

## 1 INTRODUCTION

### 1.1 Purpose of the Volume

This volume presents the findings of the socio-economic impact assessment completed for the project. The purpose of this volume is to:

- explain the ways in which the project might affect socio-economic resources
- predict the effects on those resources
- assess whether those effects might be significant

This volume also:

- informs communities about how the project could affect them through changes to socio-economic resources
- informs regulators about the effects of the project on socio-economic resources
- provides information to technical reviewers who are interested in details of the assessment process and results

The focus in this volume is on identifying and optimizing the economic and social effects of the project on the study area communities and regions. Table 1-1 shows the six types and 22 subtypes of project effects identified and described in this volume. Analyses of the effect pathways and relevant indicators are presented, followed by descriptions of the various project socio-economic effects, after general mitigation measures have been applied.

With general mitigation measures in place, management of continuing effects, through additional mitigation measures, will be the shared responsibility of:

- the project proponents
- governments
- local communities
- individuals

Each section contains additional mitigation measures that the project proponents will apply and those suggesting action by governments and local communities. Finally, the expected residual effects are described, assuming that the mitigation measures have been implemented.

Cumulative effects are considered in Section 9, Cumulative Effects. Once construction begins, it is important to monitor effects to determine if they are being effectively managed. The ways in which the effects will be monitored are described in Section 10, Monitoring and Follow-up.

**Table 1-1: Types and Subtypes of Socio-Economic Effects**

<b>Type of Effect</b>	<b>Subtypes of Effects</b>
Economic effects (Sections 2 and 3)	<ul style="list-style-type: none"> <li>• Procurement, employment and regional economics</li> <li>• National economics</li> <li>• Demography</li> </ul>
Infrastructure and community services (Section 4)	<ul style="list-style-type: none"> <li>• Transportation and use</li> <li>• Energy and utilities</li> <li>• Housing</li> <li>• Recreation resources</li> <li>• Governance</li> </ul>
Individual, family and community wellness (Section 5)	<ul style="list-style-type: none"> <li>• Community well-being and delivery of social services</li> <li>• Health conditions and health care services</li> <li>• Human health risks</li> <li>• Public safety and protection services</li> <li>• Education attainment and services</li> </ul>
Traditional culture (Section 6)	<ul style="list-style-type: none"> <li>• Traditional harvesting and land use</li> <li>• Preservation of traditional language and culture</li> </ul>
Nontraditional land and resource use (Section 7)	<ul style="list-style-type: none"> <li>• Nontraditional land and resource use</li> <li>• Protected areas</li> <li>• Visual and aesthetic resources</li> </ul>
Heritage resources (Section 8)	<ul style="list-style-type: none"> <li>• Historical resources</li> <li>• Cultural resources</li> <li>• Archaeological resources</li> <li>• Palaeontological resources</li> </ul>

### **Relationship to Other Volumes**

This volume is the sixth of eight volumes in the environmental impact statement (EIS). The following describes the key purpose of each volume to show how Volume 6 relates to it:

- Volume 1, Overview and Impact Summary, describes the administrative and regulatory framework for the impact assessment, along with a concordance table to the Terms of Reference for the EIS. It provides details of the approach and method used to prepare the assessment. The traditional knowledge (TK) collection program, and how TK and information from public consultation are used in the assessment are also described. Volume 1 contains a summary of the findings of Volume 5, Biophysical Impact Assessment and Volume 6, Socio-Economic Impact Assessment.

- Volume 2, Project Description, describes the project components and phases. The impact assessment is based on the best engineering definition available when quantitative analyses were completed. Updated detailed engineering information about project components, including access roads, borrow sites and barge landings, is included in Volume 2. Engineering design will continue to evolve during the public consultation and project permitting phases of the regulatory process. A more detailed project definition will be included in the project permit applications.
- Volume 3, Biophysical Baseline, contains information about the existing biophysical environment at present (2004). It includes information from literature and the results of project field studies.
- Volume 4, Socio-Economic Baseline, contains information about the current (2004) social, economic and cultural conditions of the communities and people that might be affected by the project
- Volume 5, Biophysical Impact Assessment, provides the assessment of predicted effects of the project on biophysical resources
- Volume 7, Environmental Management, contains details of the environmental management plans and mitigation measures that will be incorporated in the project. The prediction of effects presented in Volume 5 and in Volume 6 is based on the assumption that those mitigation measures will be incorporated in the project.
- Volume 8, Environmental Alignment Sheets, presents the project-related environmental alignment sheets

## 1.2 Context for the Analysis

Although the issue assessments are based on verified published data and reflect documented opinions of community members gathered through the public participation program, and discussions with regional and local public service delivery personnel, socio-economic impact assessments are, by nature, subjective. Both groups and individuals, whether trained social scientists or not, have valid but varied and variable opinions on the importance of individual key issue findings and what they mean for a collective expression of a given community's state of well-being.

This dependence on variable public attitudes, combined with the natural defensiveness people feel about *outsiders* describing their living circumstances, particularly problem social conditions, and predicting how they will perceive certain effects, makes this qualitative analysis necessary, but challenging.

To help predict the specific aspects of the socio-economic conditions that might change because of project influences, two general types of indicators were used:

- those that reflect the benefits of project effects, e.g., economic indicators such as employment and income
- those that reflect adverse effects, e.g., social indicators such as health and wellness conditions and services

The approach for the assessment was to first estimate the economic effects and then to predict how the economic changes would affect public services and social conditions. Economic benefits generally have the positive result of increased employment and income for individuals and increased revenue for governments. Increasing public service and changing social conditions typically involve increased fiscal and societal costs, and often attract public and reviewer attention because they demonstrate the risks associated with the benefits. The social analysis sets the project effects against the existing chronic social problems described in Volume 4, Socio-Economic Baseline. The project is expected to have only a marginal and short-term adverse effect on existing problems, and the opportunities for the project proponents to reduce the problems unilaterally are limited. It will take a concerted and cooperative effort of government, communities and project proponents to address the problems.

The general findings in this volume have been reviewed with local and regional leaders and the public. The effects assessment and mitigation round of community public participation sessions provided the opportunity to test the most important of the impact hypotheses and mitigation recommendations. This process is described and the results summarized in Volume 1, Section 4, Public Participation.

Summaries of the key indicator data are included in this volume as context for the assessment. Relevant sections of Volume 4, Socio-Economic Baseline, are referred to, but the detailed baseline data has not been repeated. In addition, the heritage resources baseline data is included in this volume as it reflects the substantial field studies results, which are essential to support the overview assessment. A detailed heritage resources impact assessment will be done once a right-of-way centreline and final sites for facilities have been selected and defined.

### **1.3 Scope of the Project: Study Area, Regions, Communities and Governance**

From a socio-economic perspective, the study area includes all of the areas in which the direct or indirect effects of gas production and transportation might affect permanent residents. As the pipeline will essentially run parallel to the Mackenzie River to within 200 km of the Alberta boundary, all of the Northwest Territories communities along the river, or close to it, are included.

The study area is currently divided into four settlement areas in the Northwest Territories:

- Inuvialuit Settlement Region (ISR)
- Gwich'in Settlement Area (GSA)
- Sahtu Settlement Area (SSA)
- Deh Cho Region (DCR)

Also included are communities that, despite their more distant locations, might experience some direct or indirect economic and social effects from the project. Over half the communities included in the study area are in this category. The study area communities in the Northwest Territories that are more distant from project facilities include:

- Sachs Harbour
- Holman
- Paulatuk
- Fort McPherson
- Tsiigehtchic
- Colville Lake
- Déline
- Fort Liard
- Nahanni Butte
- Fort Providence
- Kakisa
- Trout Lake
- Hay River Reserve
- West Point Reserve

Despite their distance from the pipeline, Yellowknife and Hay River are also included in the study area because of project effects on government departments, and on northern transportation systems and business.

As well, the study area includes the NOVA Gas Transmission Ltd. (NGTL) Northwest Mainline (Dickins Lake Section) in northwestern Alberta, encompassing three communities of the Dene Tha' First Nation (DTFN), and the communities of High Level, Rainbow Lake and Zama City (see Figure 1-1).

Hay River is in the area now included in the land claims negotiations of the Deh Cho First Nations with the governments of Canada and the Northwest Territories. However, in the analyses in this volume, Hay River is not considered with the other DCR communities. Like Yellowknife, it is essentially an industrial and commercial centre, with a predominantly non-Aboriginal population. Accordingly, the effects of the project are analyzed separately for these two industrial and commercial centres.

The Inuvialuit, Gwich'in and Sahtu people have settled land claims in their areas, and the Deh Cho people have negotiated an interim agreement with the Government of Canada that effectively gives them direct input into land allocation in their area.

#### **1.4 Methods of Analysis of Socio-Economic Effects**

For a detailed discussion of the methods of analysis, see Volume 1, Section 2, Assessment Method.

Before analysis of project effects, the pre-project baseline conditions in the study area must be established. For example, what are the existing conditions in the communities of this area before any project effects are experienced?

The descriptions of the relevant economic and social conditions, based on an analysis of the most recent quantitative and qualitative data available for this area, are found in Volume 4, Socio-Economic Baseline. However, brief synopses of the most relevant indicators are included in this volume as context for each key assessment question.

Forecasting what changes the project will induce in these baseline conditions is both a science and an art, because in many cases a project effect is both adverse and positive. The effects of a project-induced substantial increase in income are an example. The extra income might be saved, invested or spent by individuals to improve their standard of living and family well-being, or might be spent on socially disruptive or destabilizing behaviour.

In addition to this element of individual choice, the overall importance of many potential effects depends on the attitudes and perceptions of affected communities, groups and individuals.

Volume 1, Section 3, Traditional Knowledge, and Section 4, Public Participation are also particularly relevant to the effects assessment presented here.

##### **1.4.1 Specific Effects, Combined Effects and Cumulative Effects**

Specific effects are the effects of a specific component of a project, e.g., a pipeline. Where there are two or more project components, i.e., activities associated with construction and operations of anchor gas fields and pipelines, along with the necessary logistics and infrastructure, each will have its own unique specific effects. Taken together, the effects of these components are considered the combined effects of this project. In fact, most socio-economic effects are, by nature, combined effects because causality is not often clear enough to determine which component or activity results in what effect.

In Section 2, Project Expenditures, the demand drivers for the assessment are presented by project component. This makes it easier to use this material to support the component development plan applications (DPAs). However, it

results in some duplication. Heritage resources, and nontraditional land and resource use, have also been assessed in this manner. The remainder of the analyses cannot be separated by component and are therefore assessed regionally.

Evaluating cumulative effects involves combining the specific or combined project socio-economic effects on people with those of other large-scale development and construction projects.

Construction and anchor field development is scheduled to begin in 2006. Current ongoing projects and developments on the project-inclusion list, for which labour demand data is available, will be completed before late 2006, except:

- the Devon project is expected to begin offshore drilling in 2005 or 2006
- the De Beers Snap Lake diamond mine will begin operations in 2007 (De Beers 2003)
- construction of the Deh Cho Bridge across the Mackenzie River at Fort Providence might begin during winter 2004 to 2005 (Bryshum 2003, personal communication)

As these projects are unlikely to generate direct socio-economic effects on study area communities, the main socio-economic cumulative effects issue relevant to this project is expected to be the demand on the northern labour force.

## 1.4.2 Key Questions and Effect Pathway Diagrams

### 1.4.2.1 Key Questions

Key questions were developed to address the issues identified through community and stakeholder participation in the scoping process, and to determine effects on the valued components (VCs) chosen for this assessment. These questions are noted at the beginning of each subject that addresses a key question, and then discussed in detail.

### 1.4.2.2 Effect Pathway Diagrams

Effect pathway diagrams were developed for each key question to illustrate the potential cause-effect relationships between the project and the VCs. For example, for the key question, *How will the project affect nontraditional land and resource use?*, the effect pathway diagram examines all the ways the project could affect nontraditional land and resource use, taking into account linkages with other discipline results.

### 1.4.3 Project Effect Attributes

The assessment of effects on most socio-economic components lacks specific guidelines and scientific thresholds as guidance. This is because of several factors, including the inability to quantitatively determine effects on VCs that are not easily defined by numbers. For example, it is difficult to predict a numerical change in recreational activities, or a change in perceived enjoyment. Therefore, qualitative methods were used to assess many social, nontraditional land and resource use, and heritage resource effects. Input from the public participation process, professional judgment and linkages with other disciplines were used to make effect predictions in these cases. More rigorous, quantitative approaches were used to assess certain demographic and economic effects.

Summary tables are used to illustrate the impact assessment results. In addition, linkages with the results of other disciplines are discussed where applicable.

The socio-economic effect attribute definitions in Table 1-2 apply to the sections on:

- the economy
- infrastructure and community services
- individual, family and community wellness
- traditional culture

The VCs in the sections on nontraditional land and resource use (see Section 7), and heritage resources (see Section 8), are aligned with the biophysical definitions, which are slightly different. This is discussed further in those two sections.

#### 1.4.3.1 Direction

*Direction* describes the ultimate long-term trend of the effect. There are three options for direction, including adverse, neutral and positive. For some VCs, such as traditional resource harvesting, project effects can be both positive and adverse, e.g., an increase in income could be spent to support new opportunities for hunters. However, project employment might decrease time available for hunting.

#### 1.4.3.2 Magnitude

*Magnitude* describes the severity or intensity of the effect. Typical measurements of magnitude indicate gains or losses in features, e.g., less accommodation available or higher demand on recreational resources, or changes in conditions, e.g., ability of policing services to keep up with demands for service. The terms no effect, low, moderate and high are used to describe magnitude. Some effects could have a range of magnitude because of subjective factors.



Table 1-2: General Definitions of Effect Attributes

Attribute	Definition
<b>Direction</b>	
Adverse	Effect is worsening or is not desirable
Neutral	Effect is not changing compared with baseline conditions and trends
Positive	Effect is improving or is desirable
<b>Magnitude</b>	
No effect	Effect does not occur
Low	Effect occurs that might or might not be detectable, but is within the normal range of variability
Moderate	Clearly an effect but unlikely to pose a serious risk to the VC or represent a management challenge
High	Effect is likely to pose a serious risk to the VC and represents a management challenge
<b>Geographic Extent</b>	
Local	Biophysical – effect is limited to the local study area Socio-economic – effect is limited to specific affected persons or communities
Regional	Biophysical – effect is limited to the regional study area Socio-economic – effect extends to several communities in the affected region
Beyond regional	Biophysical – effect extends beyond the regional study area Socio-economic – effect extends beyond one region to include communities in more than one region of the study area, or to include commercial or industrial centres in the Northwest Territories and northwestern Alberta
National	Biophysical – not applicable Socio-economic – effect on the VC extends nationally, or beyond the communities in the study area
<b>Duration</b>	
Short term	Biophysical – effect is limited to less than one year Socio-economic – effect is limited to construction
Medium term	Biophysical – effect occurs between one and four years Socio-economic – not applicable
Long term	Biophysical – effect lasts longer than four years, but does not extend more than 10 years after decommissioning and abandonment Socio-economic – effect extends throughout operations or beyond
Far future	Biophysical – effect extends more than 10 years after decommissioning and abandonment Socio-economic – not applicable
NOTES: Definitions in this table provide a framework for the description of project effects. Applications of definitions for specific topics are provided in sections for specific areas in the impact assessment volumes (this volume and Volume 5, Biophysical Impact Assessment).	

### 1.4.3.3 Geographic Extent

*Geographic extent* describes the measurement of area within which an effect occurs. Local geographic extent indicates that effects will be limited to one or more individual communities. Regional geographic extent is defined as effects that include all communities in a geopolitical region. Beyond regional extent relates to effects beyond a single region, to include more than one region of the study area, or commercial or industrial centres in the Northwest Territories and northwestern Alberta. National extent describes effects on a VC that extend nationally, or beyond the communities in the study area.

### 1.4.3.4 Duration

*Duration* refers to how long an effect occurs, or how long a VC needs to recover from an effect. Recovery is defined as a return to conditions that would exist if the project had not occurred. For socio-economic effects, it is not normally practical to be more precise than short term and long term. These are assumed to correspond with the project phases, i.e., construction = short term, and operations = long term. It is considered not practical to try to predict the socio-economic effects of decommissioning and abandonment. The duration of an effect within a phase can be continuous or intermittent.

## 1.4.4 Significance of Effects

In assessing the attributes of the projected socio-economic effects, the assessment team combined inputs from the following:

- quantitative analyses, such as supply and demand matching, and economic modelling
- informed source opinions obtained by interviews with officials, and public service providers and practitioners
- advice and input from potentially affected groups and individuals through the EIS public participation program (see Volume 1, Section 4, Public Participation) that included community sessions, and regional and nongovernment organization workshops
- professional judgment based on the training and experience of the analysts

Socio-economic issues have particularly complex cause–effect linkages, and are inherently personal and subjective. Therefore, the attitudes of affected persons, interest groups and the public are very important. These attitudes are also very dynamic, and therefore any assessment has a real but variable temporal limitation. The result is a substantial amount of uncertainty for the users of this assessment and a challenge for the regulatory process.

Recognizing these conditions, the assessment team focused its determination of the significance of socio-economic effects on three key attributes:

- magnitude
- geographic extent
- duration

It is important to emphasize that socio-economic effects can be either positive or adverse in direction, and sometimes both. If the effect is both positive and negative, the *net* effect is estimated and the predominant direction stated.

Significance is usually shown in tabular form as the result of a combination of these attributes, summarized in Table 1-3.

**Table 1-3: Significance of Project Effect Attributes**

Magnitude	Geographic Extent	Duration	Significant
High	Regional or beyond regional	Short term	Yes
High	Local	Long term	Yes
Moderate or high	Beyond regional or national	Long term	Yes

All other combinations of effect attributes were judged to be not significant.

## 1.5 Identifying Project Effects on Residents of Northwestern Alberta

The proposed gas pipeline crosses the boundary into northwestern Alberta, where it ties into the NOVA Gas Transmission Ltd. (NGTL) interconnect facility. The NGTL Northwest Mainline (Dickins Lake Section) is planned to extend to this tie-in point from about 65 km south of the Alberta–Northwest Territories boundary.

For the purpose of this assessment, implementing the mitigation plans and techniques in this volume and in Volume 7, Environmental Management, have been assumed when evaluating residual effects of the NGTL interconnect facility and the NGTL Northwest Mainline (Dickins Lake Section). Specific environmental management plans will be prepared by NGTL for its facilities, based on the requirements of applicable regulatory agencies.

Currently, predictions of the effects of the project on northwestern Alberta residents are constrained because the requisite information is incomplete or lacking. Projecting the effects of development depends first on having a reasonably complete and accurate description of baseline conditions in the region or communities that might benefit or suffer from the effects of project activity. The available information on northwestern Alberta (see Volume 4, Socio-Economic Baseline) is incomplete because the DTFN decided to limit its participation to providing certain statistics and administrative data, pending a broader project agreement with the project proponents. Thus, necessary public and key informant participation in the EIS was not possible. This limits the socio-economic impact assessment (SEIA) findings.

Given the broad similarities between the situations of the people in northwestern Alberta and some of the Deh Cho communities in the Northwest Territories, broad generalizations about expected project residual effects can be made. These generalizations are based on:

- what is now known about the people in the affected communities
- ways in which the pipeline and associated facilities will probably be built
- the health and social services available in northwestern Alberta

These are included in the various relevant key question discussions.

Adequate data was obtained in the predominantly non-Aboriginal service centres of High Level, Rainbow Lake and Zama City. The assessed effects apply only to construction. Most employment numbers and opportunities generated by the project will end once design and construction, and associated cleanup and site reclamation activities, are complete. Few people in this region are likely to obtain project employment during operations. The operations of NGTL facilities will be integrated in existing NGTL programs in the region. Accordingly, there will be no significant socio-economic effects induced by project operations in northwestern Alberta.

## 1.6 Management of Socio-Economic Effects

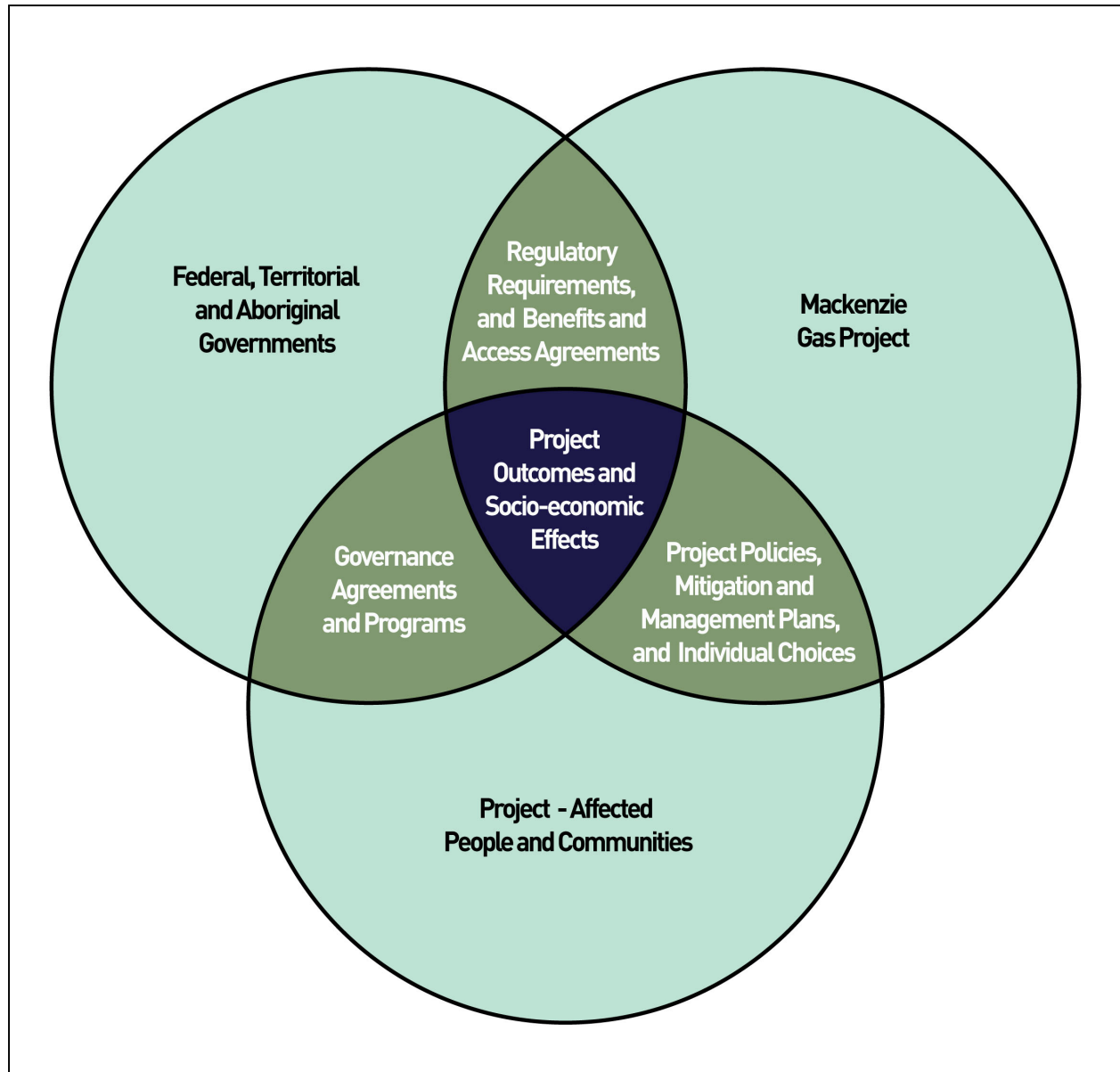
Because of the complex and dynamic nature of socio-economic effects, the challenge continues beyond assessment to mitigation, or perhaps more appropriately, management, measures. The analysis in this volume assumes both an existing best practice management framework, and proposed new or enhanced mitigation measures. These are integrated with various project policies and programs relating to human environment issues and effects, such as:

- benefits plans
- benefits and access agreements
- the proposed agreements between the project proponents and the Government of the Northwest Territories (GNWT)

Because of the nature, scope and magnitude of many expected project-related socio-economic effects, the management plans and programs addressing these effects will require a coordinated and collaborative response from:

- the project
- Aboriginal, territorial and federal government agencies
- affected communities and individuals

Most socio-economic effects are expressed as marginal changes in levels of existing conditions that involve many issues directly influenced by individual, community and government decisions related to public service delivery. Therefore, these socio-economic effects cannot be managed by project proponent decisions alone (see Figure 1-2).



**Figure 1-2: Shared Responsibility for Socio-Economic Effects Management**

Shared responsibility for management of socio-economic effects was a key theme of the second nongovernment organization (NGO) workshop held March 22 to 24, 2004. Participants from northern communities expressed the need for corridor communities, in particular, to work with the project proponents and territorial

government agencies to monitor and improve local quality of life. This recognition of the need for communities to take more responsibility for developing and guiding quality of life was also registered by attendees at the Tsiigehtchic open house on January 21, 2004 and the Sahtu confirmation meeting held May 11 to 12, 2004.

Even if all parties can agree on a suitable management action and a desirable outcome, it is difficult to achieve clear and coordinated implementation results because:

- the causes of the effects are often too complex as a result of many other contributing influences
- desirable outcomes involve too many inter-related or interdependent variables, i.e., individual behaviour decisions, family support, political leadership, public policy and service delivery agency response

For each subject area, mitigation measures are presented that reflect the complex and inter-related causes of effects and the requirement for shared responsibility. The mitigation measures show the interfaces among parties where choices and decisions can be made to:

- share responsibility
- show the need for cooperative management among regulators, communities and affected people
- identify specific actions that could be taken

These discussions also include commitments by the project proponents to take certain management actions as their contribution to this shared responsibility. Although the assessment includes the NGTL expansion facilities in northwestern Alberta, the effects management commitments do not include NGTL.

