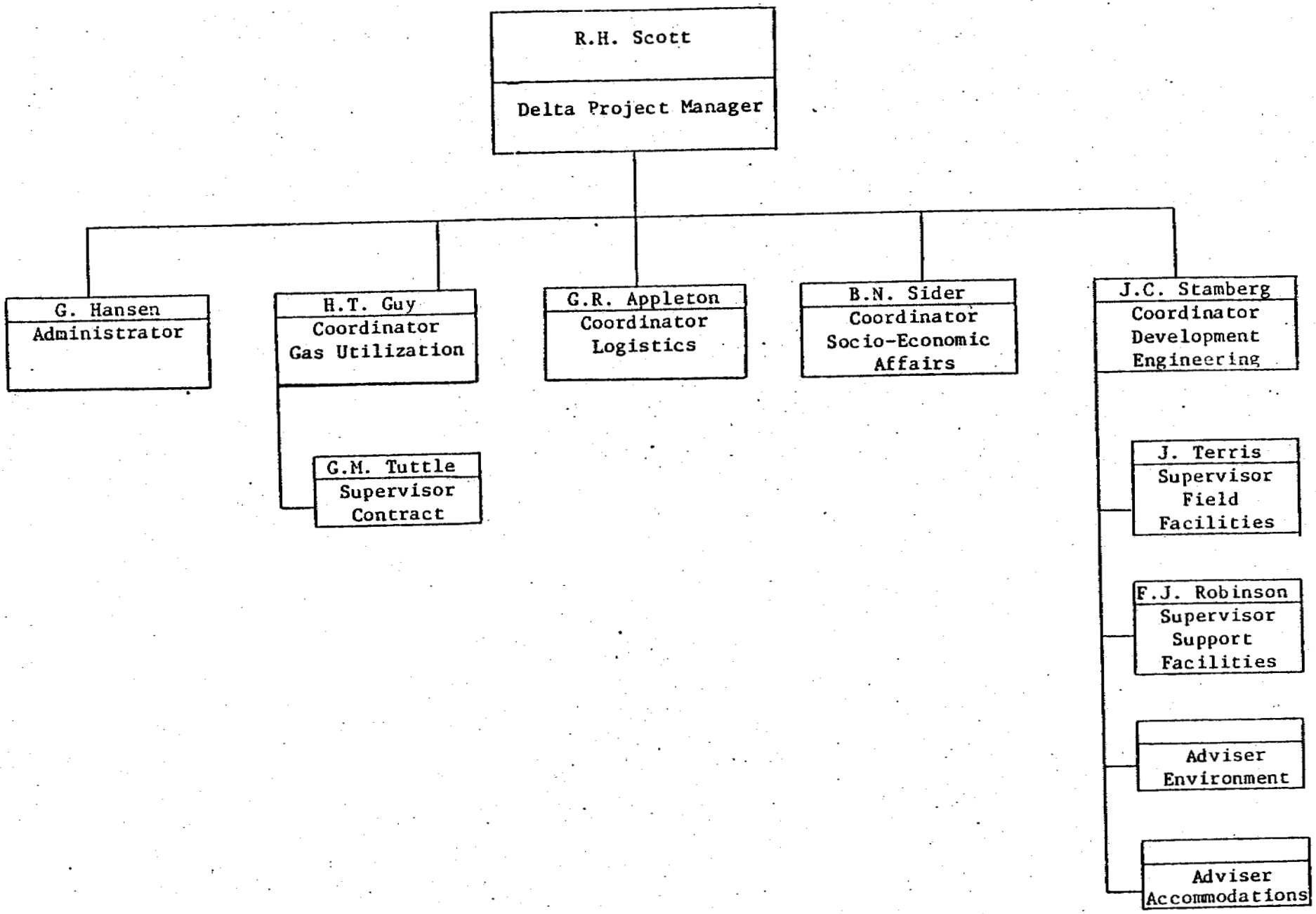


FIGURE 5

SHELL CANADA LIMITED

NIGLINTGAK GAS DEVELOPMENT

ORGANIZATION CHART

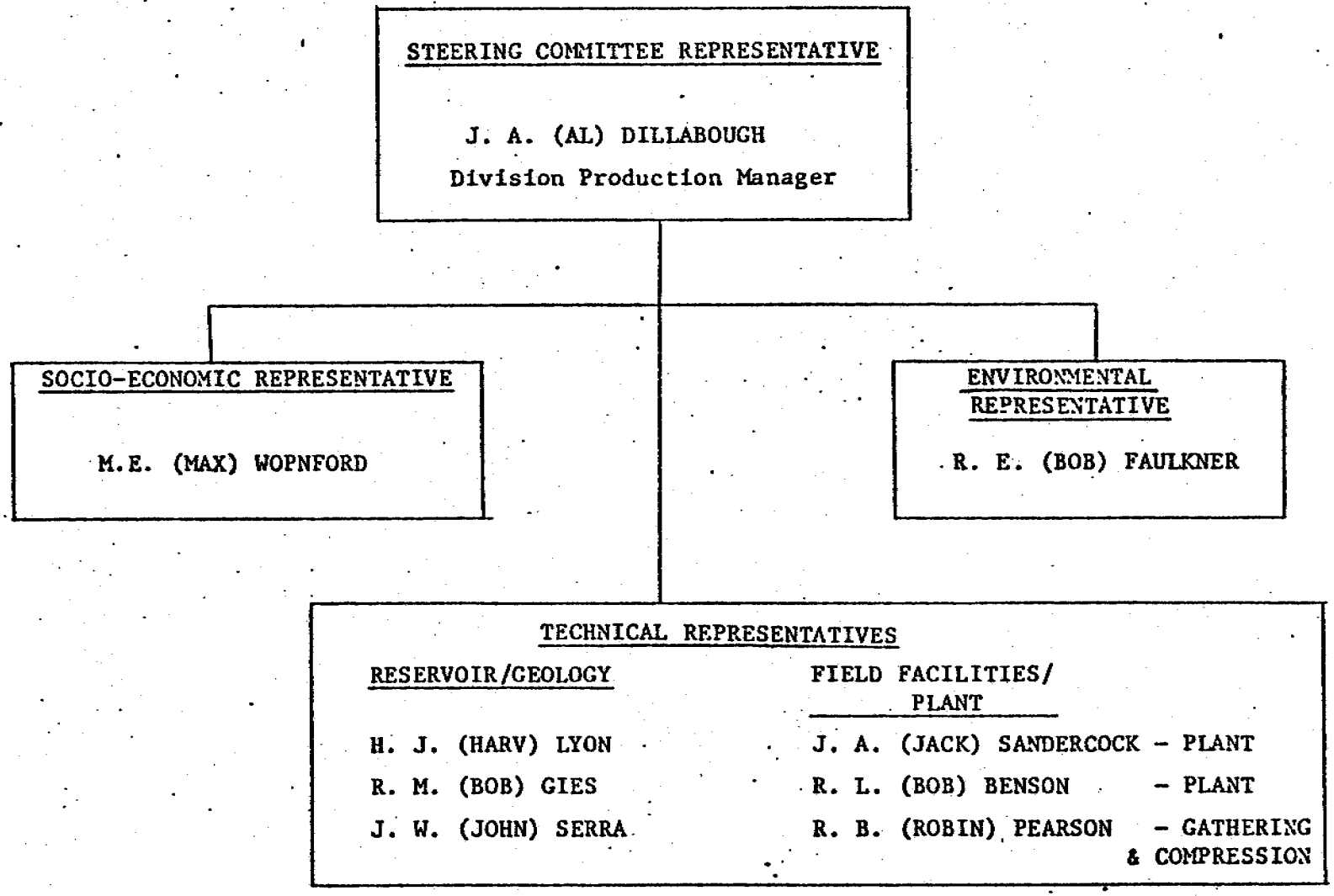
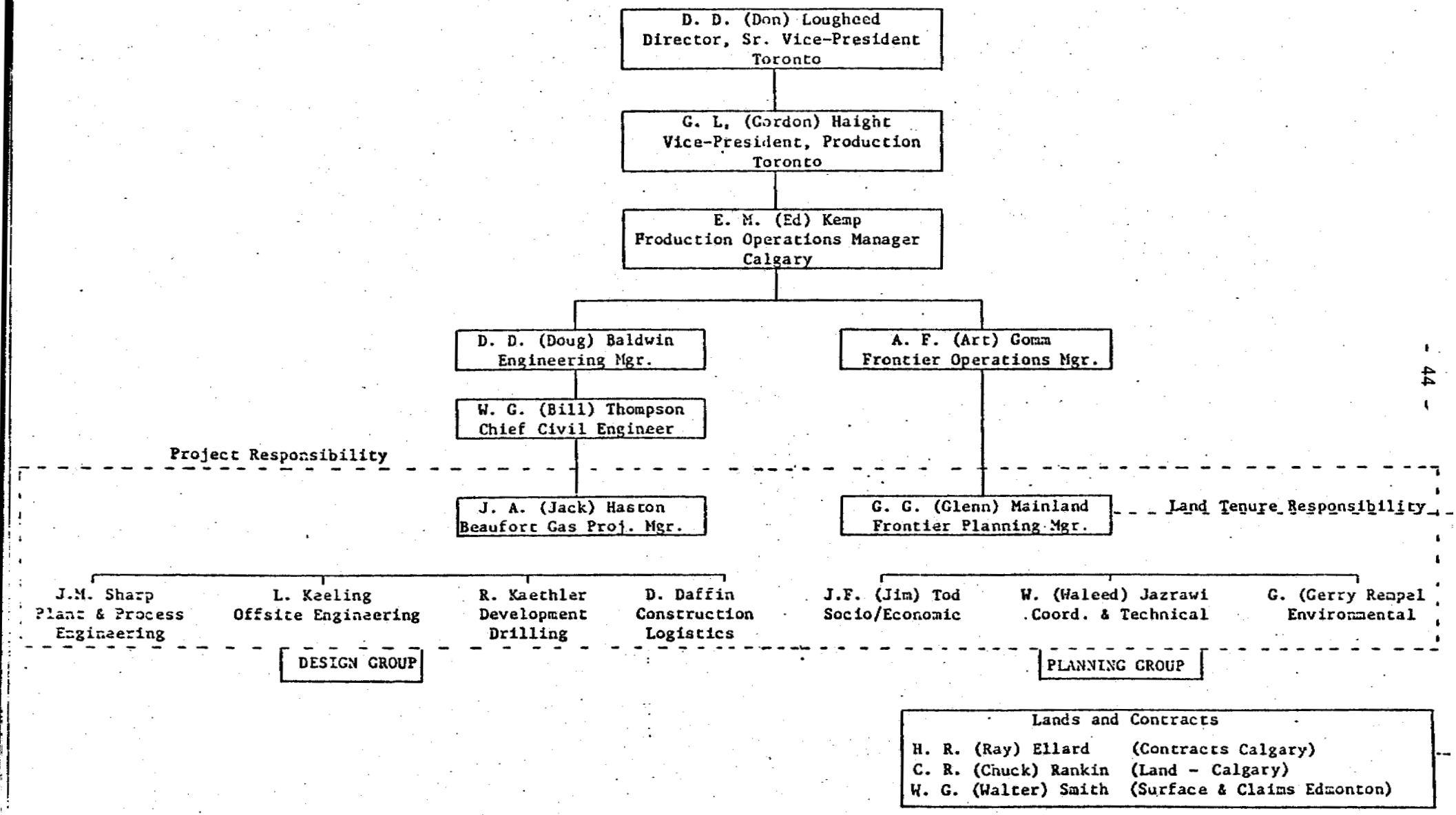


Figure 6

IMPERIAL OIL LIMITED

TAGLU GAS DEVELOPMENT

ORGANIZATION CHART



APPENDIX II

Project Directory to Participants of

Mackenzie Delta Gas Gathering System Project

Addresses of Main Project Participants

D.I.N.A.,
Centennial Tower,
400 Laurier Avenue W.,
Ottawa, Ontario.
K1A OH4

G.N.W.T.,
Yellowknife, N.W.T.
or
G.N.W.T.,
Frobisher Bay, N.W.T.

Gulf Oil Canada Ltd.,
500 - 4th Avenue,
Calgary, Alberta.

Shell Oil Canada Ltd.,
639 - 5th Avenue S.W.,
Calgary, Alberta.
T2P 2K3

Imperial Oil Ltd.,
500 - Sixth Avenue S.W.,
Calgary, Alberta.
T2P OS1

NAME	JOB TITLE	ADDRESS	TELEPHONE
Adrian L.	Fire Chief	N.W.T., Yellowknife.	(403) 873-7428
Appleton G.R.	Co-ordinator Logistics	Gulf Oil Calgary.	(403) 268-1965
Baker T.	Acting Head, Reservoir Engineering Unit, Oil and Gas Drilling and Conservation Section.	D.I.N.A. Ottawa.	(613) 995-7667
Benson R.L.	Gas Processing Technical Matters	Shell Canada Calgary	(403) 261-3600
Boggs D.	Sr. Engineer, Reservoir Engineering Unit, Oil and Gas Drilling and Conservation Section.	D.I.N.A. Ottawa	(613) 992-6467
Brown I.	Man Force Research Associates, External Consultants Employment.	Edmonton, Alberta.	(403) 439-3193
Daffin D.	Construction Logistics	Imperial Oil Calgary	(403) 267-1110
Deziel D.	Project Co-ordination	D.I.N.A. Ottawa	(613) 996-3896
Dillabough J.A.	Division Project Manager	Shell Canada Calgary	(403) 261-3600
Dixon P.	Deputy Chairman, M.A.D.G.A.G.	N.W.T. Yellowknife	(403) 873-7240
Donald E.	Social Development and Education, M.A.D.G.A.G.	N.W.T. Yellowknife	(403) 873-2411
El. Defrawy Mk.	Head, Drilling and Completion Engineering Unit, Oil and Gas Drilling and Conservation Section.	D.I.N.A. Ottawa	(613) 992-6467

NAME	JOB TITLE	ADDRESS	TELEPHONE
Elland H.R.	Contractor	Imperial Oil Calgary	(403) 267-1110
Faulkner R.E.	Environmental Matters and Technical Matters	Shell Canada Calgary	(403) 261-3600
Feldman M.	Senior Production Engineer Production Systems Unit, Oil and Gas Drilling and Conservation Section.	D.I.N.A. Ottawa	(613) 995-6467
Gainer G.	Corporate Co-ordinator, Environmental Affairs.	Gulf Oil, Calgary	(403) 268-1965
Gies R.M.	Reservoir/Geology	Shell Canada Calgary	(403) 261-3600
Goudie R.	Head, Land Administration Section.	D.I.N.A. Ottawa	(613) 992-2534
Guy H.T.	Processing Plants	Gulf Canada Calgary	(403) 268-1965
Hansen G.	Administrator	Gulf Canada Calgary	(403) 268-1965
Hancock S.	Assistant Commissioner	N.W.T. Yellowknife	(403) 873-2611
Haston J.A.	Project Manager, Beaufort Gas Plant.	Imperial Oil Calgary	(403) 267-1110
Joyce F.J.	Director, Northern Natural Resources and Environment.	D.I.N.A. Ottawa	(613) 996-3896
Jazrawi W.	Frontier Planning	Imperial Oil Calgary	(403) 267-1110
Kaethler R.	Development Drilling	Imperial Oil Calgary	(403) 267-1110
Keeling L.	Project Engineer	Imperial Oil Calgary	(403) 267-1110

NAME	JOB TITLE	ADDRESS	TELEPHONE
Kravitz D.	Local Government, M.A.D.G.A.G.	N.W.T. Yellowknife	(403) 873-7428
Lyon H.J.	Reservoir/Geology	Shell Canada Calgary	(403) 261-3600
Mainland G.	Director, Frontier Planning and Operation.	Imperial Oil Calgary	(403) 267-1110
McCann D.	Local Government Town Planning and Land Administration.	N.W.T. Yellowknife	(403) 873-2411
McIntosh W .	Head, Operation and Land Transactions Unit.	D.I.N.A. Ottawa	(613) 992-6400
Moffat J.	Assistant Supervisor, Special Education and Continuing Education.	N.W.T. Frobisher Bay	(819) 979-5236
Patriquin D.	Chief, Research and Evaluation Division, Economic Development.	N.W.T. Yellowknife	(403) 873-7318
Pearson R.B.	Gas Gathering Technical Matters	Shell Canada Calgary	(403) 261-3600
Price R.	Head, Production Systems Unit, Oil and Gas Drilling and Conservation Section.	D.I.N.A. Ottawa	(613) 996-1278
Rankin C.R.	Land	Imperial Oil Calgary	(403) 267-1110
Rempel G.	Environmental	Imperial Oil Calgary	(403) 267-1110
Riddick J.	Manager, Arctic Land Use Research Section.	D.I.N.A. Ottawa	(613) 992-0121
Robinson F.J.	Supervisor, Support Facilities.	Gulf Oil Canada Calgary	(403) 268-1965

NAME	JOB TITLE	ADDRESS	TELEPHONE
Ruel M.	Director, Water, Lands, Forests, and Environment.	D.I.N.A. Ottawa	(613) 995-6025
Sandercock J.A.	Plant	Shell Canada Calgary	(403) 261-3600
Scher J.A.	I.O.L. Consultant	Imperial Oil Calgary	(403) 267-1110
Scott R.H.	Delta Project Manager	Gulf Canada Calgary	(403) 268-1965
Serra	Reservoir/Geology	Shell Canada Calgary	(403) 261-3600
Sharp J.M.	Project Engineer	Imperial Oil Calgary	(403) 267-1110
Sider B.N.	Economic-Social	Gulf Canada Calgary	(403) 268-1965
Smith W.G.	Surface and Claims	Imperial Oil Edmonton	(403) 423-8110
Stamberg J.C.	Head, Development Engineering-Environmental	Gulf Oil Calgary	(403) 268-1965
Terris J.	Supervisor, Support Facilities.	Gulf Oil Calgary	(403) 268-1965
Thomas M.D.	Regional Conservation Engineer.	D.I.N.A. N.W.T. Yellowknife	(403) 873-7428
Tod J.F.	Operations Engineering	Imperial Oil	(403) 267-1110
Tuttle G.M.	Supervisor	Gulf Oil Calgary	(403) 268-1965
Vida J.	Co-ordination	D.I.N.A. Ottawa	(613) 996-3896

NAME	JOB TITLE	ADDRESS	TELEPHONE
Witty J.	Chief, Employment Division, Department of Local Governments	N.W.T. Yellowknife	(403) 873-8003
Woodward H.	Director, Oil and Minerals Branch.	D.I.N.A. Ottawa	(613) 992-9402
Wopnford M.E.	Socio-Economic Matters	Shell Canada Calgary	(403) 261-3600

APPENDIX III

Detailed Procedures For Information Co-ordination

The following outlines detailed procedures to be carried out by the information co-ordinator:

1. Check the chart "Major Decision Points and Major Linkages" (Diagram D) weekly.

2. Collect progress and forward planning information from responsible participants one week before each major decision point or major linkage.

3. Relay progress information to the project manager and each participant and record in Form I.

4. Record forward planning information in Form II. Make final changes on copies of the unrevised project plan by rough coloured markings. Inform the project manager and all participants on minor changes that do not affect the overall project plan. Relay major changes that will affect the overall project plan to the project manager and all participants for their agreement.

5. Once agreement on major changes has been reached, send dated copies of the revised project plan along with the associated narratives to all participants.

6. Contact responsible participants one week after each major decision point or major linkage to confirm that it has taken place.

7. Whenever forward planning changes occur prior to the scheduled information collection date, revise the project plan according to steps 4, 5 and 6 of the above procedures.

FORM I - RECORD OF PROJECT PROGRESS

Current Major Decision Points and Major Linkages (Responsible Participants)	Scheduled Date	Changes From Schedule		Rescheduled Date	Confirmation of Activity Completion	Remarks
		No	Yes (See Form II)			

FORM II - RECORD OF PROJECT PLAN CHANGES

Current Major Decision Points and Major Linkages (Responsible Participants)	Scheduled Date	Proposed Changes	Confirmed Changes	Remarks

List of Participants for Information Co-ordination

Activity	Director	Information Contacts
Environmental Assessment	M.J. Ruel 995 - 6025	J. Riddick 992 - 0121
Land Tenure Agreement	M.J. Ruel 995 - 6025	W.F. McIntosh 992 - 6400
Technical Assessment	H.W. Woodward 992 - 9402	R.L. Price 992 - 9383
Industry Technical Planning		
Imperial Oil (Calgary)	G.G. Mainland 403 267-1110	G.G. Mainland
Shell Canada (Calgary)	R.E. Faulkner 403 261-3600	R.E. Faulkner
Gulf Canada (Calgary)	J.C. Stamberg 403 268-1749	J.C. Stamberg

EXHIBITS

Diagram A	Technical Plan
Diagram B	Mackenzie Delta Gas Gathering System Project Plan
Diagram C	Mackenzie Delta Gas Gathering System Technical Assessment Schedule
Diagram D	Mackenzie Delta Gas Gathering System Major Linkages, Decision Points and Exogenous Activities
Diagram E	Exogenous Planning and Assessment Activities

DIAGRAM C (SEPTEMBER '75 / NEXT REVISION: OCT '15)

MACKENZIE DELTA GAS GATHERING SYSTEM — TECHNICAL ASSESSMENT SCHEDULE

— CRITICAL PATH
● MAJOR DECISION POINTS

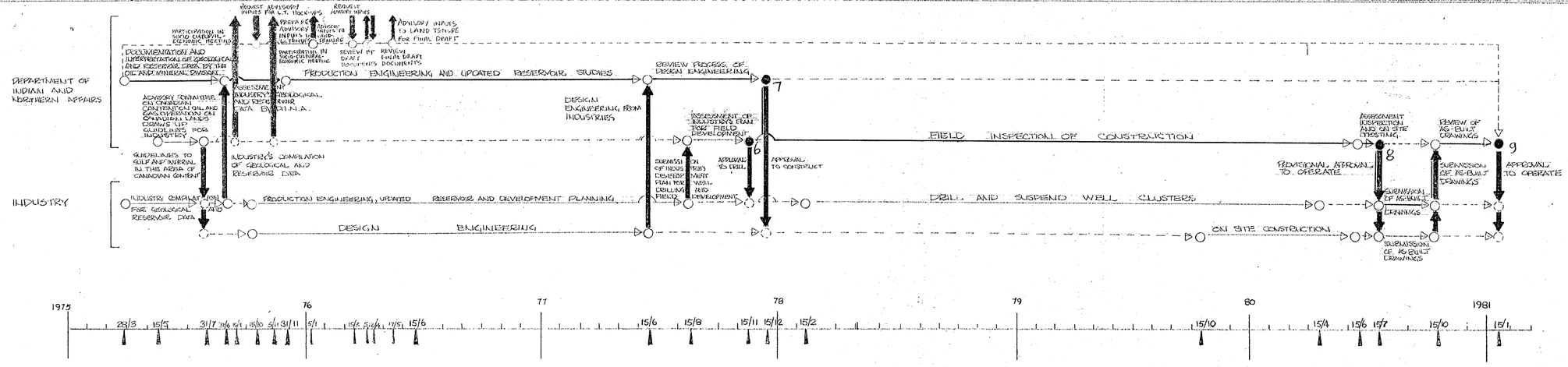


DIAGRAM B

MACKENZIE DELTA GAS GATHERING SYSTEM PROJECT PLAN

SEPTEMBER '75
(NEXT REVISION OCTOBER '75)

— CRITICAL PATH
● MAJOR DECISION POINTS

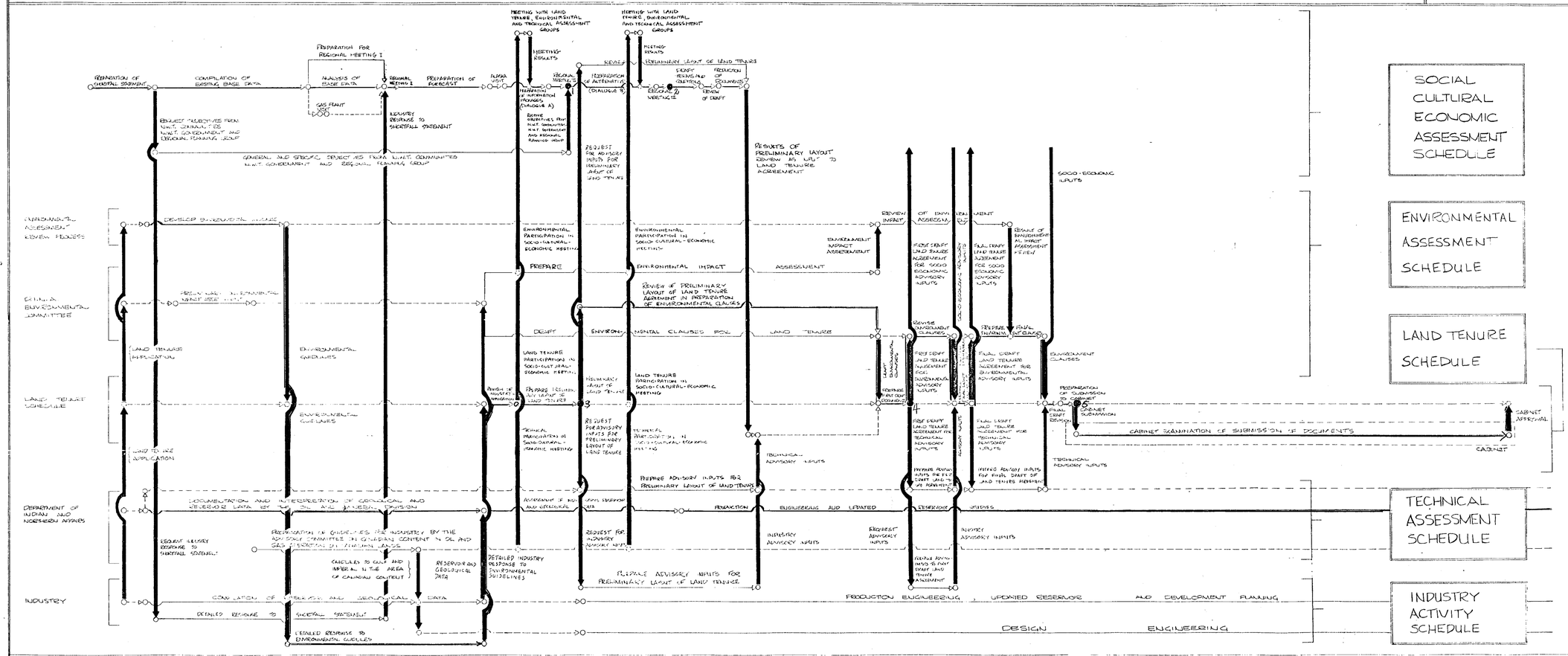


DIAGRAM A

MACKENZIE DELTA GAS GATHERING SYSTEM
TECHNICAL PLANNING SCHEDULE (IMPERIAL)

(SEPTEMBER '75)

(NEXT REVISION: OCTOBER '75)

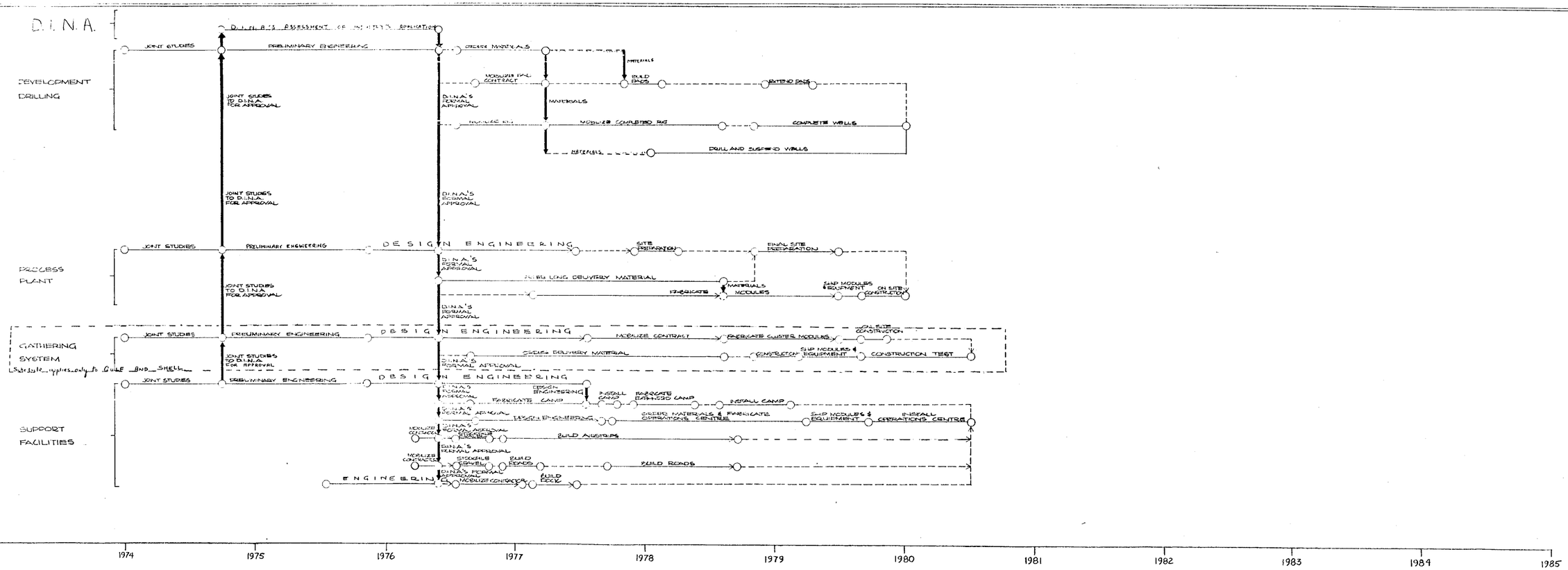


DIAGRAM D

MACKENZIE DELTA GAS GATHERING SYSTEM

MAJOR LINKAGES, DECISION POINTS AND EXOGENOUS ACTIVITIES

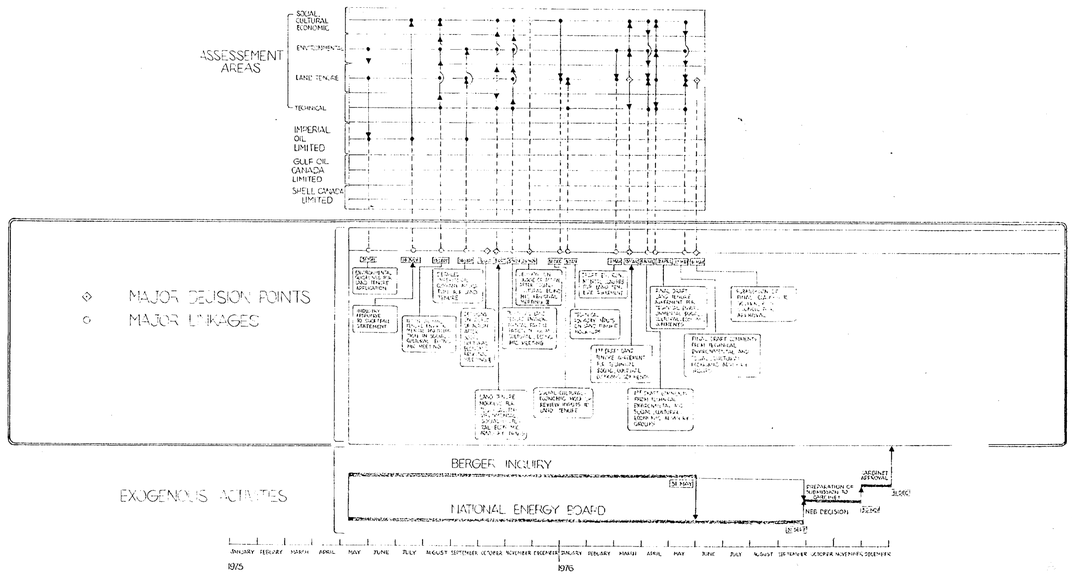


DIAGRAM E EXOGENOUS ACTIVITIES

SEPTEMBER '75

ACTIVITIES RELATED TO THE MACKENZIE DELTA GAS GATHERING SYSTEM