



CANADIAN ASSOCIATION
OF PETROLEUM PRODUCERS

GUIDE

Environmental Operating Practices for the Upstream Petroleum Industry

British Columbia - Overview and Resources

December 2001

2002-0016

The Canadian Association of Petroleum Producers (CAPP) represents 140 companies that explore for, develop and produce natural gas, natural gas liquids, crude oil, oil sands, and elemental sulphur throughout Canada. CAPP member companies produce over 97 per cent of Canada's natural gas and crude oil. CAPP also has 125 associate members that provide a wide range of services that support the upstream crude oil and natural gas industry. Together, these members and associate members are an important part of a \$60-billion-a-year national industry that affects the livelihoods of more than half a million Canadians.

Review by July 2004

Disclaimer

This publication was prepared for the Canadian Association of Petroleum Producers (CAPP) by Tamarack Solutions Inc. While it is believed that the information contained herein is reliable under the conditions and subject to the limitations set out, CAPP and Tamarack Solutions Inc. do not guarantee its accuracy. The use of this report or any information contained will be at the user's sole risk, regardless of any fault or negligence of Tamarack Solutions Inc., CAPP or its co-funders.

2100, 350 – 7th Ave. S.W.
Calgary, Alberta
Canada T2P 3N9
Tel (403) 267-1100
Fax (403) 261-4622

230, 1801 Hollis Street
Halifax, Nova Scotia
Canada B3J 3N4
Tel (902) 420-9084
Fax (902) 491-2980

905, 235 Water Street
St. John's, Newfoundland
Canada A1C 1B6
Tel (709) 724-4200
Fax (709) 724-4225

Email: communication@capp.ca Website: www.capp.ca

Overview

This is the *Overview and Resources* volume of the *Environmental Operating Practices for the Upstream Petroleum Industry—British Columbia Operations*. The five-volume guide provides members with a comprehensive resource and management tool that can help you quickly determine which regulatory requirements and environmental issues affect your operations. It also provides recommended industry practices and resources for meeting those requirements.¹ The *Environmental Operating Practices* are key guidance documents for CAPP's Environment, Health and Safety Stewardship Program.

¹ References are listed by current agency and organization names. In most cases, companies should refer to the latest editions of references.

Contents

1	Roadmap.....	1-1
1.1	Roadmap to the Environmental Operating Practices.....	1-1
1.1.1	Knowing Where You Are.....	1-1
1.1.2	Knowing What to Look For.....	1-1
1.1.3	Finding What You Need.....	1-2
2	Introduction.....	2-1
2.1	About the Author and the Documents.....	2-1
2.1.1	What is CAPP?.....	2-1
2.1.2	Why Were These Practices Developed?.....	2-1
2.1.3	What Are These Environmental Operating Practices?.....	2-2
2.1.4	How Were They Developed?.....	2-2
2.1.5	Who Were They Developed For?.....	2-3
2.2	About Your Environmental Liabilities.....	2-3
2.2.1	What Are Your Environmental Liabilities?.....	2-4
2.2.2	What Is Due Diligence?.....	2-4
3	Environmental Management Systems and Tools.....	3-1
3.1	Overview of Environmental Management Systems.....	3-1
3.1.1	Definition.....	3-1
3.1.2	The Essential Elements.....	3-1
3.1.3	Additional Elements.....	3-5
3.2	CAPP's Basic Environmental Program.....	3-5
3.2.1	Introduction.....	3-5
3.2.2	The Elements of the Basic Environmental Program.....	3-5
3.2.3	References.....	3-8
3.3	Environmental Audits.....	3-9
3.3.1	Objectives.....	3-9
3.3.2	Management Philosophies for Conducting Environmental Audits.....	3-9
3.3.3	Components of Environmental Auditing.....	3-10
3.3.4	Auditing Criteria.....	3-11
3.3.5	Types of Environmental Audits.....	3-11
3.3.6	Benefits of Audits.....	3-12
3.3.7	Audit Activities.....	3-12
3.3.8	Importance of Audit Consistency.....	3-15
3.3.9	Audit Continuity and Regulatory Actions.....	3-15
3.3.10	References.....	3-15
3.4	Environmental Impact Assessments.....	3-16
3.4.1	Environmental Assessment Act.....	3-16
3.4.2	Waste Management Act.....	3-22
3.4.3	Environment Management Act.....	3-22
3.4.4	References.....	3-23

3.5	Cumulative Effects Assessments	3-23
3.5.1	Introduction.....	3-24
3.5.2	When Cumulative Effects Assessments Are Required.....	3-24
3.5.3	References.....	3-24
3.6	Environmental Monitoring	3-25
3.6.1	Introduction.....	3-25
3.6.2	Monitoring Requirements	3-26
3.6.3	Environmental Monitoring Program Components.....	3-26
3.6.4	Operational Issues.....	3-26
3.6.5	References.....	3-27
3.7	Risk Assessments and Risk Management.....	3-27
3.7.1	Introduction.....	3-27
3.7.2	Information Requirements	3-30
3.7.3	Regulatory Process	3-31
3.7.4	Risk Assessment Approaches	3-33
3.7.5	References.....	3-33
4	Regulatory Processes	4-1
4.1	Key British Columbia Regulatory Agencies.....	4-1
4.1.1	Introduction.....	4-2
4.1.2	Oil and Gas Commission	4-2
4.1.3	Ministry of Energy and Mines	4-6
4.1.4	Ministry of Water, Land and Air Protection.....	4-6
4.1.5	Ministry of Sustainable Resource Management	4-6
4.1.6	Other Ministries	4-9
4.1.7	Regional Districts and Municipalities.....	4-9
4.2	Key Federal Regulatory Agencies	4-10
4.2.1	Introduction.....	4-10
4.2.2	Canadian Environmental Assessment Agency	4-10
4.2.3	Department of Fisheries and Oceans	4-10
4.2.4	Environment Canada.....	4-11
4.2.5	Human Resources Development Canada.....	4-12
4.2.6	Indian Oil and Gas Canada	4-13
4.2.7	National Energy Board	4-13
4.2.8	Natural Resources Canada	4-13
4.2.9	Transport Canada.....	4-14
4.2.10	References.....	4-14
4.3	Interjurisdictional Regulatory Issues	4-14
4.3.1	Introduction.....	4-14
4.3.2	Where Activities Cross Jurisdictional Boundaries	4-14
4.4	Environmental Approvals and Applications.....	4-15
4.4.1	Introduction.....	4-15
4.4.2	Summary of Approvals Processes by Industry Activity.....	4-16
4.4.3	References.....	4-20
4.5	Enforcement.....	4-20

4.5.1	Introduction.....	4-20
4.5.2	Oil and Gas Commission	4-20
4.5.3	Ministry of Forests.....	4-23
4.5.4	Ministry of Water, Land and Air Protection.....	4-24
4.6	Government Initiatives for Environmentally Significant Issues.....	4-24
4.6.1	Introduction.....	4-24
4.6.2	Land Use Planning.....	4-24
4.6.3	Forest Practices Code.....	4-28
4.6.4	Climate Change.....	4-29
4.6.5	Coalbed Methane	4-31
4.6.6	References.....	4-32

Appendix A Definitions

Appendix B Abbreviations and Acronyms

Figures

Figure 3-1: Environmental Assessment Review Process	3-19
Figure 3-2: Receptors and Exposure Pathways for Risk Assessment.....	3-30
Figure 3-3: Cleanup Process Using Risk-based Remediation Standards.....	3-32

Tables

Table 4-1: Activity Approvals Issued by the Commission.....	4-5
Table 4-2: Summary for Certificates, Leave and Permission Under the Pipeline Act	4-18

1 Roadmap

1.1 Roadmap to the Environmental Operating Practices

see also . . .

+ Table of Contents

1.1.1 Knowing Where You Are

This is the *Overview and Resources* volume of the *Environmental Operating Practices for the Upstream Petroleum Industry—British Columbia Operations*, developed by the Canadian Association of Petroleum Producers (CAPP).

This volume describes why and how the *Environmental Operating Practices* were developed, and provides a summary of management systems and regulatory processes applicable to environmental liabilities of oil and gas operations in British Columbia (the Province).

There are four other volumes in this series including:

- *Geophysics*—identifies environmental issues and operating practices related to seismic activities.
- *Drilling*—describes environmental issues and operating practices related to drilling, completions and workovers.
- *Production*—identifies environmental issues and operating practices related to the design, construction, operation or abandonment of an oil and gas production facility.
- *Pipelines*—defines environmental issues and operating practices related to the construction and operation of any type of pipeline.

Based on CAPP's 1993 *Environmental Operating Guidelines for the British Columbia Upstream Petroleum Industry* and the *British Columbia Oil and Gas Handbook*, these new volumes have been updated to reflect current technologies, legislation and industry practices. Each volume is designed to offer useful guidance to individuals who are responsible for developing environmental strategies within their organizations as well as for those who carry out the day-to-day operational activities and are responsible for ensuring that environmental requirements are met.

1.1.2 Knowing What to Look For

Within this *Overview and Resources* volume, you will find the following:

- Table of Contents - lists all the sections and topics covered in this volume
- Introduction - provides a brief biography of CAPP and its work in creating these new *Environmental Operating Practices*, and a description of the specific environmental liabilities associated with upstream petroleum industry activities

- Environmental Management Systems - offers an overview of several management systems and tools available to the industry (including CAPP's *Guide to Developing a Basic Environmental Program for the Upstream Petroleum Industry*), environmental audits and impact assessments, cumulative effects assessments, and environmental monitoring and risk assessments
- Regulatory Process - summarizes how the federal and British Columbia governments regulate industry activities that have the potential of impacting the environment
- Definitions - lists common terms used in this volume and offers accepted definitions
- Abbreviations and Acronyms – offers a list of abbreviations and acronyms used throughout the publication

Each of the above sections is broken into several topics. Included with each topic is a “see also” list that directs you to related topics in this volume and other volumes.

1.1.3 Finding What You Need

Your many reasons for using these *Environmental Operating Practices* will vary throughout your environmental work. To obtain information quickly and efficiently from each volume, you should first familiarize yourself with the Table of Contents, and the organization and types of information provided within individual sections and topics.

To find specific topics or address specific environmental questions:

- 1) Look first to the Table of Contents. Skim through the section and topic titles to see if any of them match what you are looking for.
- 2) Turn to the section and topic that most closely match what you are looking for, review it and check the related topics identified in the “see also” list.
- 3) Use search tools to find information related to specific items.
- 4) If you need more detail than is provided in this volume on regulatory requirements, technical data, or step-by-step guidelines, obtain the recommended reference documents listed at the end of each section or visit the applicable agency website.

2 Introduction

2.1 About the Author and the Documents

see also . . .

+ Section 1.1, Roadmap to the Environmental Operating Practices

2.1.1 What is CAPP?

The Canadian Association of Petroleum Producers (CAPP) represents 140 companies that explore for, develop and produce natural gas, natural gas liquids, crude oil, oil sands, and elemental sulphur throughout Canada. CAPP member companies produce over 97 per cent of Canada's natural gas and crude oil. CAPP also has 125 associate members that provide a wide range of services that support the upstream crude oil and natural gas industry. Together, these members and associate members are an important part of a \$60-billion-a-year national industry that affects the livelihoods of more than half a million Canadians.

CAPP's mission is to enhance the economic well being and sustainability of the Canadian upstream petroleum industry in a socially, environmentally and technically responsible manner.

2.1.2 Why Were These Practices Developed?

CAPP developed the *Environmental Operating Practices for the Upstream Petroleum Industry—British Columbia Operations* to help Canadian petroleum exploration and production companies develop and implement environmental programs that effectively meet regulatory requirements, improve environmental performance and demonstrate due diligence.

Canadian upstream petroleum companies need effective environmental programs to:

- help all functional areas within their organizations understand and comply with environmental legislation;
- minimize the costs and liabilities associated with environmental damage (*e.g.*, fines, legal fees, spill cleanup and land reclamation);
- assure bankers, insurance companies, investors, partners and other business support groups that environmental matters are being properly managed;
- provide for a due-diligence defense in the event of an environmental incident;
- encourage employees to take pride in their work; and,
- support good relations with landowners and other members of the public.

The underlying value of any environmental program must be to minimize the impact of exploration and production operations on the natural and human environment.

2.1.3 What Are These Environmental Operating Practices?

The five volumes of the *Environmental Operating Practices for the Upstream Petroleum Industry—British Columbia Operations* suggest practices to help you develop and implement an environmental program for your company. As you work through them to build your program, you'll also find that the *Environmental Operating Practices* offer specific advice on how to undertake oil and gas activities in a manner acceptable to government, industry and the communities you work in.

The practices are divided into five volumes, including this one, to address specific types of operations separately. The volumes are described in the “Roadmap” section (*Section 1*) and include:

- *Overview and Resources*
- *Geophysics*
- *Drilling*
- *Production*
- *Pipelines*

The various volumes are intended to serve as do-it-yourself guides to help you first determine which specific environmental impacts you need to address and then how to address them. The individual practices provided in each volume focus on developing and implementing environmentally sustainable practices at a field level. The guidance they offer is descriptive, not prescriptive, and primarily addresses legislated requirements. All of the information they offer requires interpretation in the context of your organization's business activities and environmental needs. If your operations are outside British Columbia, you will also need to review comparable legislation and industry documents from the provinces in which you operate.

The volumes of the *Environmental Operating Practices* are NOT intended to be textbooks or procedure manuals that can be read and adopted in their entirety. Responsibility for ensuring compliance with environmental legislation lies with every individual in your company. To meet this challenge, you and everyone who works with you in developing and implementing your environmental program, must be firm in your commitment and steady in your efforts toward improving environmental performance, exercising due diligence and ensuring regulatory compliance.

2.1.4 How Were They Developed?

The predecessor to these practices was CAPP's 1993 *Environmental Operating Guidelines for the British Columbia Upstream Petroleum Industry*. These guidelines, along with the *British Columbia Oil and Gas Handbook* and the 1999 editions of the *Environmental Operating Practices for the Petroleum Industry—Alberta Operations*, were used as base material for the new practices. From there, Tamarack Solutions Inc., hired by CAPP, incorporated current regulatory

requirements and then looked to industry to determine its current practices. New technologies and management approaches were added and the document was divided into five volumes to better target an individual user's needs. The presentation of the information was also redesigned to help readers quickly find and understand the information they need.

The completed volumes were reviewed by industry members and regulatory agencies at the draft stage to test accuracy, completeness and validity, and also to determine if the level of performance targeted by the practices was consistent with industry's values.

The CAPP team responsible for directing and reviewing the work included:

- Alan Kennedy, Imperial Oil Resources Limited;
- Dave Lye, AEC Oil and Gas; and,
- Terry Forkheim, Anadarko Canada.

Alan Kennedy provided review comments on content and editorial assistance.

2.1.5 Who Were They Developed For?

The *Environmental Operating Practices* are primarily for exploration, production and transmission companies. They will also be useful to other members of the upstream petroleum industry including:

- oilfield service and supply companies;
- oil and gas contractors and consultants;
- regulatory agencies;
- engineering and technical educational institutions; and,
- petroleum industry associations.

Many large upstream operators have already developed extensive environmental practices and will recognize many of the practices within these volumes; however, large operators often hire or conduct joint ventures with smaller companies that may not have complete environmental practices in place. Larger operators can use the *Environmental Operating Practices* as a baseline against which they can measure or make recommendations about the environmental practices of their suppliers, contractors and smaller partners.

Small and medium-sized companies will find that the *Environmental Operating Practices* capture the essential elements of effective environmental performance and can be used to quickly develop and implement environmentally sustainable operating practices.

2.2 About Your Environmental Liabilities

see also . . .

+ Section 4, Regulatory Processes

2.2.1 What Are Your Environmental Liabilities?

Environmental liabilities will vary depending on your operations, but they will generally include:

- protecting air, water, soil and wildlife during all phases of exploration, construction, operations and abandonment;
- protecting long-term land use capabilities;
- preventing access to protected areas;
- reclaiming disturbed sites;
- meeting regulatory requirements; and,
- addressing public concerns.

The more effectively you manage these liabilities, the less your company will have to spend on fines, environmental rehabilitation, legal disputes and public relations.

2.2.2 What Is Due Diligence?

Due diligence, an accepted measure of how well industry manages its environmental liabilities, is defined² as “the actions that a reasonably prudent person would be expected to take to demonstrate that all reasonable care had been exercised to prevent an incident or offense.” The test of what constitutes reasonable care or due diligence depends on the facts and circumstances of each individual case.

Due diligence is further defined by:

- Policy - a formal environmental policy or code of practice developed by a senior executive and endorsed by the president;
- Commitment - demonstration of the concern of company officers and directors for the environmental performance of the company through:
 - environmental performance reports;
 - adequate follow-up of all incidents; and,
 - assignment of adequate resources to environmental programming;
- Communication - the passing of information regarding the environmental policy and individual environmental responsibilities to all management and staff;
- Audits and Inspections - a formal program for environmental audits and inspections to promote compliance with environmental regulations, company policy and industry best practices; and,
- Reporting - regular reports to company officers and directors regarding environmental incidents and performance.

² By the *Alberta Environmental Protection and Enhancement Act*.

These *Environmental Operating Practices* are a component of due diligence, offering you targeted guidance on how to manage specific environmental liabilities in your operations.

3 Environmental Management Systems and Tools

In addition to specific operating practices that need to be implemented in the field, companies should have an overall environmental management system to tie together corporate goals and field performance. This section describes a variety of accepted systems and tools that can help your company organize, manage and monitor all aspects of environmental performance and liability.

3.1 Overview of Environmental Management Systems

also . . .

+ Section 3.2, CAPP's Basic Environmental Program

+ Section 2.2, About Your Environmental Liabilities Introduction

Environmental management systems can best be described as management systems that have essential management and related administration elements. These essential elements are the components required for the creation, implementation and effective operation of an environmental management system within any organization.

3.1.1 Definition

An environmental management system is a component of an organization's overall management system, and provides the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources necessary for the development, implementation, review, maintenance and continual improvement of the organization's environmental policy.

For an environmental management system to be effective, it should be more than an information management system. It should be completely integrated into the organization's existing management framework, making environmental management a practical component of day-to-day activities and long-term operations.

3.1.2 The Essential Elements

The essential elements of an environmental management system are as follows.

Corporate Support, Leadership and Management Commitment

Corporate support, from senior management to frontline employees, is essential to the effective implementation and operation of an environmental management system. The institution of an environmental management system should begin with the definition of the organization's environmental policy by senior management.

This policy should:

- be appropriate to the nature, scale and potential impacts of the organization's business activities;
- include a commitment to continually improve the environmental management system and the organization's environmental stewardship;
- include a commitment to comply with all legislation relevant to the organization's activities, as well as all requirements of industry groups to which the organization belongs, and any internal standards the organization sets;
- have a framework for setting and reviewing environmental objectives and targets;
- be documented, implemented and maintained;
- be communicated to all directors, employees and contractors of the organization. Responsibilities for upholding the policy should be clearly defined for each of these parties; and,
- be available to shareholders, regulators and the public.

From a due diligence standpoint, it is the responsibility of senior management to ensure that once the environmental policy has been developed it meets all the above requirements.

Effective and Practical Day-to-Day Management Systems

Without an effective and practical day-to-day management system, it is impossible for an environmental management system to operate in real time. The effectiveness of a day-to-day management system is based on both the type and level of information gathered and transmitted by the management system.

The practicality of the management system is based on the success of the company in getting personnel to undertake environmental responsibilities as a part of their day-to-day job activities. Practicality is necessary to ensure business operations are not hampered by the management system and to make sure the system is used.

Integrated Policies, Procedures and Decision-Making

The key to successful environmental protection lies in the level of complexity surrounding policies, procedures and decision-making. To best manage your company's environmental liabilities you need to keep your policies, procedures and decision-making processes simple and integrated. They should be easy to access, easy to understand and fully integrated with the main management system to address environmental, safety and technical requirements at the same time.

In keeping them simple, you should also consider how they will impact your company's activities and be impacted by these activities (*i.e.*, type and number of activities) and the organizational infrastructure (*i.e.*, associated personnel responsibilities). Too often successful development and implementation of

environmental policies and procedures is hampered by numerous and wide-ranging company activities and the related web of personnel responsibilities and duties those activities create.

Strong Communications and Information Recording

Information flow and availability are critical to the success of an environmental management system. The availability of information should be as follows:

- All directors, employees and other agents of the organization should be made aware of the organization's environmental policy and have their roles within the environmental management system defined.
- Current (real-time) environmental information should be readily available to those who require it.
- Contact persons should be designated and available to provide information on environmental requirements and performance as needed.
- A practical and efficient method of recording and retrieving information should be implemented, used and kept current.
- Mechanisms should be put into place to identify system deficiencies and communicate them to the appropriate individuals.
- Information reports should be prepared regularly to allow managers with designated environmental responsibilities to assess the current environmental status of the organization and judge the success of past initiatives.

With the rapidly evolving computer and communications technologies, computerized databases that are accessible on a network offer the best option for recording and managing environmental information. With increasing on-line capabilities, a centralized database can be accessed and updated by organization members from any location, thereby keeping the environmental management system information functioning in real time.

Compliance Monitoring and Risk Management

An ongoing system should be in place to monitor regulatory compliance requirements and reporting schedules. It should also regularly monitor both the types and levels of environmental risk based on non-compliance situations. A full risk management program should be considered as a tool for monitoring high-risk activities and operations.

Effective and Continual Reporting

Regular reporting (and if required, extraordinary reporting) conveys the organization's current environmental status. These reports are of use in negotiations and communications with many groups, including management teams, creditors and financiers, insurance agents, regulatory agencies, shareholders and the public.

To be effective, these reports should include:

- all environmental activities (routine or extraordinary) undertaken since the last reporting period;
- all outstanding environmental deficiencies and corresponding mitigating actions;
- all environmental deficiencies retired since the last reporting process;
- steps undertaken to ensure continuous improvement, as well as a list of deficiencies or improvements noted or made since the last reporting period; and,
- projected environmental activities that are to occur within the next business period.

Performance Monitoring, Measurement and Recording Systems

To effectively measure an environmental management system, you need to assess job activities and related reports about the environmental impacts of those activities. The performance of personnel conducting those activities may also be measured through these reports. The effectiveness of such reporting programs depends on a good record keeping system for compliance permits, pollution control, waste management, and incidence accountability.

Environmental Awareness and Training

Awareness of environmental issues associated with specific operations, along with formal and practical training to ensure competent performance of assigned duties, are essential. Environmental operating procedures and policies must be understood for effective implementation to occur. Training provides an awareness of the issues and an understanding of environmental responsibility in general. Emphasis should be placed on the importance of each individual's environmental performance.

Training should be conducted on the appropriate environmental issues according to job responsibility. In general, managers who are responsible for preparing plans should be trained in environmental legislation and how it affects company liability. Operating personnel should be trained in procedures for specific tasks for which they are responsible.

Operations training should provide information on applicable day-to-day management issues such as:

- vegetation management;
- soil management;
- awareness of sensitive wildlife issues (*e.g.*, activity restrictions);
- environmental improvement systems;
- environmental risk management;
- clearing and timber management;
- pre-site baseline assessments and tracking of reports;
- waste management system and tracking of waste disposal;

- reclamation of leases/rights-of-way and tracking releases; and,
- incident and spill management.

3.1.3 Additional Elements

Many companies expand their environmental management systems to include:

- emergency response capability;
- incident investigation;
- stakeholder involvement;
- operational controls and procedures; and,
- environmental recognition programs.

These elements are included in CAPP's *Basic Environmental Program*, which is discussed on the following pages.

3.2 CAPP's Basic Environmental Program

see also . . .

+ Section 2.2, About Your Environmental Liabilities

+Section 4.5, Enforcement

3.2.1 Introduction

In February 1996, the *Guide to Developing a Basic Environmental Program for the Upstream Petroleum Industry* was released by CAPP to help industry develop effective and economical environmental management systems. In the same way that the International Standards Organization and the Canadian Standards Association target environmental performance through the ISO 14000 series of environmental management standards, CAPP has mapped out an environmental management system customized to the upstream petroleum industry.

3.2.2 The Elements of the Basic Environmental Program

As a companion to CAPP's *Environmental Operating Practices*, the *Basic Environmental Program* highlights all the key elements of effective environmental management, including:

- Element 1—Management and Leadership
- Element 2—Environmental Protection
- Element 3—Regulatory Compliance
- Element 4—Emergency Response
- Element 5—Employee Training and Awareness
- Element 6—Stakeholder Involvement and Reporting

These elements have been selected to reflect the needs of the upstream petroleum industry. They capture the scope of the environmental management system models described in the ISO 14000 series of environmental management

standards. The *Basic Environmental Program* emphasizes the types of environmental risks faced by the upstream petroleum industry.

Each of the elements is described briefly below.

Element 1—Management and Leadership

Management should demonstrate active and visible leadership of the environmental program. Officers and directors are liable for the environmental affairs of a company and they should take proactive steps to ensure environmental matters are being managed properly. To achieve this, the *Basic Environmental Program* offers:

- Environmental Policy Statement
- Corporate Environment Committee
- Responsibilities and Accountability
- Contractor Management
- Performance Recognition

Element 2—Environmental Protection

The second Element of the *Basic Environmental Program* is Environmental Protection. Under this Element are environmental management components that relate to exploration and production operations.

The 17 components in this Element reflect aspects of oil and gas exploration or production operations that have potential impacts to the natural environment. The components are:

- site selection;
- lease preparation;
- dike requirements;
- drilling waste management;
- general housekeeping;
- vegetation management;
- surface water and groundwater protection;
- protection of archaeological sites;
- noise control;
- atmospheric emissions;
- greenhouse gases;
- spill site reclamation;
- wellsite reclamation;
- management of earthen pits;
- waste management;
- storage; and,
- disposal wells.

Element 3—Regulatory Compliance

The third Element in the *Basic Environmental Program* is Regulatory Compliance. It is the responsibility of the operator to understand and comply with all appropriate environmental legislation.

The *Basic Environmental Program* proposes three components to encourage regulatory compliance, including:

- Environmental Monitoring;
- Inspections and Audits; and,
- Government Inspections.

In British Columbia, the Commission is developing a new compliance and enforcement regulatory delivery model that will require industry to be more self-reliant and accountable for regulatory compliance. It will allow the Commission to respond to escalating levels of activity and focus on the following inspection priorities:

- public safety, including public complaints that are health or safety related;
- environmental protection;
- community relations/other public complaints; and,
- operator rights/responsibilities.

(For details on the proposed model, refer to the Commission’s discussion paper “Compliance and Enforcement Regulatory Delivery,” February 28, 2000, the “Summary of Recommendations—Compliance and Enforcement Discussion Paper,” January 2001, and other materials posted on the Commission’s website at <http://www.ogc.gov.bc.ca/complianceand enforcement.asp>.)

Element 4—Emergency Response

The fourth Element of the *Basic Environmental Program* is Emergency Response. Some of the components in this Element are prompted by regulatory requirements. Others are based on the experience of prudent operators. The four components proposed to improve your company’s emergency response capabilities include:

- Corporate Emergency Response Plan;
- Facility Emergency Response Plan;
- Spill Prevention and Response; and,
- Incident Notification and Reporting.

Element 5—Employee Training and Awareness

Employee Training and Awareness is the fifth Element of the *Basic Environmental Program*. It is intended to capture two initiatives:

- 1) If employees are expected to perform their work in accordance with the company's environmental expectations, they should receive the appropriate training.
- 2) Through awareness and understanding of their company's environmental program, all employees should feel they are working for a company with high ethical standards and environmental performance.

To support these initiatives, the fifth Element contains:

- Training Requirements;
- Oil Spill Cooperatives; and,
- Employee Awareness.

Element 6—Stakeholder Involvement and Reporting

No business can operate in a vacuum. Most businesses have relationships with external stakeholders, some of whom may have an interest in the environmental affairs of the company. Some of these stakeholders can include:

- shareholders;
- partners;
- financial institutions;
- insurance companies;
- regulatory agencies;
- surrounding residents;
- industry associations;
- customers; and,
- the public.

Element 6 of the *Basic Environmental Program* has three components that focus on improving the corporate image and that of the industry in general. The components are:

- Community Relations;
- Environmental Reporting; and,
- Complaint Response.

The emphasis placed on these issues varies from company to company, depending on the corporate culture.

3.2.3 References

Canadian Association of Petroleum Producers, February 1996. *Guide to Developing a Basic Environmental Program for the Upstream Petroleum Industry*. Pub. No.1996-0002.

This document contains a compilation of regulatory requirements and industry practices that define expectations for environmental performance in the upstream petroleum industry. The program can be used to create or improve your company's environmental programming and to assess the

environmental programming of suppliers, contractors and joint venture partners.

3.3 Environmental Audits

see also . . .

+ Section 3.4, Environmental Impact Assessments

+ Section 3.5, Cumulative Effects Assessments

Environmental auditing can be defined as:

“A systematic process of objectively obtaining and evaluating evidence regarding a verifiable assertion about an environmental matter, to ascertain the degree of correspondence between the assertion and established criteria, and then communicating the results to the client. A verifiable assertion is a declaration or statement about a specific subject matter which is supported by documented factual data.”

3.3.1 Objectives

The principal objectives of auditing are to ensure:

- compliance with legal requirements and internal policies and standards; and,
- examination of performance to ensure compliance during operational phases of industry activity through:
 - management;
 - operations; and,
 - quality assurance.

Other objectives include the:

- evaluation of environmental management practices and facilities;
- identification and assessment of risks and liabilities; and,
- identification of the release or threat of release of any hazardous substance.

3.3.2 Management Philosophies for Conducting Environmental Audits

The environmental audit can be described as a key component for good business planning. It can also be referred to as a potentially strong management tool and as due diligence in action. The most important factors within an audit program are practicality and accessibility. Practicality ensures the audit is workable and will provide useable results. Accessibility ensures management will be able to easily understand the process and interpret the results.

Growing public and political recognition of the need to increase environmental protection and enforcement has emphasized the need for industry to exercise due

diligence. Environmental auditing has been developed as a mechanism to evaluate how companies are addressing and responding to environmental concerns.

Company philosophies for conducting environmental audits include:

- problem-solving to prevent negative environmental impacts;
- managing to ensure compliance with legislative requirements; and,
- managing for environmental stewardship.

3.3.3 Components of Environmental Auditing

Assessment and verification are the two primary components of environmental auditing. The purpose of these components and their associated audit activities are presented below.

Assessment

In environmental auditing, assessment provides judgment and opinion on environmental hazards, associated risks, and management and control hazards.

Assessment activities include:

- identification of known hazards and the estimation of the significance of risks;
- assessment of current practices and capabilities; and,
- development of recommendations to improve a company's approach to environmental management.

Verification

In environmental auditing, verification:

- evaluates the application of, and adherence to, environmental policies and procedures;
- certifies the validity of environmental data and reports; and,
- evaluates the effectiveness of management systems.

Verification activities include:

- verification that legislation and policies are being adhered to;
- identification of gaps in policies and standards; and,
- confirmation that management control systems are in place.

Combining Assessment and Verification

The most difficult task of organizing and conducting an effective environmental audit is identifying the appropriate mix of assessment and verification necessary to meet company goals and objectives.

Company and operational activities that may be examined in environmental audits include:

- regulatory compliance;
- operational procedures;

- employee training;
- emergency response;
- internal organization; and,
- general housekeeping.

3.3.4 Auditing Criteria

Auditing criteria can be defined as laws, regulations, standards, policies, practices and procedures against which the auditor compares collected evidence about the subject matter to determine the degree of conformity.

Currently within the field of environmental auditing there have evolved accepted basic environmental auditing principles, procedures and standards. These auditing principles, procedures and standards were developed from guidelines set out by such organizations as CAPP, the American Gas Association, Associated Environmental Site Assessors of Canada Inc., and the Canadian Standards Association.

Government and industry have recognized a need for the development of a standard to audit against. The development of an auditing standard can be based on the use of either external or internal standards. Examples of these external and internal standards are presented below.

External Standards

External standards include:

- legislation;
- licences; and,
- guidelines.

Internal Standards

Internal standards include:

- corporate policies;
- corporate guidelines;
- corporate standards;
- industry association guidelines;
- facility guidelines;
- good industry practice; and,
- codes of practice.

3.3.5 Types of Environmental Audits

There are basically two types of environmental audits.

- Operational Audits are used for company management and operational purposes.

- Commercial Transaction Audits (or property acquisitions and divestiture audits) are used for business transactions for either the selling or purchasing of properties.

3.3.6 Benefits of Audits

The benefits of each type of audit are described below.

Operational Audits

The operational audit provides management with the corporation's record of compliance. It also reviews the systems of internal management and control and identifies existing or potential problem areas.

This type of auditing has emerged as an effective environmental management tool. By identifying existing or potential problems, companies can benefit from:

- early warning and detection of problems;
- compliance with regulations;
- verification of the effectiveness of established environmental management policies;
- collection of information for liability insurance programs;
- identification of cost savings; and,
- help in the development of a facility rehabilitation budget.

Commercial Transaction Audits

The implementation of environmental auditing procedures is increasing in commercial transactions. This is often a result of the purchaser's due diligence but it may also be a pre-condition to a lender's loan advance. Audits may be required to ensure securities' regulatory disclosure requirements are discharged. Municipal planners and development control officers are also requesting audits before they will issue development permits for industrial lands. In addition, land developers are initiating environmental audits to protect themselves prior to the purchase of land.

Commercial transaction audits can provide:

- information that is valuable to the decision-making process in land purchases and divestments;
- increased property value;
- enhanced saleability of the land; and,
- enhanced public relations and market development.

3.3.7 Audit Activities

Audit activities can be divided into:

- pre-audit activities;
- audit activities; and,

- post-audit activities.

Pre-Audit Activities

These activities are necessary to effectively prepare the audit team so they are able to complete the work and minimize the time spent at the facility. These activities include:

- obtaining approval from facility senior management;
- selecting the audit team;
- understanding the audit purpose;
- selecting representative facilities;
- scheduling and arranging the logistics of the audit;
- collecting background information;
- reviewing relevant environmental criteria; and,
- preparing interview questionnaires.

Audit Activities

In general, audit activities on site should be directed toward:

- verification of information collected about the site;
- identification of deficiencies;
- examination of problems;
- review of documentation; and,
- verification through a field inspection.

These on-site activities include conducting a kickoff meeting, reviewing records, conducting interviews and field inspections, and a closeout meeting.

As a rule, the auditors should have a set of questions and directions specific to the activity or facility they intend to audit. This checklist will help to direct the audit and reduce concerns about confidentiality by asking respondents to provide information specifically associated with an activity or a facility, rather than issues that can be tied to individuals.

An audit checklist should examine:

- 1) Policy—Are policies for compliance available? Is there evidence that facility personnel are aware of and understand the policies as they relate to their particular duties?
- 2) Regulations—Do facility workers know and comply with all company standards and local, provincial and federal legislation? Are copies of these standards and legislation readily available? Are implications for non-compliance understood and are permits current with the copies available?
- 3) Plant and Design Operations—Is all environmental protection equipment installed and performing well enough to comply with legislation, and is the equipment technologically advanced to provide the best protection available? (This latter concern may be beyond the expertise of environmental auditors)

and stresses the need for teamwork by a group of professionals involved in the audit.)

- 4) Operating Procedures and Practices—Do written operating procedures exist, including emissions, effluent and solid waste management practices required by legislation and industry standards? Are they understood and followed?
- 5) Source Monitoring—Are quantities and qualities of wastes and emissions from facility operations monitored regularly, and is the status of compliance demonstrated through these monitoring programs?
- 6) Maintenance—Does maintenance provide prompt corrective action where equipment contributes to environmental risk?
- 7) Monitoring of Effects of Emissions and Wastes on the Environment—Is the monitoring program effective? How often are samples taken? Have appropriate remedial actions been taken?
- 8) Spill Contingency Measures—Are written emergency response procedures available, up-to-date, and easily understood? Do they include contingency plans and necessary resources to handle incidental discharges?
- 9) Incident Reporting and Remedy—Are reports prepared that detail incidental discharges, follow-up activities and corrective actions to prevent recurrence?
- 10) Environmental Training—Are workers aware of the environmental implications of their operations? Is the flow of information effective in promoting awareness and providing necessary details? Do workers have ready access to technical literature, publications and education programs?
- 11) Contractor Selection and Performance—Are contractors aware of company policy? Do they have good environmental records? Are responsibilities clearly defined and does the company monitor the work performed by the contractors it hires?
- 12) External Communication—Is there a system set up to deal with complaints and requests for information from external sources?
- 13) Education and Training—Who is trained and what is the frequency and method of training?
- 14) Environmental Programs—What special past, present and future programs does the facility have for unique problems?

Post-Audit Activities

Generally, post-audit activities consist of the structured evaluation of the audit against pre-established criteria and objectives.

The audit is evaluated for consistency, continuity and corporate compliance. The audit is scored and conclusions and recommendations are provided. The results are communicated to the company in a report summarizing:

- deficiencies in environmental management and control systems;
- official violations;
- good practices;
- strengths of the facility's environmental program;
- ability of the facility to handle environmental risks;

- cost effectiveness of operations; and,
- permit status.

3.3.8 Importance of Audit Consistency

Each environmental audit should rely on comparable methods and procedures for reporting, particularly if the company wants to collect long-term measures. Such consistency will also provide operations and management personnel the opportunity to develop an historic record of ongoing facility compliance, both within and between sites.

3.3.9 Audit Continuity and Regulatory Actions

Should regulatory actions commence, or be considered by government, the continuity provided by regular facility audits may be an important component of a legal defense strategy. Due diligence, or a demonstration of long-standing environmental protection, may discourage regulatory agencies from punitive action, or may appeal to judges who are charged with hearing evidence. Hence, a measure of corporate compliance over time is an important internal and external management tool.

3.3.10 References

Canadian Association of Petroleum Producers, January 1991. *Environmental Audit Guidelines for Pipelines*. Pub. No.1991-0001.

These guidelines consist of a series of questions under the following categories: Environmental Management/Planning Operating Procedures, Spill Prevention, Hazardous Materials/Waste Management, Environmental Monitoring, Construction, Abandonment, Decommissioning and Reclamation.

Canadian Standards Association, 1996. *CAN/CSA-ISO 14010-96, Guidelines for Environmental Auditing—General Principles*.

This International Standard provides the general principles of environmental auditing that are applicable to all types of environmental audits. Any activity defined as an environmental audit in accordance with this International Standard should satisfy the recommendations given in it.

Petroleum Industry Training Service, 1997. *Environmental Auditing in the Petroleum Industry*.

This manual is designed to give those required to do site inspections or formal audits the basics in petroleum industry environmental auditing and practical tips to make this job easier and more effective.

3.4 Environmental Impact Assessments

see also . . .

- + Section 2.2, About Your Environmental Liabilities
- + Section 3.5, Cumulative Effects Assessments
- + Section 4.4, Environmental Approvals and Applications

3.4.1 Environmental Assessment Act

The following information has been extracted from the February 2001 *Brochure for the EAO Process Guide*³, published by British Columbia's Environmental Assessment Office:

British Columbia's *Environmental Assessment Act* became law in June 1995 and established a process for assessing the impacts, both positive and negative, of large-scale development proposals. The purpose of the environmental assessment process is to ensure that new developments or major modifications to existing projects support sustainability goals in British Columbia.

The environmental assessment process provides a consistent, comprehensive review that balances economic, environmental and social concerns, and also addresses cultural, heritage and health issues.

The process provides for a thorough, timely and integrated assessment of any foreseeable adverse impacts throughout the life cycle of a project including construction, start-up, operation and shutdown. The intent of the process is to determine whether or not there are ways to eliminate, minimize or mitigate those impacts, or to compensate for them.

The environmental assessment process is open and accountable and administered by a neutral agency—the Environmental Assessment Office. At every stage of the review, the process provides opportunities for appropriate and meaningful participation by the proponent, the public, First Nations and any relevant government agencies, including those from neighbouring jurisdictions.

Types of Projects Reviewed

The Reviewable Projects Regulation defines the types and sizes of projects that are automatically subject to an environmental assessment. The review takes into account the facilities at the main site and may consider offsite facilities or related activities that could have an impact. For example, the review of a proposed pulp mill would consider the impact of transporting material to and from the mill.

³ For more detailed guidance, refer to the *Guide to the British Columbia Environmental Assessment Process*.

The Minister of Sustainable Resource Management has the power under the Act to order an environmental assessment for a project that does not fit under any of the specified categories in the Reviewable Projects Regulation. Such a decision is only made if the Minister is convinced the project has the potential for a significant adverse effect and a review under the Act is in the public interest.

Proponents are responsible for knowing if their projects meet or exceed the thresholds set out in the Reviewable Projects Regulation, and when their projects must be reviewed under the Act. Energy projects subject to review include:

- Electric transmission lines
- Energy storage facilities (*i.e.*, a facility capable of storing an energy resource that can yield 3 PJ or more of energy by combustion; naturally occurring underground reservoirs in the Western Canadian Sedimentary Basin used for storing oil or gas are excluded.)
- Facilities that use, convert or process energy resources
- Natural gas process plants (*i.e.*, plants designed to process $5.634 \times 10^6 \text{ m}^3$ (200 Mmscf) or more of natural gas per day, and/or to emit 2 t or more of sulphur per day to the atmosphere.)
- Oil and gas pipelines (*i.e.*, pipelines with diameter length dimensions of $\leq 114.3 \text{ mm}$, 60 km or more; > 114.3 and $\leq 323.9 \text{ mm}$, 50 km or more; $> 323.9 \text{ mm}$, 40 km or more.)
- Power plants
- Offshore oil and gas facilities

Key Features of the Review Process

Single and Consistent

The Act offers a single, consistent process for conducting project assessments. Depending on the completeness of the initial application, reviews range from one to three stages. The second and third stages focus on issues that were not resolved at previous stages. Decisions are made at the end of each stage and public and First Nations' input is encouraged throughout.

Balanced Decision-Making

For one- or two-stage reviews, the Act requires joint decision-making by the Minister of Sustainable Resource Management and a second appropriate minister. For example, the Minister of Energy and Mines is responsible for mining and energy projects. After a third stage, Cabinet would make the decision. Participation is encouraged from all levels of government, First Nations, and the public. Proponents are required to consult with the public and First Nations.

Clear Timelines

Specific timelines are defined for the government-controlled part of the process. Clear timelines allow participants to plan their activities with greater certainty.

Other Permit and Licence Reviews

Proponents have the option of requesting that the environmental assessment review be conducted concurrently with the review of other permits or licences. If the proponent's plans are sufficiently developed to take advantage of this, it can result in a more timely issuing of permits. During an environmental assessment, the Environmental Assessment Office compiles preliminary information requirements for various permits for the project. If a certificate is issued, an appropriate agency is selected to coordinate permitting and other activities.

Canada-British Columbia Cooperation

When a project triggers both federal and provincial environmental assessment legislation, governments have agreed to cooperate in a joint review. A single window reduces duplication and overlap, and avoids unnecessary costs, delays and uncertainty. At the end of a joint review, each government makes a separate decision on the project.

Neutral Administration

The Environmental Assessment Office functions as the central contact point for each review. The office is responsible for delivering the process in an open, accountable and neutral manner.

Project Committees

A project committee is established for each project, consisting of representatives from provincial ministries, federal departments, First Nations, local governments, and relevant neighbouring jurisdictions.

The committee provides advice, analysis and recommendations on a project under review, including a report and recommendations for decisions by the ministers.

Stages of the Review Process

There are potentially three formal stages in any environmental assessment:

- application review;
- project report review; and,
- public hearing.

Project reviews may conclude at the end of Stage 1 or 2 if all issues have been resolved. Projects requiring a public hearing to assist in the resolution of outstanding concerns go through all three stages. Figure 3-1 illustrates the stages of the review process.

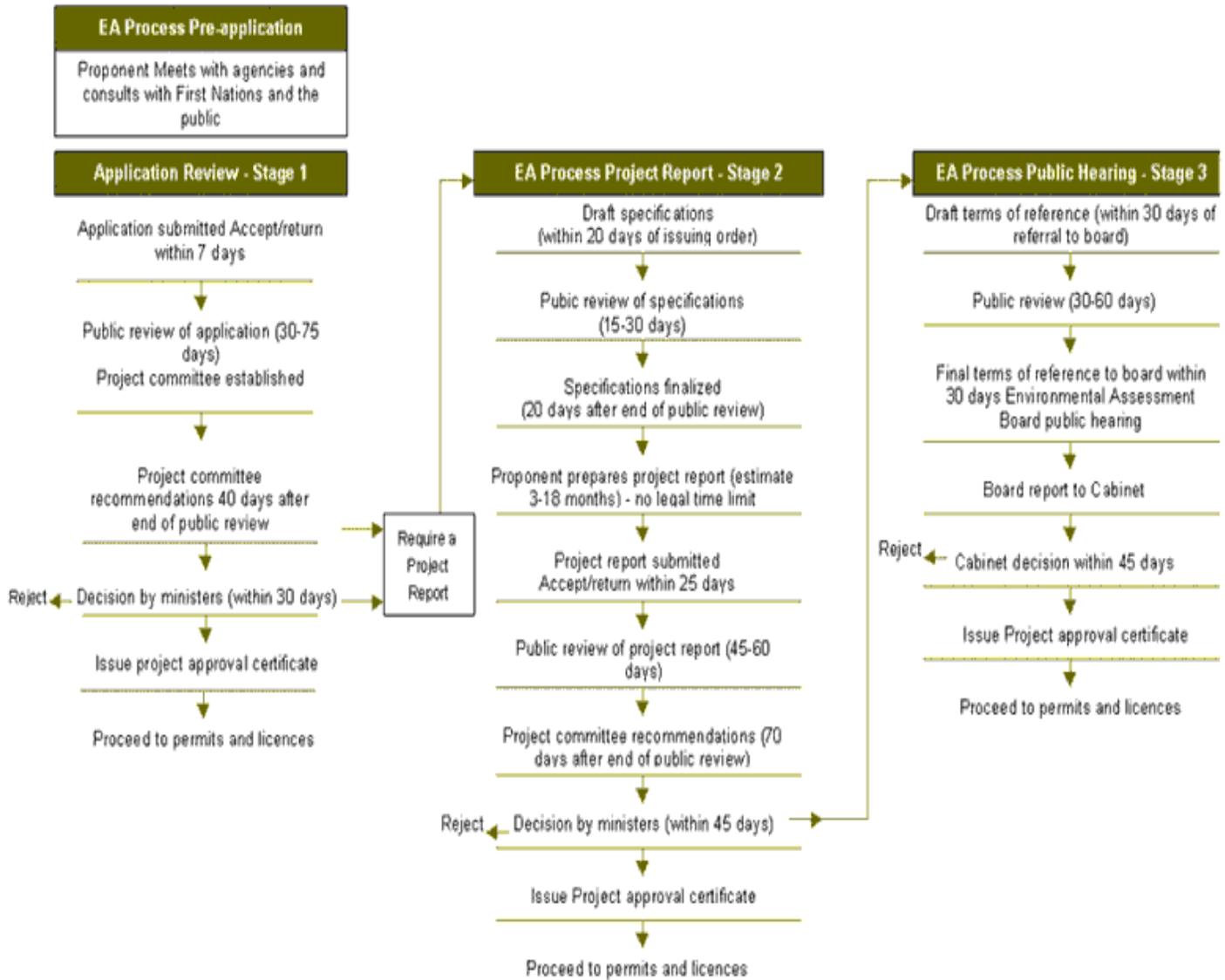


Figure 3-1: Environmental Assessment Review Process

Figure source: http://www.eao.gov.bc.ca/PUBLICAT/pro_guide2001/img/process_diagram.gif

Pre-Application

Although not a legal requirement under the Act, most proponents engage in pre-application consultations prior to the formal review process. When a proponent such as a company, utility or municipality proposes a large-scale development or modification to an existing development, it is encouraged to meet with staff from the Environmental Assessment Office and other agencies, as well as to consult with First Nations and the public.

This pre-application phase is a time when the proponent can determine if a project is subject to the Act. It allows time for learning about the review process and facilitates discussions about the project concept. It also gives the proponent an opportunity to acquire information on consultation requirements with the public and First Nations. Effective consultation at this stage helps to identify the issues that will require attention during the formal review.

These early discussions allow the Environmental Assessment Office to:

- discuss the review process, legal requirements, format and content of an application; and,
- assist in identifying appropriate information sources and contacts.

The discussions allow the proponent to learn about:

- current land use and resource management plans related to the project;
- public and First Nations' views; and,
- associated permit review processes.

Proponents can use this pre-application period to hold public meetings, collect and analyze available data, identify key issues and major data gaps, and begin the collection of baseline information where, and if, gaps exist.

Stage 1: Application Review

Proponents of reviewable projects submit a formal application for a project approval certificate to the Environmental Assessment Office. The office screens the application, accepts it if it complies with the Act, and within seven days of receipt of all necessary copies, circulates it to government agencies and First Nations for comment. The office establishes a project committee consisting of representatives from various levels of government and First Nations. The general public is notified that the application is available for review and that there is a specified time period (30 to 75 days) to comment.

The members of the project committee normally complete their initial review of the application during the same 30 to 75 day period. The project committee then has up to 40 days to conclude its review and develop committee recommendations on the application, taking into account all comments from the public, other interested agencies, and First Nations.

At this point, the committee decides whether the project should be referred to the Minister of Sustainable Resource Management and a second appropriate minister for a decision. If project committee recommendations are forwarded to the two ministers, they have a maximum of 30 days to reach a decision.

Some projects are straightforward (*i.e.*, all the potential problems have been identified, analyzed and resolved) and a final decision can be reached at this point. The Act requires that projects with unresolved issues proceed to the second stage.

Stage 2: Project Report Preparation and Review

The project committee develops draft specifications for the project report that define additional information requirements. These specifications are circulated to the proponent as well as to relevant government agencies, First Nations, and the general public. After a public comment period of 15 to 30 days, the specifications are finalized and given to the proponent. The time taken by the proponent depends on the complexity of the project and the circumstances of the proponent. There is no legislated time limit for completion of a project report.

After the project report has been submitted, it is screened to ensure it meets the project report specifications. Once accepted by the project committee for review, it is circulated to government agencies, First Nations and the public. Following a 45 to 60 day public review period, the project committee has 70 days to analyze the report, taking all public, First Nations and agency submissions into account. The committee then provides its recommendations to the two ministers responsible for approving or rejecting the project.

The two ministers have 45 days to review the project documentation and the committee's recommendations and make a decision. Ministers may certify the project with conditions, reject it, or if they feel there are still unresolved issues, forward the application to the Environmental Assessment Board for a formal public hearing.

Stage 3: Environmental Assessment Board Hearing

If a project under review requires a public hearing, the two ministers prepare the draft terms of reference. They specify which issues need to be addressed and they may require that specific permits and licences related to the application be considered as part of the hearing. The public is invited to comment on the draft terms of reference for the hearing before they are finalized by the ministers.

There is no specific timeline for the public hearing process. After the hearing has taken place, the Environmental Assessment Board submits a final report and recommendations to the full Cabinet.

Cabinet then has up to 45 days to reach a decision to approve or reject the project. If approved, the project is formally authorized to proceed.

Final Decision

For projects that go through either the first stage, or the first and second stages, of the environmental assessment process, final project approval decisions are made by two provincial Cabinet ministers: the Minister of Sustainable Resource Management and the appropriate minister responsible for a particular category of the reviewable project. Projects that require a public hearing (Stage 3) are submitted to Cabinet for a final decision to approve or reject the project.

Once a project approval certificate has been issued, along with any necessary operational permits and licences, then the project may proceed.

Length of Review Process

Timelines for the government-controlled portion of each stage of the review are set out in the Prescribed Time Limits Regulation. The timelines are intended to accommodate projects of differing scope and complexity. The timelines for public comment have a stipulated range to guarantee adequate notification while ensuring the review process proceeds in an efficient manner. Ministerial approval is required for the extension of any time limits.

No time limits are specified for proponent activities. The length of the review process depends on the complexity of the issues raised by a project and could range from as little as three months to more than three years, if a public hearing is required.

3.4.2 Waste Management Act

The following sections of the *Waste Management Act* allow a manager (of MWLAP) to request information: Section 10, Permits; Section 11, Approvals; and other sections such as Section 31, Pollution Abatement Orders; Section 33, Pollution Prevention Orders. Section 8, Additional Information, of the Oil and Gas Waste Regulation allows MWLAP to request environmental impact assessments to determine whether discharges, such as those authorized under the Regulation, are causing or may cause any adverse effects.

3.4.3 Environment Management Act

Section 3, Environmental Assessment, of the *Environment Management Act* states:

“If the minister [of the Ministry of Sustainable Resource Management] considers that a person proposes to do anything that would have a detrimental environmental impact, and that the environmental impact cannot be assessed from information available to the minister, the minister may require the person to supply an environmental impact assessment in respect of that thing, prepared in accordance with the regulations.”

The assessment may be required to include information on the detrimental and beneficial impacts on:

- water quality;
- air quality;
- land use;
- water use;
- aquatic ecology; and,
- terrestrial ecology.

These requirements are listed in the Environmental Impact Assessment Regulation.

Note: The *Environment Management Act* has not yet been applied to upstream oil and gas projects.

3.4.4 References

Environmental Assessment Act, R.S.B.C. 1996, c. 119.

Environmental Assessment Prescribed Time Limits Regulation.

Environmental Assessment Reviewable Projects Regulation.

Environmental Assessment Office, January 2001. *Guide to the British Columbia Environmental Assessment Process*.

This guide describes the application information requirements for projects that must undergo environmental assessment (EA) under the *Environmental Assessment Act*, and the process for reviewing and making decisions on such projects. The guide is intended to assist proponents, First Nations and the public in understanding the EA process, and to promote good practice.

Environment Management Act, R.S.B.C. 1996, c. 118.

Environmental Impact Assessment Regulation.

3.5 Cumulative Effects Assessments

see also . . .

+ Section 2.2, About Your Environmental Liabilities

+ Section 3.4, Environmental Impact Assessments

3.5.1 Introduction

The concept of cumulative environmental effects recognizes that the environmental effects of individual human activities can combine and interact with each other to cause aggregate effects. Cumulative effects can be defined as “effects on the environment that result from the effects of one project combined with others from past, existing and imminent projects and activities.” These may occur over a certain period of time or distance.

3.5.2 When Cumulative Effects Assessments Are Required

Cumulative effects assessments are normally required whenever an environmental impact assessment is needed. The *Canadian Environmental Assessment Act* requires consideration of cumulative effects that are likely to result from the project in combination with other projects or activities that have been, or will be, carried out.

Project reports that are prepared under the *Environmental Assessment Act* may also be required to consider probable cumulative effects of the project.

3.5.3 References

Canadian Environmental Assessment Act, 1992, c. 37.

Canadian Environmental Assessment Agency, February 1999. *Cumulative Effects Assessment, Practitioners Guide*.

The purpose of this guide is to provide practitioners with an overview and clarification of the current understanding of the practice of Cumulative Effects Assessments (CEAs). It also provides suggestions on practical approaches to complete CEAs that meet statutory requirements and best professional practice, and case studies of approaches used by project proponents for their CEAs.

Canadian Environmental Assessment Agency. *Reference Guide: Addressing Cumulative Environmental Effects*.

This reference guide describes an approach for addressing cumulative environmental effects under the *Canadian Environmental Assessment Act*. This guide reviews the concept of cumulative environmental effects, discusses the relevant requirements of the Act, outlines some general considerations, proposes a framework for addressing cumulative environment effects under the Act, and provides a list of key references on the subject.

Cumulative Effects Assessment in Canada: From Concept to Practice, Papers From the Fifteenth Symposium Held by the Alberta Society of Professional Biologists, Calgary, 1994. Edited by Alan J. Kennedy.

Environmental Assessment Act, R.S.B.C. 1996, c. 119.

Environmental Assessment Reviewable Projects Regulation.

Environmental Assessment Office, January 2001. *Guide to the British Columbia Environmental Assessment Process*.

This guide describes the application information requirements for projects that must undergo environmental assessment (EA) under the *Environmental Assessment Act*, and the process for reviewing and making decisions on such projects. The guide is intended to assist proponents, First Nations and the public in understanding the EA process, and to promote good practice.

3.6 Environmental Monitoring

see also . . .

+ Section 2.2, About Your Environmental Liabilities

+ Section 3.7, Risk Assessments and Risk Management

3.6.1 Introduction

Environmental monitoring programs are tools that companies use to detect potential contaminant problems at an early stage.

The benefits of environmental monitoring include:

- protecting the health and safety of workers, the public, wildlife, and livestock;
- protecting environmental quality on- and off-lease;
- cost savings through early detection and correction of problems; and,
- more effective management of environmental liabilities.

Monitoring programs allow operators to help determine the source of the problem, work to stop the emission problem at the source, and plan for or modify a remediation program if required.

To ensure the monitoring program is a useful planning or verification device, it should be properly designed by qualified personnel and sample collection and recording should be conducted using accepted protocols and quality controls. For example, in a groundwater monitoring program, if piezometers are placed in positions that do not accurately reflect local groundwater conditions or that do not accurately reflect potential contaminant sources at the facility, off-lease contaminant migration in groundwater may not be accurately detected.

3.6.2 Monitoring Requirements

Operators may be required by MWLAP to develop environmental monitoring programs to determine whether discharges are causing or may cause any adverse effects. Companies are also responsible for initiating a site investigation and monitoring program if a contaminant problem is suspected at a site, or to ensure that remediation complies with the remediation plan or applicable standards. Environmental monitoring may also be required by other agencies. For example, MOF may require monitoring to manage range and wildlife habitat.

Companies may decide to conduct environmental monitoring beyond regulatory requirements as part of a risk management program or environmental management system.

3.6.3 Environmental Monitoring Program Components

An environmental monitoring program should be carefully planned so the results of the program actually reflect the conditions being monitored.

The monitoring program should be continually assessed to ensure it meets the current conditions of the facility. For example, if a process is changed or added, the operator should ensure the monitoring program is designed to sample for potential new emission sources of concern. Furthermore, if monitoring is conducted as part of a cleanup or site remediation program, the monitoring techniques selected must be suitable for adequately measuring the constituents or parameters being investigated.

3.6.4 Operational Issues

Each facility should retain a copy of its authorization and facility managers should ensure all conditions related to environmental monitoring are met.

All monitoring equipment and instrumentation should be inspected and maintained on a regular basis.

Samples should only be collected using proven and appropriate sampling methods by trained and qualified personnel.

Laboratories responsible for analyzing samples collected as part of a monitoring program should have recognized quality assurance and quality control programs in place. If the data will be used for assessing regulatory compliance under the *Waste Management Act*, provincially-approved methods of analysis must be used and the laboratory performing the analyses must be registered with the Canadian Association for Environmental Analytical Laboratories (CAEAL). Companies may be required to redo sampling and analysis if they used the wrong methods.

When required, monitoring reports should be completed and submitted to the Commission and/or MWLAP on a regular schedule, or as dictated by regulatory approvals.

3.6.5 References

Waste Management Act, R.S.B.C. 1996, c. 482.

Contaminated Sites Regulation.

Oil and Gas Waste Regulation.

3.7 Risk Assessments and Risk Management

see also . . .

+ Section 2.2, About Your Environmental Liabilities

+ Section 3.6, Environmental Monitoring

3.7.1 Introduction

Forest Practices Code

The following information is from the document *Managing Risk Within a Statutory Framework: The Forest Practices Code*:

“Risk is the potential for loss or damage resulting from an action or decision. One of the most challenging aspects of forest management in general, and the Forest Practices Code [Forest Practices Code of British Columbia Act] in particular, is the approach to risk. The underlying goal is not to avoid or eliminate it, but rather to assess and manage it. In doing this we must recognize not only the potential loss or damage, but also the potential benefits.

Risk assessment is the process of determining the likelihood of loss or damage occurring and the magnitude of the consequences should the loss or damage occur. Risk management is the ‘art’ of weighing the assessed risks against the expected benefits to make the ‘best’ forest management decision.”

Under the *Forest Practices Code*, risk is managed at four distinct stages:

- 1) During the development of the legislative framework;
- 2) When operational plans are prepared and approved;
- 3) During compliance activities, including the licensee’s internal “quality assurance” inspections, as well as inspections carried out by Forest Service and other government officials; and,
- 4) When enforcement actions are taken by Forest Service or other government officials.

These steps are to some extent hierarchical. How risk is managed at earlier stages will determine in part how it will have to be managed at later stages.

For additional information relating to risk management principles underlying the *Forest Practices Code*, refer to the MOF Compliance and Enforcement Branch's website at <http://www.for.gov.bc.ca/enforce/index.htm>.

Waste Management Act

The remaining information in this section relates to risk assessment under the *Waste Management Act*.

Risk assessment and risk management tools can be used to manage environmental impacts at contaminated sites. A contaminated site is defined in Section 26 (1), Definitions and Interpretations, of the *Waste Management Act* as “*an area of land in which the soil or any groundwater lying beneath it, or the water or the underlying sediment, contains:*

(a) a special waste, or

(b) another prescribed substance in quantities or concentrations exceeding prescribed criteria, standards or conditions.”

Section 11, Definition of a Contaminated Site, of the Contaminated Sites Regulation, describes (b) as

“*a site at which:*

(a) the land use is agricultural, commercial, industrial, urban park or residential, and the concentration of any substance in the soil at the site is greater than or equal to:

(i) the applicable generic numerical soil standard, or

(ii) the lowest value of the applicable matrix numerical soil standards.

(b) the surface water or groundwater which is located on the site, or flows from the site, is used, or has a reasonable probability of being used, for aquatic life, irrigation, livestock or drinking water use, and the concentration of any substance in the surface water or groundwater is greater than or equal to the concentration of that substance specified for that use in Schedule 6, or

(c) the concentration of any substance not specified in Schedule 4, 5 or 6 in soil, surface water or groundwater is greater than or equal to the concentration established in a standard for that substance and use by the director.”

Note: Refer to the *Waste Management Act* and Contaminated Sites Regulation for the complete wording of these sections. Section 11 of the Regulation also includes definitions for sites that are *not* contaminated.

Risk assessment is defined under the Regulation as a “*systematic process of identifying and evaluating substances, persons potentially affected, and exposures to the substances in order to estimate cancer risks or hazard indices in accordance with a protocol approved by the director under section 53.*” Risk management is also defined under the Regulation as “*actions, including monitoring, designed to prevent or mitigate human health or environmental impacts of any contamination at a site.*”

The risk assessment process uses a mathematical model to predict the risks that humans, plants and animals may encounter at a site. This model involves hazard assessment, dose-response assessment, exposure assessment, risk characterization, and uncertainty analysis. Figure 3-2 illustrates exposure pathways, including air, soil and water, that are considered in risk assessments. Exposure mechanisms include ingestion, dermal contact and inhalation. For risk to be realized, the exposure pathway to a receptor must be complete.

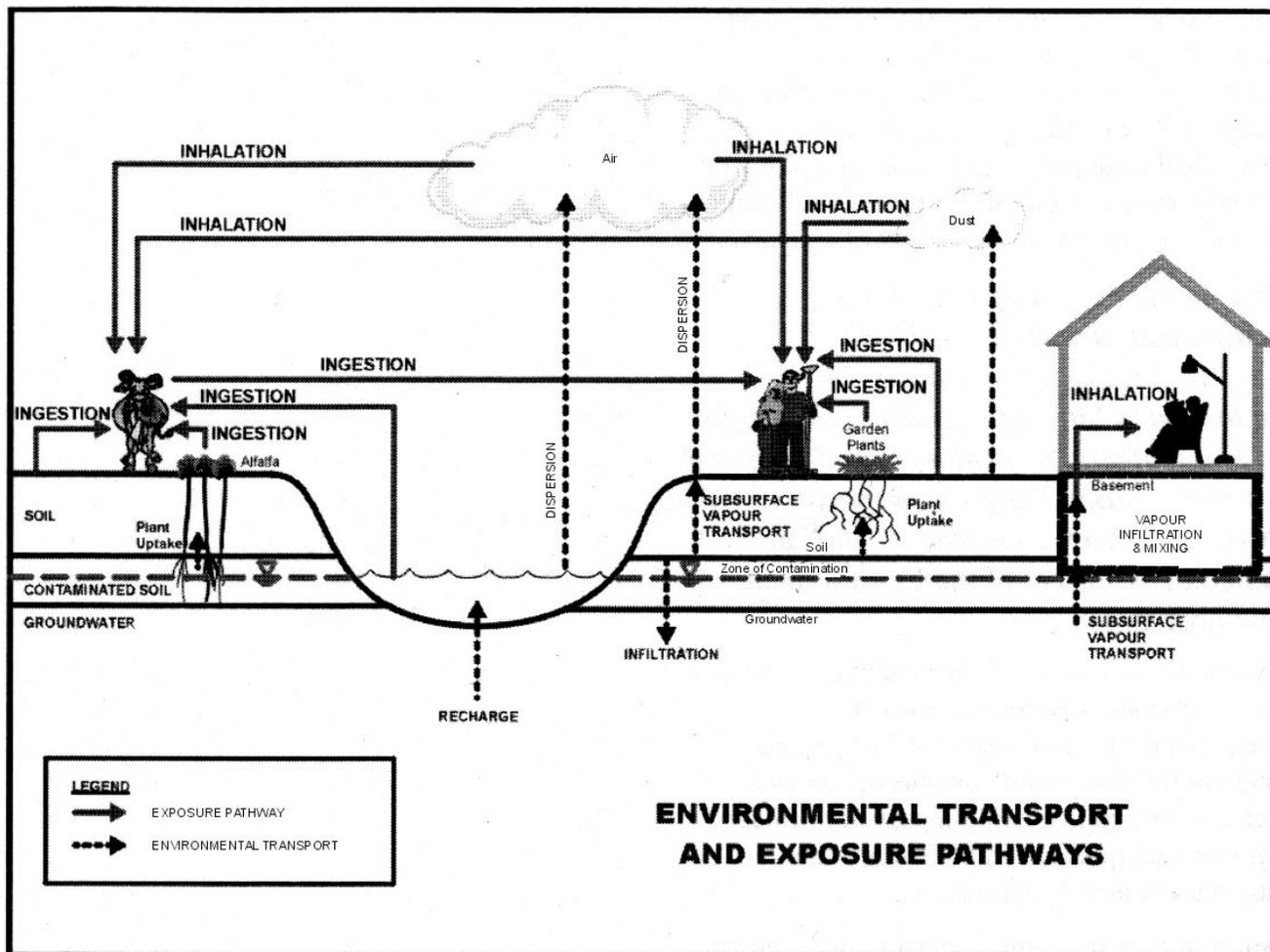


Figure 3-2: Receptors and Exposure Pathways for Risk Assessment

3.7.2 Information Requirements

Data requirements for a risk assessment are more detailed than for an environmental impact assessment or a site characterization. Information requirements for risk assessment generally include:

- possible land use(s);
- chemicals of concern;
- exposure pathways;
- receptor inventory; and,
- exposure point concentrations of chemicals.

This information is incorporated into exposure models to predict the potential risk to a receptor, or to determine remediation objectives that are protective of human health or the environment.

Under the Contaminated Sites Regulation, risk assessment can only be used within a site-specific context. This means that every risk assessment is unique to the site for which it was prepared; however, every risk assessment will provide the following types of information:

- documentation of the substances at a site, their location and the extent of any contamination occurring on- and off-site;
- estimation of the size and likelihood of risks and hazards to human and non-human receptors on- and off-site; and,
- documentation and evaluation of the effectiveness of measures proposed to manage contamination.

3.7.3 Regulatory Process

There are two general approaches in the Contaminated Sites Regulation that site owners and operators may use to establish environmental quality standards for a site:

- numerical standards that define acceptable concentrations of substances in soil, surface water and groundwater; or,
- risk-based standards that define acceptable risk levels from exposure to substances at sites.

The standards can be used in several ways to protect the environment and human health. Specifically:

- to determine if a site is contaminated;
- to determine when a site has been adequately cleaned up; and,
- to control soil relocation to avoid contaminating other sites.

In the Regulation, numerical soil and water standards are used to determine if a site is contaminated. Following that determination, site owners and operators may choose either the numerical or risk-based standards to determine if a site has been satisfactorily cleaned up.

Section 18 of the Regulation specifies how risk-based standards are used for remediation. Figure 3-3 shows the general process of managing risks to human health if the risk-based standards are selected to establish remediation requirements for a site.

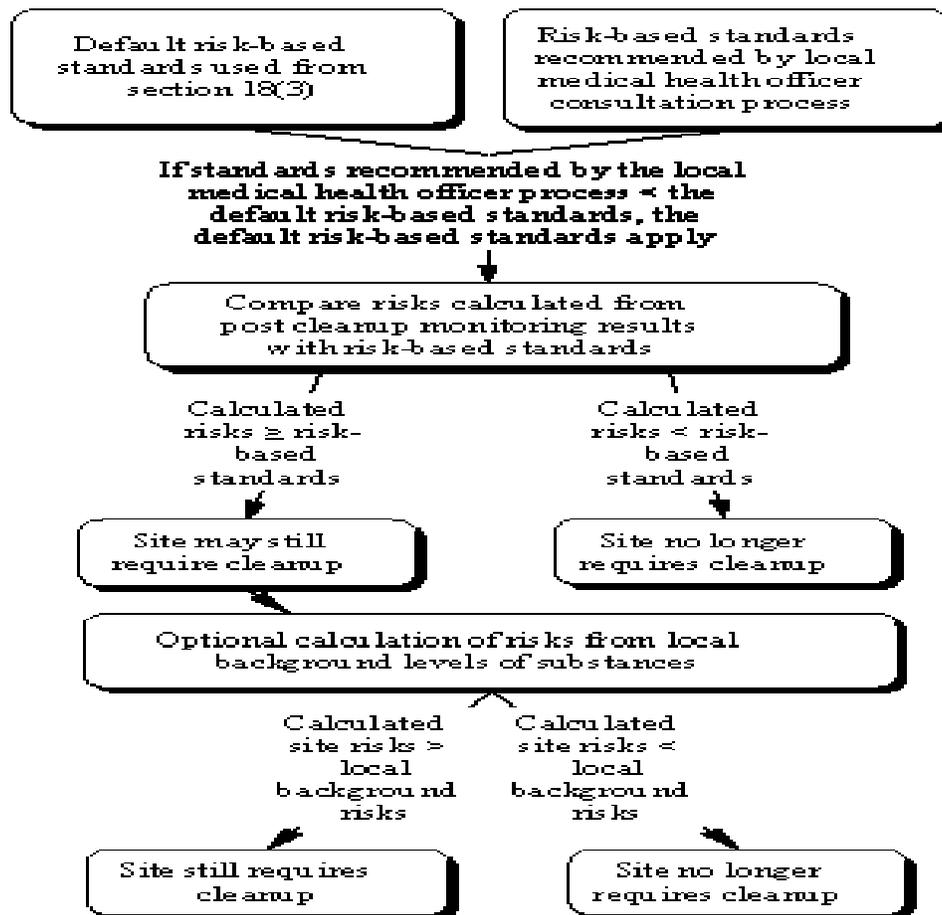


Figure 3-3: Cleanup Process Using Risk-based Remediation Standards

The individual who applies the risk-based standards must also prepare an environmental impact report describing:

- the potential on-site and off-site environmental impacts of any substances causing contamination before and after remediation; and,
- procedures, including monitoring, designed to mitigate any significant potential impacts identified in paragraph (a) and Protocol 1, *Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia*.

The MWLAP regional Pollution Prevention Manager may require mitigation of the impacts identified in the report or through other available data.

3.7.4 Risk Assessment Approaches

There are two approaches to establish risk-based standards for a site. Normally, the site owner would find it most straightforward to adopt the default risk-based standards specified in Subsection 18(3) of the Regulation:

(a) [if] for any non-threshold carcinogenic substance, the calculated human lifetime cancer risk due to exposure to that substance at the site is less than or equal to one in 100 000; and

(b) for any substance for which a hazard index is calculated, the hazard index due to exposure of a human to that substance at the site is less than or equal to one.

A person may also request that the local medical health officer recommend alternate risk-based standards to a regional Pollution Prevention Manager. These would be developed through a public community-based consultation process, which is paid for by the person making the request and facilitated by the local medical health officer. Details of this process are provided in Section 18 of the Regulation.

Comparison of Risk-based Standards with Risks for Post Cleanup Monitoring Results

In order to use the risk-based standards, the risks due to exposure to residual substances in the soil after risk management measures have been implemented must be calculated. Often this involves complex technical and scientific analysis. If a risk calculated for a substance at the site is less than or equal to the risk-based standard, then the MWLAP regional Pollution Prevention Manager will consider the site satisfactorily remediated.

Optional Comparison with Background Risks

As with the numerical standards approach, a person may not have to undertake remediation of a site if the risk-based cleanup standards are exceeded, depending on the background levels of the substances involved. If it can be demonstrated to a MWLAP regional Pollution Prevention Manager that the local background level of a substance at a site results in a risk which exceeds the standard for that substance, then the risk-based standard will be set at the risk for exposure to the background level of the substance at the site. As a result, a risk assessment may not need to be conducted and therefore, no remediation will have to be done.

3.7.5 References

Forest Practices Code of British Columbia Act, R.S.B.C. 1996, c. 159.

Ministry of Forests, Compliance and Enforcement Branch's website:

<http://www.for.gov.bc.ca/enforce/index.htm>.

Ministry of Forests, March 1999. *Managing Risk Within a Statutory Framework: The Forest Practices Code*.

Ministry of Water, Land and Air Protection, Contaminated Sites Program website: http://wlapwww.gov.bc.ca/epd/epdpa/contam_sites/index.html.

Includes guidance documents, protocols and procedures, analytical methods and other reference documents for remediating contaminated sites in British Columbia, such as:

Ministry of Water, Land and Air Protection, January 1998. *Protocol 1, Recommended Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia*.

Ministry of Water, Land and Air Protection, April 2000. *Fact Sheet 14—Facts on Contaminated Sites, Demystifying Risk Assessment*.

Ministry of Water, Land and Air Protection, November 15, 2000 (last update). *Guidance Document 16—Technical Guidance on Contaminated Sites, Soil Sampling Guide for Local Background Reference Sites*.

Ministry of Water, Land and Air Protection, April 10, 2001 (last update). *Guidance Document 3—Technical Guidance on Contaminated Sites, Environmental Quality Standards*.

Waste Management Act, R.S.B.C. 1996, c. 482.

Contaminated Sites Regulation.

Special Waste Regulation.

4 Regulatory Processes

There are many pieces of provincial and federal legislation, along with several regulatory bodies, that hold jurisdiction over the environmental impacts of oil and gas operations in British Columbia. This section provides a summary of the regulators and the environmental regulations they administer. Specifically, it:

- identifies regulatory agencies with environmental mandates applicable to oil and gas activities in British Columbia;
- describes the environmental approvals required by regulatory agencies and provides general steps for obtaining these approvals;
- describes how the regulatory agencies enforce regulatory requirements; and,
- provides a summary of government initiatives for classifying and managing sensitive issues.

For specific and current requirements, review current regulatory documents, contact the regulators directly, or obtain legal counsel.

4.1 Key British Columbia Regulatory Agencies

see also . . .

+ Section 4.3, Interjurisdictional Regulatory Issues

+ Section 4.5, Enforcement

To obtain information on the agencies referred to below, see the British Columbia Government's Ministries and Organizations website at <http://www.gov.bc.ca/bcgov/popt/orgs/>.

The website for legislation and regulations is <http://www.legis.gov.bc.ca/legislation/index.htm>.

To contact agency departments or individuals, search the BC Government Directory at <http://www.dir.gov.bc.ca/> or call Enquiry BC.

- In Vancouver dial: (604) 660-2421
- In Victoria dial: (250) 387-6121
- Elsewhere in BC dial: 1-800-663-7867

The Enquiry BC Call Centre is open Monday through Friday, 8 am to 5 p.m., Pacific Standard/Daylight Savings Time.

The Oil and Gas Commission can be reached at:
200, 10003 – 110 Avenue
Fort St. John, BC V1J 6M7
Phone: (250) 261-5700 Fax: (250) 261-5744

Website: <http://www.ogc.gov.bc.ca/>.

4.1.1 Introduction

Environmental impacts of upstream oil and gas operations are regulated primarily under the acts and regulations administered by the following government departments:

- Oil and Gas Commission (the Commission)
- Ministry of Energy and Mines (MEM)
- Ministry of Water, Land and Air Protection (MWLAP)

The following regulatory agencies may also play a role in environmental approvals for projects, depending on the area and circumstances:

- Ministry of Agriculture, Food and Fisheries (MAFF)
- Ministry of Community, Aboriginal and Women's Services (municipalities, safety services)
- Ministry of Forests (MOF)
- Ministry of Health Services (public health protection)
- Ministry of Sustainable Resource Management (MSRM)
- Regional Districts and Municipalities

4.1.2 Oil and Gas Commission

The Commission has statutory authority for regulating most aspects of the upstream petroleum industry in British Columbia. Based in Fort St. John, the Commission is a Crown corporation responsible for administering legislation pertaining to oil and gas activities. It assumes most of the oil and gas regulatory responsibilities formerly held by MEM, the Ministry of Environment, Lands and Parks (now held by MWLAP) and MOF. The Commission also has offices in Victoria and Fort Nelson.

The purposes of the Commission (as listed in Section 3 of the *Oil and Gas Commission Act*, S.B.C. 1998, c. 39) are to:

(a) regulate oil and gas activities and pipelines in British Columbia in a manner that:

- (i) provides for the sound development of the oil and gas sector, by fostering a healthy environment, a sound economy and social well being,
- (ii) conserves oil and gas resources in British Columbia,
- (iii) ensures safe and efficient practices, and
- (iv) assists owners of oil and gas resources to participate equitably in the production of shared pools of oil and gas;

(b) provide for effective and efficient processes for the review of applications related to oil and gas activities or pipelines, and to ensure that approved

applications are in the public interest having regard to environmental, economic and social effects;

(c) encourage the participation of First Nations and aboriginal peoples in processes affecting them;

(d) participate in planning processes; and

(e) undertake programs of education and communication in order to advance safe and efficient practices and the other purposes of the Commission.

The primary acts administered by the Commission for these purposes are the:

- *Petroleum and Natural Gas Act*, R.S.B.C. 1996, c. 361; and,
- *Pipeline Act*, R.S.B.C. 1996, c. 364.

In addition to these acts, the *Oil and Gas Commission Act* gives the Commission authority over specified sections of the following acts:

- *Forest Act*, R.S.B.C. 1996, c. 157;
- *Forest Practices Code of British Columbia Act*, R.S.B.C. 1996, c. 159;
- *Heritage Conservation Act*, R.S.B.C. 1996, c. 187;
- *Land Act*, R.S.B.C. 1996, c. 245;
- *Waste Management Act*, R.S.B.C. 1996, c. 482; and,
- *Water Act*, R.S.B.C. 1996, c. 483.

Organization of the Oil and Gas Commission

Two directors lead the Commission, which reports to the Minister of Energy and Mines—the Commissioner, who also acts as chair, and the Deputy Commissioner. In addition to the Commissioner’s Office, there are seven other branches that make up the Commission. The following section includes brief descriptions of these branches.

Aboriginal Relations and Land Use

The mandate of this branch is to foster mutually beneficial working relationships with First Nations communities. Team members act as facilitators between industry and First Nations communities. This branch is responsible for:

- informing First Nations communities about the oil and gas industry and its regulations;
- working with the Legislation, Policy and Special Projects Branch to create appropriate legislative and policy frameworks; and,
- representing the interests of the oil and gas sector in land use and environmental planning processes.

Applications and Approvals Branch

The Applications and Approvals Branch reviews applications related to oil and gas activities and pipelines. This branch approves those applications that serve the public interest concerning environmental, economic and social impacts.

Compliance and Enforcement Branch

This branch is responsible for ensuring that petroleum resources are developed, maintained, and transported in a safe, efficient and environmentally sound manner consistent with statutory requirements.

Corporate Services Branch

The mandate of the Corporate Services Branch is to provide prompt, effective and efficient financial services to Commission staff and clients, and to ensure the Commission's fiscal resources are used appropriately. This branch is also responsible for implementing various Commission plans and initiatives, such as the Environment Fund.

Engineering and Geology Branch

The responsibilities of this branch include:

- promoting conservation of British Columbia's oil and gas resources;
- public safety;
- protecting environmental and fiduciary interests;
- protecting the rights of tenure holders;
- maintaining and providing resource inventories, technical data and core access services to industry; and,
- providing technical support to the Applications and Approvals Branch.

Legislation, Policy and Special Projects Branch

The Legislation, Policy and Special Projects Branch is responsible for:

- coordinating legal reviews and changes to legislation;
- maintaining memoranda of understanding with other government agencies;
- developing policies for issues such as natural gas flaring and risk management; and,
- establishing a stakeholder, industry and legislation consultation framework.

The focus of this branch is to ensure that the Commission's long-term policies and legislation framework adapt and respond to new social, environmental and economic developments.

Stakeholder Relations and Communications Branch

This branch is responsible for developing public consultation policies and guidelines, and ensuring they are being followed by industry and interested parties.

Approvals

The following table summarizes the activities for which the Commission issues approvals.

Table 4-1: Activity Approvals Issued by the Commission

Category	Activity
Crown Land	Short-term (temporary occupation) and long-term (right-of-way and easement) tenure and leases on Crown land.
Geophysical	Geophysical licence; approval of geophysical exploration.
Oil	Wells, batteries, production facilities and tank farms.
Natural Gas	Wells; facilities such as processing plants, gas batteries, sulphur storage, etc.
Pipelines	Lines carrying oil, natural gas, fuel gas, oil well effluent, salt water, fresh water and natural gas liquids. Surface installations such as compressors, pump stations, headers, etc.
Roads	Petroleum development roads (layout and design).
Other Acts	Licences to cut (<i>Forest Act</i>); timber harvesting and field assessments ¹ ; archaeology permits (<i>Heritage Conservation Act</i>); non-special waste disposal and special waste storage and disposal (<i>Waste Management Act</i>); short-term use of water and changes in and about a stream (<i>Water Act</i>).
Public and Environmental Matters	Flares, abandonments, site cleanup and closures, emission reduction and prevention, plug-backs, waste and disposal

	schemes, public complaints, emergency response plans, setbacks from energy facilities, etc.
--	---

¹ Replaces logging plans.

4.1.3 Ministry of Energy and Mines

The Ministry of Energy and Mines manages the development of British Columbia's oil, gas, coalbed methane and geothermal resources, and implements policies and programs to encourage their economic development and maintain environmental integrity.

The MEM branches most closely linked to the oil and gas industry are:

- Aboriginal Relations Branch
- Environment and Land Use Branch
- Minerals, Oil and Gas Branch
- Oil and Gas Initiatives Branch
- Petroleum Lands Branch

Note: Most of the functions and staff of the Resource Revenue Branch, which was formerly in the Ministry of Energy and Mines, were transferred in June 2001 to the Ministry of Provincial Revenue.

4.1.4 Ministry of Water, Land and Air Protection

The Ministry of Water, Land and Air Protection (formerly part of the Ministry of Environment, Land and Parks) is responsible for environmental protection. It administers the following acts that may relate to upstream oil and gas activities. (Note that in Table 4-1, specified sections of several of these acts are administered by the Commission as they relate to oil and gas activities.)

- *Ecological Reserve Act*, R.S.B.C. 1996, c. 103
- *Fish Protection Act*, S.B.C. 1997, c. 21
- *Park Act*, R.S.B.C. 1996, c. 344
- *Waste Management Act*, R.S.B.C. 1996, c. 482
- *Wildlife Act*, R.S.B.C. 1996, c. 488

The Oil and Gas Waste Regulation (under the *Waste Management Act*) gives many operations the authority to discharge air emissions, a few specific liquid wastes and inert cuttings (*i.e.*, if they are not special waste and contain no more than 3 per cent oil), provided that conditions and registration requirements of the regulation are met.

4.1.5 Ministry of Sustainable Resource Management

The Ministry of Sustainable Resource Management brings together all information, planning and approval processes related to land use decisions under a

single portfolio. This ministry is responsible for administering the following acts that may relate to upstream oil and gas activities:

- *Agricultural Land Reserve Act*, S.B.C. 2000, c. 7
- *Environment Management Act*, R.S.B.C. 1996, c. 118
- *Environmental Assessment Act*, R.S.B.C. 1996, c. 119
- *Land Act*, R.S.B.C. 1996, c. 245
- *Land Reserve Commission Act*, S.B.C. 1999, c. 14
- *Muskwa-Kechika Management Area Act*, S.B.C. 1998, c. 38
- *Protected Areas of British Columbia Act*, S.B.C. 2000, c. 17
- *Water Act*, R.S.B.C. 1996, c. 483

The primary approvals that the upstream petroleum industry requires under the *Water Act* (*i.e.*, short-term use of water and changes in and about a stream) have been delegated to the Commission through the *Oil and Gas Commission Act*.

The general responsibilities of MSRM include Crown land policy, the Protected Areas Strategy (PAS), mapping and data management, and land and water use planning and zoning. Note in Table 4-1 that Crown land approvals required by the upstream petroleum industry under the *Land Act* (*i.e.*, short- and long-term tenure and leases) have been delegated to the Commission through the *Oil and Gas Commission Act*.

The following agencies are under the responsibility of MSRM:

- Archaeology Branch
- British Columbia Assessment Authority (BC Assessment)
- Environmental Assessment Office (EAO)
- Land and Water British Columbia (formerly BC Assets and Land Corporation)
- Land Reserve Commission (LRC)
- Muskwa-Kechika Advisory Board (MKAB)
- Resource Planning Division

The next few sections offer a brief description of each of the above branches.

Archaeology Branch

The Archaeology Branch provides programs designed to encourage and facilitate the protection, conservation and public appreciation of British Columbia's archaeological resources as mandated by the *Heritage Conservation Act*. Branch services are delivered through three program areas:

- Planning and Assessment administers a permit system under the Act, and provides archaeological input to the Province's integrated resource planning and environmental assessment initiatives.
- Negotiation Support provides support to treaty and non-treaty negotiations in areas related to heritage resource management.

- Inventory and Mapping maintains a publicly accessible series of registers for the recording of archaeological sites, heritage sites and objects, heritage wrecks and other related types of sites.

British Columbia Assessment Authority

BC Assessment operates as an independent Crown corporation governed by a Board of Directors. Its mandate is to establish and maintain uniform real property assessments throughout British Columbia, in accordance with the *Assessment Act*. The Act also requires that BC Assessment produce annual rolls, with assessments at market value.

Environmental Assessment Office

For information relating to the Environmental Assessment Office, (see Section 3.4, Environmental Impact Assessments)

Land Reserve Commission

The mandate of the LRC, an independent provincial agency, is to ensure that resource lands are available for British Columbia's working farms and forests. The LRC administers two reserves—the Agricultural Land Reserve (ALR) and the Forest Land Reserve.

The ALR comprises those lands within British Columbia that have the potential for agricultural production, and in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are controlled within the ALR. The ALR includes private and public lands that may be farmed, forested or left vacant. The *Agricultural Land Reserve Act* takes precedence over, but does not replace, other legislation and bylaws that may apply to the land. Local and regional governments, as well as other provincial agencies, are expected to plan in accordance with the provincial policy of preserving agricultural land.

Muskwa-Kechika Advisory Board

The Muskwa-Kechika Advisory Board (the Advisory Board) reports to the British Columbia government on the overall implementation of the Muskwa-Kechika Resource Management Plan. It also manages a trust fund to support special projects and planning initiatives within the Muskwa-Kechika. The Advisory Board does not have authority concerning the administration of the *Petroleum and Natural Gas Act* or the Forest Practices Code.

Resource Planning Division

The strategic planning functions from resource ministries and the Land Use Coordination Office (LUCO) were incorporated into the Resource Management Division of MSRM to support the development and approval of strategic land and water use plans.

LUCO was created to define a corporate vision for strategic land use planning in British Columbia and to oversee, coordinate, evaluate and report to Cabinet on the ministries' efforts to deliver the Provincial Land Use Strategy. Its mandate is to improve corporate direction and the coordination of all inter-ministry strategic land use planning initiatives. The Land Use Coordination Office oversees the development of various land use plans, including Land and Resource Management Plans (LRMPs).

4.1.6 Other Ministries

Regulatory agencies that may also play a role in environmental approvals for projects are listed below (along with the acts or responsibilities they oversee):

- Ministry of Agriculture, Food and Fisheries
 - Animal and crop protection
 - BC Soils Information Project
 - *Soil Conservation Act*, R.S.B.C. 1996, c. 434
- Ministry of Community, Aboriginal and Women's Services
 - *Fire Services Act*, R.S.B.C. 1996, c. 144
 - *Heritage Conservation Act*, R.S.B.C. 1996, c. 187
 - *Local Government Act*, R.S.B.C., c. 323 (was titled *Municipal Act*)
 - *Power Engineers and Boiler and Pressure Vessel Safety Act*, R.S.B.C. 1996, c. 368
- Ministry of Forests
 - *Forest Act*, R.S.B.C. 1996, c. 157
 - *Forest Practices Code of British Columbia Act*, R.S.B.C. 1996, c. 159
- Ministry of Health Services
 - *Health Act*, R.S.B.C. 1996, c. 179
 - Public and environmental health protection
- Ministry of Public Safety and Solicitor General
 - Emergency preparedness (Provincial Emergency Program—PEP)
- Ministry of Skills Development and Labour
 - Workers' Compensation Board
- Ministry of Transportation
 - Transportation of dangerous goods

4.1.7 Regional Districts and Municipalities

Local governments are concerned about upstream oil and gas activities (including aggregate extraction associated with these activities) that affect land use and result in zoning conflicts. This is especially true of sour gas developments where setbacks may apply to other types of developments around the sour gas facility. Regional districts and municipalities also assist the general public in dealing with industry impacts that affect them.

If zoning changes are required, which is normally the case for applications involving gas processing operations, a public hearing must be conducted.

Construction must not commence until the regional district completes the hearing and re-zoning processes.

4.2 Key Federal Regulatory Agencies

see also . . .

+ Section 4.3, Interjurisdictional Regulatory Issues

4.2.1 Introduction

The federal agencies described below hold responsibility for developing environmental policies and administering environmental legislation affecting British Columbia's oil and gas industry. For detailed summaries of specific legislation, see the *Environmental Regulatory Framework for the Upstream Petroleum Industry—Second Edition* (CAPP, October 1996).

4.2.2 Canadian Environmental Assessment Agency

The Canadian Environmental Assessment Agency promotes environmental assessment as a planning tool to protect and sustain a healthy environment. This agency, which administers the *Canadian Environmental Assessment Act*, reports directly to the Minister of the Environment and operates independently of all federal departments and agencies, including Environment Canada.

The *Canadian Environmental Assessment Act* requires that environmental assessments be conducted for federal projects, projects involving federal funding, projects on federal lands, and projects requiring a specific authorization or approval in accordance with certain provisions of federal acts listed in the Law List Regulations.

4.2.3 Department of Fisheries and Oceans

The federal Department of Fisheries and Oceans administers two acts that affect British Columbia's oil and gas operations.

Fisheries Act

Fisheries and Oceans Canada (DFO) is responsible under the federal *Fisheries Act* to protect fish and fish habitat in "waters frequented by fish." The Act contains provisions to:

- prohibit the killing of fish by means other than fishing (Section 32);
- prohibit the harmful alteration, disruption or destruction of fish habitat (Section 35[1]), unless authorized by the Minister (Section 35[2]);
- require unimpeded fish passage (Sections 22 and 26); and,
- prohibit the deposition of deleterious substances in waters frequented by fish (Section 36[3]).

By federal/provincial agreement, MWLAP is responsible for the management and protection of freshwater fish and anadromous fish stocks of steelhead, cut-throat trout, and Dolly Varden char. The federal agency retains administrative responsibility for the management and protection of fish habitat, marine fishes and Pacific salmon.

All crossings on fish streams that may result in a harmful alteration, disruption or destruction (HADD) of fish habitat will require an authorization from DFO under Section 35(2) of the *Fisheries Act*. All installations must be undertaken in a manner that strives to achieve the federal policy for the management of fish habitat conservation, restoration and development using the guiding principle of “no net loss.” Further information on the DFO policy of “no net loss” may be found in the document entitled *Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat*.

(Note that an authorization by DFO for a HADD of fish habitat will trigger an environmental review of the project under the *Canadian Environmental Assessment Act*.)

The Commission should be advised early in the application process if fish stream crossings are required. Depending on the location and type of structure, a more detailed referral may be required. Applications are not normally referred to DFO unless there is potential for a HADD.

Navigable Waters Protection Act

The *Navigable Waters Protection Act* requires that proponents obtain permits for any work to be built in, over, under or through navigable water.

The administrative definition for “navigable waterway” in the *Navigable Waters Protection Act Application Guide* is “any body of water capable of being navigated by any type of floating vessel for the purpose of transportation, commerce or recreation. This includes both inland and coastal waters. The authority to determine the navigability of a waterway rests with the Minister of Fisheries and Oceans or his/her designated representative.”

The *Navigable Waters Protection Act* prevents the creation of obstacles and obstructions in navigable waters, and prohibits the deposit of rubbish into navigable waters. The Canadian Coast Guard has jurisdiction over this Act.

4.2.4 Environment Canada

Environment Canada is the key federal environmental regulator. Legislation under the jurisdiction of Environment Canada includes the *Canadian Environmental Protection Act* and the *Migratory Birds Convention Act*. Environment Canada will also take a central role in administering the proposed *Species at Risk Act*.

Canadian Environmental Protection Act

Initiatives under the *Canadian Environmental Protection Act* include:

- eliminating the discharge of persistent toxic substances into the air, land or water;
- phasing out ozone-depleting substances;
- reducing sulphur dioxide emissions;
- movement of hazardous wastes;
- equivalency agreements between the federal government and provinces;
- an on-line registry of environmental information available to the public;
- whistle-blower protection; and,
- provisions for Canadians to sue polluters for damage to the environment, personal damage, and violations under the Act.

Lists of hazardous substances and associated regulations for managing hazardous substances are continually being updated under the *Canadian Environmental Protection Act*.

Migratory Birds Convention Act and the Proposed Species at Risk Act

The Canadian Wildlife Service handles wildlife matters that are the responsibility of the federal government. This includes the protection and management of migratory birds and nationally important wildlife habitat, endangered species, research on nationally important wildlife issues, control of international trade in endangered species, and international treaties. Wildlife management in Canada is shared by the federal, provincial and territorial governments.

The *Migratory Bird Convention Act* implements the 1916 treaty between Canada and the United States in which the two countries agree to adopt a coordinated system to protect migratory birds from indiscriminate harvesting and destruction. The Parksville Protocol, an amendment to the Convention, came into force on October 7, 1999. The Canadian Wildlife Service administers the *Migratory Bird Convention Act* and designated sanctuaries under it. The department will also be responsible for administering the *Species at Risk Act* once it is passed.

4.2.5 Human Resources Development Canada

The Labour Program of Human Resources Development Canada is responsible for enforcing the Workplace Hazardous Materials Information System (WHMIS) for federally regulated workers, while provincial health and safety departments are responsible for enforcing WHMIS for workers in their jurisdictions. While WHMIS is primarily designed to protect worker health, it also provides information that is useful in environmental programming. Specifically, material safety data sheets describe the properties and acceptable disposal methods for hazardous materials covered by WHMIS.

4.2.6 Indian Oil and Gas Canada

Indian Oil and Gas Canada is ultimately responsible for administering oil and gas rights on behalf of First Nations on reserve lands.

Note: There are ongoing negotiations to transfer the management and ownership of oil and gas rights on reserves from this department to the applicable First Nations.

Indian Oil and Gas Canada's legislative authority stems from the *Indian Oil and Gas Act* and the Indian Oil and Gas Regulations. The Regulations outline the requirements for permitting, surface lease requirements, and drilling and producing wells on Indian lands and those lands immediately adjacent to Indian lands. The department is legislated to require a project environmental assessment prior to issuing approval for oil and gas projects on reserve lands. It requires a minimum of 12 working days to screen an environmental assessment of a project in a non-sensitive location.

4.2.7 National Energy Board

The National Energy Board regulates:

- the construction and operation of interprovincial and international pipelines;
- the import and export of natural gas; and,
- the export of oil and electricity.

Pipelines wholly within British Columbia, with the exception of pipelines (including surface facilities) owned by Duke Energy Gas Transmission, are under the jurisdiction of the Commission and other provincial agencies, and are subject to provincial acts. Pipelines in the Duke Energy Gas Transmission system and pipelines constructed on federal lands (*e.g.*, First Nations reserve land and migratory bird sanctuaries) are subject to the *National Energy Board Act* and other applicable federal acts and their associated regulations.

The National Energy Board ensures that appropriate environmental assessments are conducted for projects under its jurisdiction. The Board also has the discretion to call for public hearings for pipeline construction projects that exceed 40 km in length.

4.2.8 Natural Resources Canada

Natural Resources Canada (NRCan) specializes in the sustainable development and use of natural resources, energy, minerals and metals, forests and earth sciences. NRCan is responsible for looking at issues, such as climate change, from both a national and international perspective. The responsibility for addressing climate change is shared with Environment Canada.

4.2.9 Transport Canada

Transport Canada is responsible for administering the *Transportation of Dangerous Goods Act, 1992*.

This Act specifies required practices for handling and transporting dangerous goods and for documenting and labeling containers. It also provides permits for allowing activities, such as the transporting of liquid sulphur without placards, under certain circumstances.

4.2.10 References

Canadian Coast Guard, March 1994. *Navigable Waters Protection Act Application Guide*.

Department of Fisheries and Oceans, 1994. *Habitat Conservation and Protection Guidelines*.

Department of Fisheries and Oceans, 1998. *Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat*.

Indian Oil and Gas Canada, 1995. *Information Letter 95-1: Implementation of the Canadian Environmental Assessment Act*.

4.3 Interjurisdictional Regulatory Issues

see also . . .

+ Section 4.1, Key British Columbia Regulatory Agencies

+ Section 4.2, Key Federal Regulatory Agencies

+ Section 4.5, Enforcement

4.3.1 Introduction

Environmental approvals issued by regulatory agencies commonly occur by means of interdepartmental or intergovernmental referrals. In this way, one agency can coordinate environmental approvals using input from other branches, divisions or departments. In British Columbia, the Commission acts as a “single window” for the review and approval of most applications under provincial environmental legislation (and other related legislation). The onus is on each proponent to comply with all governing jurisdictions.

4.3.2 Where Activities Cross Jurisdictional Boundaries

Where energy projects in British Columbia occur within the resource management, constitutional or administrative mandates of the federal government,

multiple environmental approvals may be required. This typically occurs when development projects involve First Nations reserves, navigable waters, fisheries resources or endangered species. Regardless of which federal agency is regulating the activity, they must all demonstrate an equivalent environmental review and approval process to that specified in the *Canadian Environmental Assessment Act*.

For pipelines crossing provincial or national borders, the National Energy Board assumes the lead responsibility for environmental regulation; however, under the jurisdiction of the *Canadian Environmental Assessment Act*, joint review panels for environmental approvals with provincial agencies may be established to avoid duplicate environmental reviews. As explained in (see Section 3.4, Environmental Impact Assessments), when a project in British Columbia triggers federal and provincial environmental assessment legislation, the governments have agreed to cooperate in a joint review. At the end of a joint review, each government makes a separate decision on the project.

4.4 Environmental Approvals and Applications

see also . . .

+ Section 3.4, Environmental Impact Assessments

4.4.1 Introduction

The Applications and Approvals Branch of the Commission reviews applications related to oil and gas activities and pipelines. This branch approves those applications that serve the public interest concerning environmental, economic and social impacts.

A summary of the Commission's approval processes by industry activity is provided below. For additional details, refer to Regulatory Concerns in the appropriate activity volume of these *Environmental Operating Practices*. Application forms and checklists can be found on the Commission website at <http://www.ogc.gov.bc.ca/formschecklists.asp>. The Commission is responsible for administering parts of the Oil and Gas Waste Regulation under the *Waste Management Act*; however, MWLAP has maintained responsibility for registrations and some other parts of the Regulation.

A key component of environmental approvals and applications is public involvement, which is not specifically addressed below. It is described briefly in each of the other volumes of these *Environmental Operating Practices*, and in greater detail in CAPP's *Guide for Effective Public Involvement* and the Commission's *Public Communication Guide for Upstream Oil and Gas Activities in British Columbia*.

4.4.2 Summary of Approvals Processes by Industry Activity

Geophysics—Regulatory Process

Any party proposing to conduct geophysical operations in British Columbia must apply to the Commission for a geophysical licence and an approval to conduct geophysical exploration. Supporting materials listed in the *Checklist for Geophysical on Crown Land* (or *Checklist for Geophysical on Private Land*) must also be submitted to the Commission to ensure the proposed program complies with First Nations, public, and legislative requirements. In order to conduct geophysical operations on private land, the company must obtain a permit from the owner or occupant.

If no ground disturbance is involved, the amount of supporting material is reduced substantially; however, a *Checklist for Aeromagnetic/Gravity/Geochem Surveys* must be submitted to ensure that First Nations and the public have been informed of the proposal.

If a program is to be conducted in the ALR in northeastern British Columbia (*i.e.*, Peace River and Northern Rockies regional districts), a separate application to the LRC is not required, provided the program complies with “General Order 293/95, Oil and Gas Exploration, Well Sites and Pipelines in the Agricultural Land Reserve”.

Drilling—Regulatory Process

Prior to constructing a wellsite and temporary access road, a company drilling a well on Crown land must obtain an approval under Section 7, Entry on Crown Land, of the *Petroleum and Natural Gas Act*, from the Commission. If a permanent petroleum road is to be constructed, a permit from the Commission under Section 14, Temporary Occupation of Crown Land, of the *Land Act*, is required.

In order to obtain a surface lease on private land, the company must enter into an agreement with the owner or occupant. If an agreement cannot be reached, either party can contact the MEM Mediation and Arbitration Board. Once lease agreement has been achieved, proof of this is required before the Commission can issue approval to construct a lease.

Any company wanting to drill a well for the purpose of producing hydrocarbons must first obtain a *Well Authorization and Permission to Construct a Wellsite and Access* from the Commission. A checklist for a wellsite on Crown or private land (or on an agricultural lease) must accompany the application to enable the Commission to monitor activities and to ensure that the proposed wellsite and drilling program comply with all regulatory requirements.

If a well is to be drilled in the ALR in northeastern British Columbia (*i.e.*, Peace River and Northern Rockies regional districts), a separate application to the LRC is

not required, provided the program complies with “General Order 293/95, Oil and Gas Exploration, Well Sites and Pipelines in the Agricultural Land Reserve”.

The Commission is the primary agency that regulates the disposal of gel-chemical mud system wastes. In some circumstances, MWLAP may also become involved although this Ministry is the primary agency involved in the disposal of oil-based and other mud system wastes. Inert treatment is now handled by MWLAP under the Special Waste Regulation. Approval from the LRC is also required if oil-based mud is to be disposed of by land treating off-site and within the ALR.

Production Facilities and Pipelines—Regulatory Process

Prior to undertaking any facility or pipeline construction on Crown land, a company must first apply to the Commission for short-term tenure (*i.e.*, temporary occupation) and long-term tenure (*i.e.*, right-of-way and easement) under Section 14 and Section 40 of the *Land Act*. A statutory right-of-way is the standard long-term tenure for wellsites and production facilities as well for as linear activities, including pipelines and electrical transmission, distribution, transit or feeder lines on Crown land. In the case of gas processing plants, the required long-term tenure is a lease.

In order to obtain a surface lease on private land, the company must enter into an agreement with the owner or occupant. If an agreement cannot be reached, either party can contact the MEM Mediation and Arbitration Board. Once lease agreement has been achieved, proof of this is required before the Commission can issue approval to construct a lease.

The Ministry of Water, Land and Air Protection is the primary agency that regulates the discharge of waste from facilities. The Oil and Gas Waste Regulation (under the *Waste Management Act*) gives many operations the authority to discharge air emissions and a few other specific wastes, provided that conditions and registration requirements of the regulation are met.

Production Facilities

Any company wanting to construct a production facility in British Columbia must submit the following to the Commission:

- a Facilities Engineering & Technical Review Package (including an Application for Production Facility and an Application for Well or Facility to Facility Linkage, under the Petroleum and Natural Gas Act); and,
- a Pipeline and Facility Engineering & Technical Review Package (including, if applicable, a PL 103—Compressor/Pump Station, Interim, under the Pipeline Act).

A checklist for on-lease or off-lease facilities on Crown or private land must accompany the applications to allow the Commission to make sure the proposed facility complies with all regulatory requirements. These checklists include an

application to the LRC if the proposed facility is off-lease and is to be located in the ALR. Some facilities also require registration under the Oil and Gas Waste Regulation.

Gas Processing Plants and Sulphur Handling Facilities

Natural gas processing plants, including deep cut plants and sulphur handling facilities, require approvals under the *Petroleum and Natural Gas Act* (Section 100, Approval of Schemes) and the *Pipeline Act*. Processing plants require registration under the Oil and Gas Waste Regulation or permits under the *Waste Management Act* to discharge any wastes.

Pipelines

Any company wanting to construct a pipeline fully within British Columbia must submit a *Pipeline and Facility Engineering & Technical Review Package* and a *Facilities Engineering & Technical Review Package* to the Commission. A checklist for pipelines on Crown or private land must accompany the applications to allow the Commission to make sure that the proposed pipeline complies with all regulatory requirements. If the pipeline is to be located in the ALR and is to be 5 km or more, or is outside northeastern British Columbia (*i.e.*, Peace River and Northern Rockies regional districts), an application for approval under the *Agricultural Land Reserve Act* must be submitted to the LRC.

Table 4-2 summarizes the various approvals under the *Pipeline Act*. For additional details, refer to the *Pipeline and Facilities Application Guide*, available on the Commission website at <http://www.ogc.gov.bc.ca/pipelines.asp>.

Table 4-2: Summary for Certificates, Leave and Permission Under the Pipeline Act

Situation ¹	Requirements	Signed by
Companies applying for the first time in BC	Certificate pursuant to Section 2 of the <i>Pipeline Act</i> .	Chief Inspecting Engineer (CIE)
Companies in possession of a Section 2 but applying in a Field new to them	Certificate pursuant to Section 10 of the <i>Pipeline Act</i> .	CIE
Companies in possession of a Section 10 wishing to construct in the same Field	Submit 3 copies of the application to the CIE. No new certificate required, but a number will be annexed onto the original certificate number. Will be assigned a project number.	CIE
Companies in possession of Section 10 wishing to alter, add to, or extend a pipeline	Application pursuant to Section 22(1) of the <i>Pipeline Act</i> is required. Submit 3 copies of the application to the CIE pursuant to the Pipeline	CIE

(or a line connected to it) that does not exceed 40 km in length	Regulation. The application will be assigned a project number and a certificate number, and a letter will be issued indicating acceptance of the application for filing. The letter may contain conditions of acceptance.	
Companies in possession of a Section 10 wishing to construct an addition or extension to a pipeline (or a line connected to it) that exceeds 40 km in length	Authorization pursuant to Section 22(2) of the <i>Pipeline Act</i> is required. Submit 3 copies of the application to the CIE pursuant to the <i>Pipeline Act</i> . A project number and a certificate number will be issued.	CIE
Transferring, selling, leasing out, change of name or change of operator	Leave pursuant to Section 32 of the <i>Pipeline Act</i> .	CIE
Abandonment	Leave to Abandon pursuant to Section 9 of the <i>Pipeline Act</i> .	CIE
Leave to Open	All projects—Section 36	CIE
On completion of a project... Certificate of Operation	After Leave to Open and PL 102 or 104 are submitted and fees pursuant to Pipeline Regulation are paid, a Certificate of Operation is issued.	CIE and Senior Pipeline Inspector

¹ A company operating in British Columbia must be registered with the Corporate Registry, Ministry of Finance.

Reviewable Projects (*Environmental Assessment Act*)

A natural gas processing plant designed to process $5.634 \times 10^6 \text{ m}^3$ (200 Mmscf) or more of natural gas per day, and/or to emit 2 t or more of sulphur per day to the atmosphere, is considered a “reviewable project” under the Reviewable Projects Regulation of the *Environmental Assessment Act*. If a new transmission pipeline (as defined under the Regulation) or a modification to an existing transmission pipeline has the following diameter length dimensions

- ≤ 114.3 mm, 60 km or more
- > 114.3 and ≤ 323.9 mm, 50 km or more
- > 323.9 mm, 40 km or more,

it is also considered a “reviewable project” under the *Environmental Assessment Act*. Detailed information on the review process for these facilities can be found in the *Guide to the British Columbia Environmental Assessment Process*. The review process is also discussed in (see Section 3.4, Environmental Impact Assessments).

Note: A project reviewed under the *Environmental Assessment Act* must still obtain applicable approvals under the *Petroleum and Natural Gas Act*, the

Pipeline Act and the *Waste Management Act*. A sulphur handling facility associated with a plant that is a reviewable project will be reviewed with the plant under the *Environmental Assessment Act*.

4.4.3 References

Canadian Association of Petroleum Producers, December 1997. *Guide for Effective Public Involvement*. Pub. No.1997-0005.

This guide, along with an interactive CD (Pub. No. 1997-0017), is a comprehensive how-to book that has been developed by experts in public involvement and is designed to help company employees become practitioners in public involvement. This guide and CD will help individuals improve their understanding of public concerns, respond effectively to them, and develop positive community relations. In addition, this guide will allow individuals to access effective public involvement principles, tips, protocols, success stories and business tools.

Oil and Gas Commission, September 18, 2001. *Public Communication Guide for Upstream Oil and Gas Activities in British Columbia (Draft)*.

This document was prepared for consultation purposes between the Commission, its clients and stakeholders. It includes public communication and application requirements and communications process information.

4.5 Enforcement

see also . . .

+ Section 4.1, Key British Columbia Regulatory Agencies

+ Section 4.2, Key Federal Regulatory Agencies

4.5.1 Introduction

The enforcement of regulatory requirements for the Oil and Gas Commission, the Ministry of Forests and the Ministry of Water, Land and Air Protection is described below. Note that other provincial agencies, as well as federal agencies, have their own enforcement provisions.

4.5.2 Oil and Gas Commission

The Commission believes that enforcement is one part of a total program of effective regulation designed to achieve an upstream oil and gas industry that understands, respects, and meets or exceeds regulations and standards, often through the implementation of self-imposed guidelines. The Commission's enforcement principles include the following:

- all enforcement actions for non-compliance are timely, transparent, effective, and appropriate for the severity of the situation;
- any repeated or similar non-compliance results in escalating enforcement consequences; and,
- any non-compliance that poses an immediate and severe threat to workers, the public or the environment will be taken care of on a timely basis in an effective manner.

Regulatory Delivery Model

The Compliance and Enforcement Branch of the Commission is developing a new compliance and enforcement regulatory delivery model over the next few years that will require industry to be more self-reliant and accountable for regulatory compliance. The new model will allow the Commission to respond to escalating levels of activity and focus on the following inspection priorities:

- public safety, including public complaints that are health or safety related;
- environmental protection;
- community relations/other public complaints; and,
- operator rights/responsibilities.

For details on the proposed model, refer to the Commission’s discussion paper “Compliance and Enforcement Regulatory Delivery”, February 28, 2000, the “Summary of Recommendations—Compliance and Enforcement Discussion Paper”, January 2001, and other materials posted on the Commission’s website at <http://www.ogc.gov.bc.ca/complianceandenforcement.asp>.

Statutory Provisions

The specific provisions that establish the authority for the Commission to conduct compliance inspections and undertake enforcement actions include:

Petroleum and Natural Gas Act

- Section 104, Access and Inspection
 - provides an officer of the Commission with access and inspection powers.
- Section 106, Enforcement of Orders and Costs
 - provides for enforcement orders and cost recovery.
- Section 109, Further Powers of Minister for Enforcement
 - allows for entry, seizure and taking control of a well and any, or all, associated property.
- Section 104 (Drilling and Production Regulation), Compliance With This Regulation
 - allows an authorized Commission employee to issue an order. The recipient of the order must comply.

Pipeline Act

- Section 4, Powers of Inspector

- empowers a designated Commission employee to enforce the Act.

Current Enforcement Tools

The enforcement tools currently used by the Commission include the following:

- Bonding (from Section 18, Bonding, of the Geophysical Exploration Regulation)
 - a performance bond up to \$100 000 may be ordered.
- Warnings
 - often used for minor infractions; specifies the action to be taken and the time when the action is to be completed;
 - a follow-up inspection may or may not occur;
 - used at two levels:
 - 1) local office (inspectors first try to resolve issues locally)
 - 2) corporate headquarters (involved if a local response is not satisfactory or timely, or if the problem is widespread)
- Shutdown/Shut-in Orders
 - may be used if the response to warnings is unsatisfactory or if there is an immediate threat to health, safety or the environment;
 - an order is not removed until the condition that caused the shutdown/shut-in is rectified;
 - follow-up inspections are conducted to confirm that action has been taken.
- Penalties
 - Section 134, Offence and Penalty, of the *Petroleum and Natural Gas Act*
 - upon conviction, a fine between \$500 and \$5000;
 - each day in contravention constitutes a new offence;
 - an officer, director or agent of the corporation may be personally liable; and,
 - imprisonment of up to two years.
 - Section 34, Penalties, of the *Pipeline Act*
 - upon conviction, a fine up to \$1000; and,
 - fines up to \$500 per day if the offence is of a continuing nature.
- Cancellation
 - Section 86, Cancellation (Well Authorization), of the *Petroleum and Natural Gas Act* allows for the cancellation of a well authorization.
 - Section 135, Cancellation (Regulations and Penalties), of the *Petroleum and Natural Gas Act* allows for the cancellation of a permit, licence, or lease if the holder fails to comply with the provisions of the Act.
 - Section 33, Commission May Rescind Certificate, of the *Pipeline Act* permits cancellation of a certificate authorizing the construction of a pipeline.

In addition to these enforcement tools, other ministries have penalty and offence provisions that may be applied if a company contravenes legislation and causes environmental damage. For example, the Forest Practices Code and the *Waste Management Act* have provisions for fines up to \$1,000,000 and imprisonment.

The following sections provide information on the enforcement tools used by MOF and MWLAP. For complete details, refer to documents posted on the Commission's website at <http://www.ogc.gov.bc.ca/complianceand enforcement.asp>.

4.5.3 Ministry of Forests

Compliance

Compliance actions are used in instances of minor non-compliance (*i.e.*, trivial non-compliance defined as being “trifling in nature”, or “not in the public interest to pursue”). They include:

- Compliance Notice—a written notice advising a licensee of the section contravened and providing advice and a timeline for achieving compliance;
- Warning Ticket—similar to a Violation Ticket (see Section 4.5, Enforcement), but carrying no monetary fine; and,
- No Action.

Enforcement

Enforcement actions are used in instances of significant non-compliance (*i.e.*, significant non-compliance, defined as anything greater than trivial).

Enforcement actions include:

- no action;
- stopwork order;
- timber seizure/forfeiture;
- violation ticket;
- soil rehabilitation order;
- Section 45 (Forest and Range Tenure Agreements, Forest Practices Code) rehabilitation order;
- Section 118 (Compliance and Enforcement, Forest Practices Code) rehabilitation order;
- monetary penalty;
- refusal of a cutting permit;
- suspension of a cutting permit;
- cancellation of a cutting permit;
- prosecution under the Forest Practices Code, the *Forest Act* or the *Range Act*; and,
- prosecution under the Criminal Code of Canada.

For additional information, refer to the MOF Compliance and Enforcement Branch's website at <http://www.for.gov.bc.ca/enforce/index.htm>.

4.5.4 Ministry of Water, Land and Air Protection

The Ministry of Water, Land and Air Protection's Enforcement Program provides direction and policy and procedural guidance to the Conservation Officer Service (COS), which is the delivery arm of the program. The program also supports other ministry programs in the development of new legislative initiatives or amendments to existing regimes to ensure the enforceability of new environmental protection laws. It also participates in interagency and intergovernmental discussions concerning partnership and joint enforcement efforts.

The program's Special Investigations Unit (SIU) conducts investigations and lays charges for violations that may not be achievable by COS uniformed staff. The SIU objective is to focus on illegal activities that have the greatest impact on the environment, fish, wildlife, forest and water resources.

Summaries of charges and penalties, and instructions for reporting violations of federal and provincial environmental legislation, can be found on the program's website located at <http://wlapwww.gov.bc.ca/eeeb/enfhome/index.htm>.

4.6 Government Initiatives for Environmentally Significant Issues

see also . . .

+ Section 4.4, Environmental Approvals and Applications

4.6.1 Introduction

Various departments of the federal and British Columbia governments have implemented specific initiatives aimed at addressing issues and areas that are environmentally significant. The following sections describe major provincial initiatives that affect upstream petroleum industry activities. For more details, refer to Section 3, Planning Framework, of the *British Columbia Oil and Gas Handbook*, and the applicable ministry websites.

4.6.2 Land Use Planning

Ninety four percent of the land in British Columbia is publicly-owned Crown land managed by the provincial government. This high level of public land ownership gives the Province a broad base on which to achieve long-term goals. The various provincial land use initiatives are intended to ensure a sustainable future for British Columbia's environment, economy and communities.

Land use planning is undertaken by planning teams, working in partnership with government representatives who provide support as well as technical information. Planning teams select new protected areas and recommend land use zones for the remainder of the Crown land base. Work is done in open, public forums.

Participants include:

- First Nations;
- municipal and local governments;
- forestry, oil and gas, agriculture and labour representatives;
- the business sector;
- environmental, tourism and recreation representatives; and,
- special interest groups.

Five regional plans have been completed for the following areas:

- Vancouver Island;
- Caribou-Chilcotin;
- West Kootenay-Boundary;
- East Kootenay; and,
- Lower Mainland.

Strategic planning is now focused at the sub-regional level, with 18 identified sub-regional land and resource management planning areas. Strategic land use planning focuses on land use allocation and establishing management objectives for the planning areas. Land and resource management plans (LRMPs) are described below.

The Resource Planning Division of MSRM coordinates the Province's role in land use decision-making by supporting or carrying out the following:

- completing priority strategic plans;
- providing policy direction for strategic land use planning;
- developing tools to assist in implementing the direction outlined in land use plans;
- monitoring, evaluating and revising land use plans;
- mapping and managing resource information;
- responding to current/emerging issues; and,
- managing multi-million dollar funding for public participation in land use planning and special projects.

Land and Resource Management Plans

Land and Resource Management Plans are the sub-regional components of the integrated planning framework in British Columbia. They establish direction for land use and specify broad resource management objectives. These plans also provide a comprehensive management framework to guide resource development and more detailed, lower level planning. The scale of these plans is large enough to deal with strategic issues spanning multiple watersheds, while also addressing local community issues.

Approved LRMPs provide strategic direction for land allocation processes by:

- establishing resource management zones and resource management objectives;
- defining protected area boundaries;

- outlining the primary requirements for resource management that will meet conservation goals for biodiversity, fish, wildlife and other resources; and,
- defining resource management objectives that provide direction to lower level operation planning in conjunction with the Forest Practices Code.

In addition to protected areas, other resource management zones established under LRMPs include zones for:

- enhanced resource development (*e.g.*, to manage land for oil and gas, mineral and timber resources);
- general resource development (*i.e.*, for a wide array of integrated resource values);
- special management, where resource extraction and development is allowed provided it respects sensitive environmental values such as habitat, recreation or community watersheds that were given priority in local land use plans; and,
- wildland zones, where no logging is allowed but oil and gas exploration is permitted.

Note: Wildland zones are only used in the Mackenzie LRMP.

Protected Areas

British Columbia's system of protected areas includes land as well as freshwater. It currently protects 12.95 percent of British Columbia through the approval of completed land use plans, which now cover 73 percent of the Province. A separate marine protected areas strategy is being developed in cooperation with the federal government.

The land and resources in protected areas may not be sold, with the exception of oil and gas rights in several protected areas in the northeast, where directional drilling without surface access is permitted. Mining, logging, hydro dams and oil and gas development are typically not permitted in Parks. These areas are set aside as nature preserves, scientific research areas, and places for education, appreciation and recreational activities. Protected areas do not limit First Nations' rights and treaty negotiations.

The Protected Areas Strategy (PAS), which provides the basis for land allocation recommendations to Cabinet, has two goals. The first is to protect viable, representative examples of natural diversity in the Province that are representative of the major terrestrial, marine and freshwater ecosystems, the characteristic habitats, hydrology and landforms, and the characteristic backcountry recreational and cultural heritage values of each ecosystem.

The second goal is to protect the special natural, cultural, heritage and recreational features of the Province (including rare and endangered species and critical habitats; outstanding or unique botanical, zoological, geological and paleontological features; outstanding or fragile cultural heritage features; and unique outdoor recreational features such as trails).

Special Management Zones

Special Management Zones (SMZs) are land use planning areas where the conservation of one or more resource values (*i.e.*, wildlife habitat, recreation or community watersheds) are recognized as one of the values to be emphasized in resource management decisions. These zones can act as a signal to resource developers that there are special or sensitive resource values present in the area that will have to be addressed in their development plans. These zones do not impose any new regulations on exploration and development activities that are not applicable elsewhere in the Province, with the exception of the Muskwa-Kechika area of north central British Columbia.

Muskwa-Kechika Management Area

Found in northeastern British Columbia, where the extensive boreal plains and muskeg of the east meet the mountains to the west, the 6.4 million-hectare Muskwa-Kechika area remains one of North America's last true wilderness spots south of the 60th parallel. Rich in untouched beauty, natural resources and abundant animal life, the Muskwa-Kechika Management Area has national, international and global significance for its abundance of diverse resources.

The management plan for the Muskwa-Kechika area balances resource management with conservation. More than one million hectares are permanently protected through 11 protected areas. These areas are surrounded by more than three million hectares of special management zones where wilderness and wildlife habitat will be maintained over time and resource development such as logging, mineral exploration and mining, and oil and gas exploration and development will be allowed in a way that is sensitive to wildlife and environmental values.

Oil and Gas Exploration and Development in the Muskwa-Kechika

The following information, based in part on the brochure *Oil and Gas Exploration and Development in the Muskwa-Kechika*, lists the activities that may be conducted in the management area. Note that oil and gas exploration and development is prohibited in all protected areas within the Muskwa-Kechika area. For additional information on pre-tenure planning, see the MEM website at <http://www.gov.bc.ca/em/>. Information on the Muskwa-Kechika can be found on the Ministry of Sustainable Resource Management's (Resource Management Division) website at <http://www.gov.bc.ca/srm/>.

Tenures

New tenures will not be issued without a pre-tenure plan as defined by the *Memorandum of Understanding Respecting Operational Land Use Planning for Oil and Gas Activity in Northeast BC*. Requests for new tenures will be accepted and used to prioritize the development of pre-tenure plans.

A pre-tenure plan for the Upper Sikanni River area has been developed and a plan for the Besa Prophet River area is nearing completion. Requests for new tenures within completed plans will be accepted.

Existing tenures within the Muskwa-Kechika area will be grandparented with all rights and privileges that existed prior to the designation of the Muskwa-Kechika area. (This does not include tenure within the Upper Sikanni Management Plan that must conform to the requirements of that plan.)

Geophysical Exploration

Geophysical exploration is permitted within the Muskwa-Kechika area without the requirement of preparing a pre-tenure plan. Standard approval and permitting processes apply. Projects must be consistent with the objectives of the Muskwa-Kechika Resource Management Plan.

Geophysical exploration within the Upper Sikanni Management Plan must conform to that plan.

Access Development

Road access to existing grandparented tenures, outside the Upper Sikanni Management Plan and through unroaded areas, will be subject to review and approval under established procedures and applicable legislation. Road access to all other tenures must be consistent with pre-tenure plans.

Wildlife, Fish and Recreation

Oil and gas exploration and development in the Muskwa-Kechika area is subject to provincial guidelines and standards and will be carried out in a manner that respects sensitive natural values. The long-term objective is to return the lands to their natural state as much as possible after development is completed.

4.6.3 Forest Practices Code

The *Forest Practices Code of British Columbia Act* promotes sustainable forest use that includes:

- managing forests to meet present needs without compromising the needs of future generations;
- providing stewardship of forests based on an ethic of respect for the land;
- balancing economic, productive, spiritual, ecological and recreational values of forests in order to meet the economic, social and cultural needs of people and communities, including First Nations;
- conserving biological diversity, soil, water, fish, wildlife, scenic diversity and other forest resources; and,
- restoring damaged ecologies.

Strategic plans under the Forest Practices Code do not apply to projects approved under the *Petroleum and Natural Gas Act* or the *Pipeline Act*. Logging plans are the only Code operational plans that may apply to these projects (*i.e.*, if required by the Commission for specific projects). Commencing January 1, 2002, the *Timber Harvesting and Field Assessment* replaces the logging plan form for most applications.

The focus of the Forest Practices Code is moving away from a “prescriptive” planning process to a “results-based” regulatory system. The upstream oil and gas industry will continue to be regulated under the Code through the Timber Harvesting Practices Regulation and certain portions of the Forest Road Regulation (*i.e.*, all of the sections except layout and design, which is covered under the *Petroleum and Natural Gas Act*).

Note: At the time of publication of these *Environmental Operating Practices*, the Forest Practices Code was under review as part of the British Columbia Government’s internal review of all regulatory requirements.

4.6.4 Climate Change

Canadian Association of Petroleum Producers

Climate change has been accepted as a significant environmental issue at both national and international levels. In February 1997, the CAPP Board of Governors approved a three-year action plan to guide the Canadian upstream petroleum industry in supporting the federal Climate Change Voluntary Challenge and Registry Program, which challenges Canadian organizations to voluntarily take actions to limit or reduce emissions of greenhouse gases. For more information, refer to CAPP’s *Global Climate Change Voluntary Challenge Guide*.

CAPP is working closely with stakeholders, including federal and provincial governments, to develop policy solutions that address potential climate change and cost-effective areas for industry best practices, including:

- emissions measurement and reduction;
- information-sharing on research, development and demonstration initiatives to reduce energy and the carbon intensity of oil and gas activities;
- fuels for the future; and,
- opportunities to develop partnerships between the auto industry and the oil and gas industry.

In response to the federal and provincial governments’ request to the upstream oil and natural gas industry for assistance in analyzing the potential impact of the Kyoto Protocol and developing a national strategy for responding to climate change, CAPP developed the September 1999 “Upstream Oil and Gas Industry Options Paper, Report of the Upstream Oil and Gas Working Group of The Industry Issues Table to The National Climate Change Secretariat”.

Government Strategies

The Air Resources Branch of MWLAP is responsible for addressing air quality issues affecting British Columbia. The branch, along with officials from MEM, represents the Province in forums addressing global climate change, including the National Climate Change Process (NCCP).

The NCCP was established by energy and environment ministers in 1998. It is advanced through the collaborative efforts of officials from the federal, provincial and territorial governments. A national committee called the National Air Issues Coordinating Committee—Climate Change (NAICC-CC) is responsible for engaging governments and stakeholders in the development of a National Implementation Strategy, and advising ministers regarding:

- the impacts, costs and benefits of the Kyoto Protocol's implementation and of the various options open to Canada;
- preparation for the continuing international negotiations on elements of the Kyoto Protocol that require further development;
- the development of immediate actions that can be taken to provide early reductions in greenhouse gas emissions; and,
- the development of longer-term actions that will provide sustained reductions in emissions.

The National Implementation Strategy is a framework for a coordinated Canadian response to climate change. It is acknowledged that while climate change poses significant environmental, economic, health and social risks for Canadians, many uncertainties remain. The Strategy uses a risk-management approach to apply what is already known about the causes and impacts of climate change, while positioning Canada to make the right decisions as more information becomes available and uncertainties are reduced.

The Strategy identifies different phases of progressive action based on decisions and assessments from domestic and international developments. Thus, Phase One of the Strategy takes place from now until a decision is made on ratification of the Kyoto Protocol, or another treaty. Phase One supports actions that are cost-effective, deliver important ancillary health, economic and environmental benefits, and lay a foundation for more progressive actions. Future phases will depend on decisions about the Canadian response to climate change and the nature of international commitments.

On October 16, 2000, the British Columbia government released a three-year Climate Change Business Plan containing detailed commitments in key areas (including transportation, energy and industry, communities and buildings, forests and agriculture) and other supporting actions. It is intended to manage the risk and uncertainty of climate change by adopting low-cost actions that deliver additional environmental, health and economic benefits; therefore, it fits within Phase One of the National Implementation Strategy, covering the period until an international treaty (the Kyoto Protocol or its successor) is ratified.

Note: At the time of publication of these *Environmental Operating Practices*, this plan and other associated programs were under review.

4.6.5 Coalbed Methane

Coalbed methane (CBM) potential is present in many areas throughout British Columbia, including parts of Vancouver Island and the interior, northeastern area and southeast corner of the Province. While yet to be developed, CBM could become a significant energy resource for British Columbia. A goal of MEM is to create an environment that will encourage responsible CBM development and ensure that the Province has a more diverse energy supply for the future.

Since CBM is a clean-burning fuel and considered more environmentally friendly than oil, coal or even conventional natural gas, it requires minimal processing to remove trace amounts of water and CO₂. To minimize land use, companies are encouraged to use existing trails and logging roads wherever possible for the potentially high number of wells and extensive infrastructure required for CBM operations.

Water production and disposal is a key issue in CBM development. De-pressuring the coal seam can generate large volumes of water of varying quality. The Oil and Gas Waste Regulation and the Drilling and Production Regulation require that produced water be disposed of in an underground formation, unless otherwise permitted. Testing of the produced water will determine the most appropriate disposal method, giving consideration to disposal costs and the protection of drinking water sources, fish habitat and local vegetation.

Surface Discharge of Water

In the United States, water quality testing indicates that CBM-produced water is generally of good quality (*i.e.*, low total dissolved solids and chlorides). After rigorous testing, water that meets quality standards may be permitted to flow into surface drainage or ponds, seep back into the soil, or evaporate naturally. The Commission, in consultation with MWLAP, will review surface discharge options on a case-by-case basis.

Note: The actual authority for water disposal rests first with the *Waste Management Act* and the Oil and Gas Waste Regulation. The Regulation authorizes produced water disposal in accordance with the Drilling and Production Regulation.

Subsurface Water Injection

When the composition or volume of the produced water makes surface disposal inappropriate, the Commission will require the operator to inject produced water into a suitable underground formation. Water that tests high in total dissolved solids (including salts) will fall into this category.

4.6.6 References

For additional information on these environmentally significant issues, visit the websites of the various agencies and organizations mentioned in this section.

Canadian Association of Petroleum Producers, June 2000. *Global Climate Change Voluntary Challenge Guide*. Pub. No.2000-0004.

This guide presents methods of calculating greenhouse gas emissions and offers guidelines for producing a high quality, comprehensive action plan unique to a company's circumstances.

Government of Canada, October 2000. *A Compendium of Canadian Initiatives—Taking Action on Climate Change*.

Ministry of Energy and Mines, 2001. *Coalbed Methane in British Columbia*.

Ministry of Energy and Mines and Ministry of Water, Land and Air Protection, October 2000. *British Columbia Climate Change Business Plan 2000/01—2002/03*.

Oil and Gas Commission, February 1997. *British Columbia Oil and Gas Handbook*. Section 3, Planning Framework.

Appendix A Definitions

A.1 Definitions

The following definitions are intended for use with these practices. Where there are discrepancies between these definitions and legislated definitions or provincial guideline definitions, the legislated definitions or provincial guideline definitions will apply.

For additional definitions, see Section 15, Glossary, of the British Columbia Oil and Gas Handbook and other British Columbia Government publications.

Abandonment:

Dismantling a licensed facility to make it incapable of its Commission-authorized use. This includes removing equipment, structures and appurtenances, all produced liquids, and removing or landfilling the base pad, structural concrete and surfacing materials. In addition, it includes leaving downhole subsurface structures in a permanently safe and stable condition in accordance with Commission requirements.

Aboveground Storage Tank (AST):

A tank that sits on or above the ground surface. The top and complete external sides can be visually inspected.

Access:

Depending on the context, refers to either the:

- physical infrastructure or linear disturbances (*e.g.*, roads, seismic lines and rights-of-way) that act as travel corridors for recreational and industrial users;
- use of existing travel corridors by recreational and industrial users; or,
- right of recreational and industrial users to use land.

Note: Other definitions are available but they vary within British Columbia (*e.g.*, for different LRMPs).

Adverse Effect:

An impairment of, or damage to, the environment, human health or safety, or property.

Air Dispersion Model:

A mathematical description of predicted relative parameter concentrations resulting from effluent from either a single source or multiple sources. The model takes into account such factors as buoyancy of the effluent plume, prevalent meteorological conditions, and topographical features. Dispersion modeling is useful for determining the height and siting requirements for stacks, as well as for predicting the location(s) of expected maximum ground effluent concentrations during the selection of air monitoring sites.

Air Monitoring:

Measurement of air quality, involving the:

- collection of air samples;
- analysis of certain parameters of the samples related to air quality; and,
- comparison of the results to a specific standard or criterion for each parameter.

Ambient Air Monitoring:

Measurement of air quality surrounding a facility. Parameter concentrations are the result of several contributing factors, such as the number and proximity of point source emissions, meteorological conditions, and naturally occurring (background) concentrations.

Baffle Configuration:

Configuration of obstructions (baffles) designed to decrease water velocity through a culvert and ease fish passage.

Blowout:

Uncontrolled flow of gas, oil or other well fluids from a well during drilling, occurs when formation pressure exceeds the pressure exerted by the column of drilling mud.

Blowout Preventer (BOP):

Hydraulically or mechanically actuated high-pressure valve installed at the wellhead to control pressure within the well.

Bridging:

The suspension of pipelines across a channel, or the hanging of pipeline from the underside of an existing bridge where structural constraints of the bridge allow.

Bulk Pad:

Ground surface area designated for the segregated storage of materials without the use of a container or tank.

Cased-hole Abandonment:

The downhole and surface abandonment of a completed or cased well.

Cathodic Protection:

The application of direct current to metals via an external power source or galvanic anodes to replace the electrons lost as metal corrodes. This process supplies electrons to protect the metal structure.

Cleanup:

Removal of unwanted debris (*e.g.*, stakes, bone yard material, rocks) from a site.

Compaction:

Reduction of pore spaces between soil and rock particles resulting in a hardening of the soil layer. This process reduces root penetration, soil aeration and water infiltration, thereby leading to difficulties in cultivation and seedbed preparation, and increased surface water runoff.

Contaminated Site:

See *Risk Assessments and Risk Management* in the Overview and Resources volume of these Operating Practices for the definition of “contaminated site” in British Columbia.

Container:

Any portable aboveground containment device (*e.g.*, drums, pails, bags, boxes, totes) with a capacity not exceeding 1 m³. This device can contain liquids (*e.g.*, chemicals, oily waste) or solids (*e.g.*, used/oily filters, absorbent pads and rags, oily sand or sawdust).

Contingency Plan:

A plan that is used to minimize the effects of possible but unpredictable events such as an oil spill.

Cultivated Land:

All lands, including cultivated peat lands, that have been plowed to prepare a seedbed at some point in time and have a well-defined Ap horizon.

Cumulative Releases:

The slow release of small amounts of material over a sufficiently long period of time causing the volumes to become significant and represent a potential risk to the environment.

Decommissioning:

The closure of all or part of an industrial facility, followed by the removal of process equipment, buildings and structures and surface and subsurface decontamination.

Doglegs:

An intentional angle in an access line to avoid a long line-of-sight. This helps protect wildlife from harassment, predation and hunting.

Ditch Block:

A barrier constructed across a drainage-way to retard water flow and form a small, sediment catch basin. Ditch blocks are typically constructed from timbers, rocks or gabions.

Domestic Wastewater:

The composite of liquid and water-carried wastes (associated with the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation, or other domestic purposes) and infiltration and inflow wastewater that is collectively released into a wastewater collection system.

Drilling Mud:

A suspension, usually in water but sometimes in oil (diesel), used in rotary drilling and consisting of various substances in a finely divided state (*e.g.*,

typically bentonitic clays and chemical additives). Drilling mud is introduced continuously down the drill pipe under pressure, out through openings in the drill bit, and back up in the annular space between the pipe and the walls of the hole, and then to a surface pit or tank where it is conditioned and reintroduced into the wellbore. It is used to lubricate the bit, to carry the cuttings up from the bottom, and to prevent blowouts and cave-ins.

Drilling Waste Fluids:

A mixture of water, drilling muds, additives and various other wastes that are specifically related to the drilling activity.

Drilling Waste Solids:

The bottom layer of drilling waste material that is found in a sump and is composed of water, drill cuttings, flocculated bentonite, weighting materials, and other additives.

Drilling Waste Total Waste:

The entire contents of a sump. This is considered to be a single waste for sampling, treatment and disposal.

Electromagnetic Survey (EMS):

A geophysical method of preparing high resolution imaging of the subsurface. This is done by delineating contrasts in subsurface conductivity caused by changes in groundwater quality, soil type or rock type. Depending on the type of equipment used, an EMS can detect and delineate salt and metal contamination.

Emergency Planning Zone (EPZ):

“Means that area around a well or battery which could be exposed to hazardous concentrations of hydrogen sulphide if a release of gas occurs from the well or battery, the zone to be determined either

(a) by comparing the maximum potential hydrogen sulphide release rate with Figures 1 and 2 of Schedule 1 [of the Regulation], or

(b) by approval of an authorized commission employee.” (Drilling and Production Regulation)

Equivalent Land Capability:

The condition and productivity (capability) of land that would allow it to sustain its use before disturbance. The land should be able to maintain a balanced ecological state that does not contribute to environmental deterioration and does not require human upkeep. The degree of limitations imposed by the physical characteristics of the land should be similar to the pre-disturbed limitations.

Erosion:

The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as geological creep. The negative effect of erosion is a decrease in the amount of topsoil on a specified parcel of land. This in turn alters the soil’s chemical characteristics (*e.g.*, a decrease in the

amount of nutrients for vegetation) and its physical characteristics (*e.g.*, a decrease in the amount of soil available for the growth of plant roots).

Note: It also means “the wearing away, by water, of the banks or bed of a stream or of the materials used in any works.” (Water Regulation)

Ford:

“A dip in a road constructed to facilitate crossing a stream.” (Forest Road Regulation)

Fugitive Emission:

An emission to the atmosphere of an air contaminant from a plant source other than a flue, vent, stack, or break or rupture in process equipment.

Gabions:

Rectangular containers of various sizes made of thickly galvanized steel wire mesh and filled with rock.

Groundwater:

“Means water below the surface of the ground.” (*Water Act*)

Groundwater Monitoring Network:

A number of individual monitoring wells that enable observation of physical and chemical hydrogeologic phenomena over time. Monitoring wells are distributed upgradient (for background measurements) and downgradient (for surveillance) of the facilities. Each monitoring well is used to:

- extract a groundwater sample for chemical, biological or physical testing of water quality; and,
- measure water levels.

Gullying:

The erosive process by which soil is displaced by running water, causing the formation of deep channels.

Halogenated:

The product of incorporating a halogen (*i.e.*, fluorine, chlorine, bromine or iodine) into a chemical compound.

Horizon Mixing:

Dilution of material from the A (topsoil) horizon by the B (subsoil) horizon. Horizon mixing reduces the topsoil quality by changing the texture to a class with reduced tilth, altering soil aggregation and structure, and changing the decomposition rate of soil organic matter.

Hydrogeology:

A subdivision of hydrology (the study of all waters of the earth) specifically encompassing the interrelations of geologic materials and process with water.

Hydrogeology largely addresses the occurrence, distribution, movement and chemistry of groundwater; however, there are also important interrelations between surface water and groundwater, and between the replenishment of groundwater and rainfall.

Incorporation:

An operational method where drilling waste is assimilated into soil, preventing potential migration. This is accomplished by mechanically combining the drilling waste into a consistent soil and waste mixture.

Impervious:

“Means having a permeability not greater than 1×10^{-7} cm per second when subjected to a head of 0.305 m of water.” (Special Waste Regulation)

Leak Detection Device:

A system which may include visual methods, designed for the early detection and collection of any type of leakage from a primary containment device.

Long Term Storage:

“Means the permanent holding of special waste in an aboveground indoor facility.” (Special Waste Regulation)

Low Impact Seismic (LIS):

A dynamic line cutting method that has a low impact on differing geographic conditions, forest types, stand densities, soils and water.

Monitoring Well:

A well used to detect or monitor liquid leakage from an underground primary or secondary containment device. It can also be a well placed into a specific zone to sample groundwater and detect the presence of a leachate in the groundwater aquifer or unsaturated zone.

Muskeg:

A wet area that is usually moss-floored and characterized chiefly by an organic soil. Muskeg most often refers to a black spruce woodland with a thick mat of mosses underlain by peat.

Oilfield Waste:

A substance or mixture of substances unwanted by the waste generator. These unwanted substances result from the construction, operation or reclamation of a well site, oil and gas battery, gas plant, compressor station, crude oil terminal, pipeline, gas gathering system, or a related facility.

Open-hole Abandonment:

The downhole and surface abandonment of a well after drilling is complete but before the rig is released from the site.

Passive Storage:

“Means storage of special waste in a facility where the only activity that takes place is placement, retrieval or inspection of the special waste.” (Special Waste Regulation)

Peat Lands:

Land with peat formations. Peat lands may or may not be treed.

Permanent Access Road:

A road that:

- has an established grade and drainage ditches for erosion control;
- is structurally sound for all seasons; and,
- has a maximum easement of 20 m.

Examples include gravel haul roads, roads to well sites, and any roads used for two or more years.

Permanent Bridge:

“Means a bridge whose expected life at its current location is greater than 15 years.” (Forest Road Regulation)

Plug Back:

The downhole abandonment of a portion of an open-hole well.

Potable Water:

Water that is safe for drinking, cooking, bathing, dish washing or other domestic purposes.

Primary Containment:

A device used to physically contain materials that are produced, generated and used by the upstream petroleum industry (including but not limited to, single wall tanks and containers).

Primary Sulphur Handling Facility:

A facility associated with or close to a sulphur production facility.

Reclamation:

Reclamation is conducted to return the disturbed site to a capability equivalent to the pre-disturbed site. Aspects of reclamation include reclaiming the soil and the water quantity and quality.

Recover:

A waste reduction strategy in which a portion of the waste can be segregated for subsequent reuse. This often requires off-site services.

Recycle:

The recovery and reuse of materials that would otherwise be discarded. This may require off-site services.

Remediation:

Activities carried out to reduce contaminants in the media (*i.e.*, air, soil or water) and return the media to levels acceptable for a site and the affected surrounding area.

Riprap:

“Angular rock material used to prevent erosion of stream banks and the stream bed around in-stream structures.” (Ministry of Water, Land and Air Protection 1994 Environmental Operating Guidelines)

Rollback:

Spreading debris from land clearing back over the land after the clearing program is complete. Rollback is restricted to debris less than 15 cm in diameter that has been compacted.

Rutting:

Depressions made in the soil by the tires of heavy equipment under wet soil conditions. This can result in the mixing of soil horizons and/or soil compaction, and it can promote erosion.

Sacrificial Anodes:

Anodes used in cathodic protection systems (see *Cathodic Protection System*). Cathodic protection systems take advantage of the different behaviors of two different metals placed in a conductive or corrosive medium. The less corrosion-resistant metal becomes anodic and the metal with higher corrosion resistance becomes cathodic. In the presence of an anode or anodic metal, the cathode or cathodic metal tends to corrode at a minimal or zero rate while the anodic metal corrodes at a higher rate. The corroding anode is known as a “sacrificial anode” because it is sacrificed to corrosion.

Secondary Sulphur Handling Facility:

A facility that is a significant distance away from the sulphur production facility, or one that operates under a separate approval from the production facility.

Scour:

Erosion of the floor or banks of a stream caused from high-velocity water flow. Scour causes undercutting, sloughing, siltation and altered channel flow.

Secondary Containment:

An impervious barrier placed between the primary containment device and the ground underneath it and surrounding it. This is done to contain and prevent any leakage from the primary containment device from impacting the environment.

Short Term Storage:

“Means the storage of special waste for a time period exceeding 336 hours (14 days) at the end of which time the special waste is removed for storage, treatment or disposal elsewhere.” (Special Waste Regulation)

Slash:

“Means the residue left on the ground as a result of forest and other vegetation being altered by forest practices or other land use activities.” (Forest Road Regulation)

Slumping:

The mass movement of a portion of soil from sloping terrain to a more level stance. This often occurs when soil has been distributed onto a hilly area.

Soil Quality:

The capacity of a soil to function within ecosystem boundaries in order to sustain biological productivity, maintain environmental quality and promote plant and animal health.

Soil Structure:

The arrangement of primary soil particles into secondary soil particles, units or peds. The secondary units may be arranged such that a distinctive pattern (*e.g.*, platy, blocky, sub-angular blocky, columnar, prismatic, amorphous, or single-grained) is formed. The structure’s characteristics are described by the size, shape, and degree of distinctiveness and then characterized into classes, types and grades, respectively.

Spatial Buffer Zone:

A spatial buffer zone is a specific area that remains undisturbed.

Special Waste:

Special waste includes:

- dangerous goods that are no longer used for their original purpose, including those that are:
 - recycled, treated or disposed;
 - intended for recycle, treatment or disposal; or,
 - in storage or transit before being recycled, treated or disposed;
- PCB wastes;
- waste oil; and,
- leachable toxic waste.

For a comprehensive list, refer to the Special Waste Regulation.

Stack Sampling:

Methods for measuring the emissions of air pollutants from stationary sources. This is typically used to determine compliance with regulatory criteria.

Subsidence:

The sinking of a soil that creates a depression. This process often occurs when soil has been used as fill on a site and then settles.

Sump:

An excavation or tank for holding water, drilling mud, sludge, and discharged matter from drilling operations.

Surface Disposal:

The even application of a waste over an area of land at a specified, allowable level.

Surface Soil:

The uppermost mineral or organic material that is valued as a growing medium.

Surface Soil Quality:

The quality of a soil as determined by:

- texture;
- aggregate size;
- aggregate strength;
- gravel and rocks;
- organic matter content; and,
- soil profile (*i.e.*, water permeability, vertical root elongation and soil aeration).

Suspension:

The cessation of normal production, operation or injection activities at a facility pursuant to its Commission-authorized use. The facility may not be rendered permanently incapable of its licensed use, but it must be left in a safe and stable state during this period of suspension, as prescribed by the Drilling and Production Regulation.

Temporal Buffer Zone:

A temporal buffer zone covers a specific time period in which an area remains undisturbed.

Temporary Access Road:

A roadway that:

- usually lacks any preset grades;
- is used on a temporary basis (generally two years or less) for access during dry or frozen periods (*e.g.*, a winter snow road constructed of snow and ice);
- is a maximum of 20 m and 10 m wide in summer and winter, respectively, with minimum requirements for tree clearing, grading and number of cuts and fills; and,
- may require tow-cat travel of large vehicles on some portions of the road.

Temporary Bridge:

“Means a bridge whose expected life at its current location is 15 years or less.”
(Forest Road Regulation)

Temporary Storage:

“The retention of special waste for a period of less than 336 hours (14 days) and includes, but is not limited to, the collection, packaging, handling, bulking or

holding of special waste prior to shipment, management at a facility or while en route to a destination.” (Special Waste Regulation)

Tilth:

The physical condition of soil as related to its ease of tillage, fitness as a seedbed, and its impedance to seedling emergence and root penetration.

Underground Storage Tank:

A tank that is partially or completely buried and does not allow for visual inspection of the top, complete sides and bottom of the tank without excavation.

Ungulate:

Hoofed mammals adapted for running on firm, open ground. These mammals are herbivorous and live in herds.

Vaulted Storage Tank:

A tank that is contained in a concrete or other type of solid walled space (*e.g.*, vault), either below or above ground level. The vault can be accessed through a man-way or a top that is open to the atmosphere. It may or may not be possible to visually inspect the tank on all sides.

Vegetated Land:

Land that has permanent or annual plant cover.

Wetland:

“Means a swamp, marsh or other similar area that supports natural vegetation that is distinct from adjacent upland areas.” (Operational Planning Regulation)

Workover:

“Means any operation that has changed the producing interval or producing characteristics of a well by perforating, abandoning a portion of the well, running casing or any major or recently developed stimulation operation, but does not include routine stimulation operations or the changing or replacement of equipment.” (Drilling and Production Regulation)

Zone Abandonment:

The downhole abandonment of perforations within a cased-hole, or the downhole abandonment of an open-hole interval in a cased hole. Since future downhole work may be required to fully abandon the well, surface abandonment work or uphole remedial cementing does not apply when abandoning a zone.

Appendix B Abbreviations and Acronyms

B.1 Abbreviations and Acronyms

The following are abbreviations and acronyms used in British Columbia and the Canadian upstream crude oil and natural gas industry.

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

AB	Alberta
ADR	alternative dispute resolution
AIA	Archaeological Impact Assessment
ALR	Agricultural Land Reserve (<i>British Columbia, provincial</i>)
AOA	Archaeological Overview Assessment
AST	aboveground storage tank
top	
BC	British Columbia
BCA	British Columbia Assessment
BCAA	British Columbia Assessment Authority
BCAL	British Columbia Assets and Land Corporation
bcf	billion cubic feet
BOP	blowout preventer
BTEX	benzene, toluene, ethylbenzene and xylenes
top	
C	Celsius
CAEAL	Canadian Association for Environmental Analytical Laboratories
CAGC	Canadian Association of Geophysical Contractors
CAODC	Canadian Association of Oilwell Drilling Contractors
CAPP	Canadian Association of Petroleum Producers
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CDC	British Columbia Conservation Data Centre
CEA	Cumulative Effects Assessment
CEAA	<i>Canadian Environmental Assessment Act</i>
CEMS	continuous emission monitoring system
cf	cubic foot
CIEC	Canadian Indian Energy Corporation
CISD	critical incident stress debriefing
cm	centimeter
CO ₂	carbon dioxide
COR	Certificate of Restoration
COS	Conservation Officer Service
CSA	Canadian Standards Association
CBM	coalbed methane
top	
DFO	Department of Fisheries and Oceans (<i>Canadian, federal</i>)
DIAND	Department of Indian Affairs and Northern Development
top	
EA	Environmental Assessment
EAO	Environmental Assessment Office (<i>British Columbia, provincial</i>)
EIA	Environmental Impact Assessment
EC	electrical conductivity
EMS	electromagnetic survey
ERP	emergency response plan
EPZ	emergency planning zone
EUB	Alberta Energy and Utilities Board

top	
FEARO	Federal Environmental Assessment Review Office (<i>Canadian</i>)
FPC	Forest Practices Code
FPS	flare pit sludge
FPW	flare pit waste
top	
GHG	greenhouse gas
GJ	Gigajoule
top	
ha	Hectare
HADD	harmful alteration, disruption or destruction
H ₂ S	hydrogen sulphide
HRDC	Human Resources Development Canada
top	
IWMS	Identified Wildlife Management Strategy
top	
j	Joule
top	
kg	Kilogram
km	Kilometer
top	
LRC	Land Reserve Commission (<i>British Columbia, provincial</i>)
L	Litre
LIS	low-impact seismic
LNG	liquified natural gas
LRMP	Land and Resource Management Plan
LUCO	Land Use Coordination Office (<i>British Columbia, provincial; former agency</i>)
top	
m	Meter
MAFF	Ministry of Agriculture, Food and Fisheries (<i>British Columbia, provincial</i>)
MEA	monoethylamine
MEK	methylethylketone
MEM	Ministry of Energy and Mines (<i>British Columbia, provincial</i>)
MIACC	Major Industrial Accidents Council of Canada
MDRC	maximum disturbance review criteria
MKAB	Muskwa-Kechika Advisory Board (<i>British Columbia, provincial</i>)
mm	Millimeter
MOF	Ministry of Forests (<i>British Columbia, provincial</i>)
MOU	memorandum of understanding
MSRM	Ministry of Sustainable Resource Management (<i>British Columbia, provincial</i>)
MTBE	methyl tertiary butyl ether
MWLAP	Ministry of Water, Land and Air Protection (<i>British Columbia, provincial</i>)
top	
NAICC-CC	National Air Issues Coordinating Committee—Climate Change
NCCP	National Climate Change Process
NEB	National Energy Board
NGLs	natural gas liquids
NWPA	<i>Navigable Waters Protection Act (Canadian, federal)</i>
NRCan	Natural Resources Canada (<i>Canadian, federal</i>)
top	
O&M	operations and maintenance
OGC	Oil and Gas Commission (<i>British Columbia, provincial</i>)
OSCAR	Oil Spill Containment and Recovery

[top](#)

PAS Protected Areas Strategy
PCB polychlorinated biphenyl
PEP Provincial Emergency Program (*British Columbia, provincial*)
PITS Petroleum Industry Training Service
PRRD Peace River Regional District
PROSCARAC Prairie Regional Oil Spill Containment and Recovery Advisory Committee
PSAC Petroleum Services Association of Canada
psia pounds per square inch absolute
psig pounds per square inch gauge
PTMAA Petroleum Tank Management Association of Alberta

[top](#)

ROW right-of-way

[top](#)

SAR sodium adsorption ratio
SCC stress corrosion cracking
SK Saskatchewan
SIU Special Investigations Unit
SMZ Special Management Zone

[top](#)

t Tonne
TDG transportation of dangerous goods
TDS total dissolved solids
TEA triethylamine
TFOSP Task Force on Oilspill Preparedness

[top](#)

UPITFOS Upstream Petroleum Industry Task Force on Safety

[top](#)

VCR Voluntary Challenge Registry
VOC volatile organic compounds

[top](#)

WCB Workers' Compensation Board
WCOC Western Canadian Oilspill Cooperatives
WCSS Western Canada Spill Services Limited
WHA Wildlife Habitat Area
WHMIS Workplace Hazardous Materials Information System