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of British Columbia

Oil and Gas Site Contamination Risks:

Improved oversight needed

February 2010

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The Honourable Bill Barisoff
Speaker of the Legislative Assembly
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Dear Sir:

I have the honour to transmit herewith to the Legislative Assembly of British Columbia my 2009/2010 Report 8: Oil and Gas Site Contamination Risks: Improved oversight needed.

John Doyle, MBA, CA
Auditor General of British Columbia

Victoria, British Columbia
February 2010

copy: Mr. E. George MacMinn, Q.C.
Clerk of the Legislative Assembly

Table of Contents

Auditor General's Comments 1

Executive Summary 5

BC Oil and Gas Commission Response 13

Detailed Report

- Background 19
- Responsibilities clarified, but it is too soon to assess effectiveness 25
- Information about environmental and financial risks and the procedures to oversee them need improving 29
- Accountability reporting to legislators and the public needs improving 39

Auditor General's Comments

John Doyle
Auditor General

The oil and gas industry in British Columbia has grown rapidly over the last decade and is a major contributor to the provincial economy. The significant growth of the industry has brought with it environmental and financial risks that need to be overseen by the government. The BC Oil and Gas Commission was established as the primary regulator of the industry, but the Ministry of Environment also has significant responsibilities under the Environmental Management Act.

Given the rapid growth of the industry and its importance to British Columbia, I felt it important to carry out an audit at this time. British Columbians value the contributions the Oil and Gas Industry makes to the province but they also want government to ensure that industry complies with the high standards necessary to protect the environment and to meet its financial obligations to restore sites. At the same time, industry wants to operate in an appropriate manner and to have certainty about government's expectations.

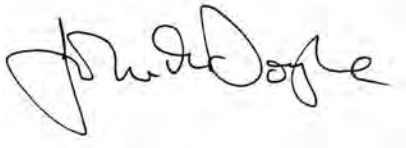
The audit was designed to assess whether the BC Oil and Gas Commission is providing adequate oversight of the risks associated with upstream (exploration to abandonment) oil and gas site contamination. I concluded that improvements are needed to adequately meet our expectations. I had expected more progress because this is not our first audit dealing with contaminated sites in British Columbia. The Office's 2002/03 report on provincial contaminated sites raised similar issues to those we found in the current audit, including: an incomplete inventory of contaminated sites and their status; the inability to provide information about the risk borne by the Province for contaminated sites; and the need to assess provincial performance security provisions to ensure operators fulfill their site restoration responsibilities. We also found that the accountability information the BC Oil and Gas Commission provides to the Legislative Assembly and public is not sufficient to allow them to understand how effectively oil and gas site contamination risks are being managed.

Nevertheless, I have reason to be encouraged about the situation. At the completion of our audit, some initiatives were underway that, if fully implemented, should help to better protect the Province from any potential risks associated with oil and gas site contamination. For example, progress has been made on establishing classification guidelines for identifying high priority

Auditor General's Comments

sites where restoration must be overseen by the Ministry of Environment. Procedures were also being developed to help ensure operators have the capacity to meet their site restoration responsibilities. Discussions were underway about auditing restored sites to ensure that the work has been done properly. And, the BC Oil and Gas Commission has recently released more comprehensive information about its oversight activities. These encouraging developments have been helped along by our audit.

I would like to thank the staff of the BC Oil and Gas Commission and other agencies we contacted for their assistance during this audit. We hope that this report will help them better protect the province from potential environmental and financial risks associated with oil and gas site contamination.



John Doyle, MBA, CA
Auditor General of British Columbia

Victoria, British Columbia
February 2010

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Executive Summary

Executive Summary

Activities in the oil and gas sector have recently been at record levels in British Columbia and the industry has become a significant component of the provincial economy, contributing $2.3 billion to provincial revenue during 2008/09.

Currently there are about 20,400 oil and gas well sites in the province, with the vast majority of activity taking place in northeast British Columbia.

The oil and gas sector includes several "upstream" processes: exploration, well completion and production. During all of these activities, a range of site contamination can occur and at significant contamination levels there exists a potential for environmental and human health impacts. Site restoration and related risk is the responsibility of well operators by law, however, there is a potential risk of some operators not fulfilling their responsibilities due to their financial viability.

The Province maintains a number of provisions, which help limit the transfer of these responsibilities from the operator. These provisions include: the Commission's Legislative authority under the Oil and Gas Commission Act; the Petroleum and Natural Gas Act; security deposits; management of the Orphan Sites Reclamation Fund; and the powers of the Environmental Management Act.

Still, there is risk that the Province may become liable for the site restoration costs if previous operators are not found and if Orphan Sites Reclamation Fund monies are insufficient. In British Columbia, the BC Oil and Gas Commission (OGC) has responsibility to manage these risks through oversight activities designed to ensure that industry meets its obligations and by managing the Orphan Sites Reclamation Fund. The Ministry of Environment also has significant responsibilities associated with site contamination risks under the Environmental Management Act.

Audit purpose and scope

The purpose of our audit was to assess whether the OGC is providing adequate oversight of upstream oil and gas site contamination risks. Specifically, we asked the following questions:

- Are agency responsibilities for overseeing site contamination risks clear?

- Is the OGC fully aware of the environmental and financial risks associated with upstream oil and gas site contamination and has it established appropriate procedures to oversee the risks?
- Is the public information provided by the OGC on its oversight activities adequate to allow legislators and the public to understand how effectively site contamination risks are being managed?

Our examination focused on the OGC and its oversight of upstream oil and gas site contamination risks. The fieldwork component of the audit was carried out from December 2008 to March 2009 in accordance with the standards for assurance engagements established by the Canadian Institute of Chartered Accountants. Subsequently, further discussions, analysis and assessment was conducted prior to completing the report.

Audit conclusion

The OGC's oversight of the environmental and financial risks associated with oil and gas site contamination needs improving. The responsibilities of the key agencies with a role in overseeing the risks were recently clarified in a Memorandum of Understanding; however, more time is needed before the effectiveness of these arrangements can be assessed. The oil and gas industry in British Columbia has grown rapidly over the last several years and the number of sites that have not been restored has similarly grown. This could result in additional pressure on the Orphan Sites Reclamation Fund and could increase the risk of liability transfer to the Province because of operators failing to meet their site restoration responsibilities. Improvements in the regulatory information collected and oversight procedures are needed to better protect the Province from these risks. In addition, public information provided by the OGC on its oversight activities is not sufficient to allow the Legislative Assembly and public to understand how effectively oil and gas site contamination risks are being managed.

Executive Summary

Key findings and recommendations

Responsibilities clarified, but it is too soon to assess effectiveness

Two legislated regimes in British Columbia deal with contaminated sites: the Petroleum and Natural Gas Act and the Contaminated Sites Regulation under the Environmental Management Act. The primary government agencies involved in overseeing site contamination risks (the OGC and the Ministry of Environment) agreed in 2006 that the two regimes created uncertainty for the industry and made it difficult for the agencies to work together effectively.

Accordingly, the BC Upstream Petroleum Environmental Task Group was formed to aid in developing technical and regulatory initiatives aimed at achieving high standards of environmental quality in the management of wastes and contaminants in the upstream oil and gas sector.

Membership in the task group includes representatives from government departments, regulators, the upstream petroleum industry and subject matter experts. Government representation includes the Ministry of Environment, the Ministry of Energy, Mines and Petroleum Resources, the OGC, the Ministry of Agriculture and Lands and other government agencies and departments as needed.

The OGC and the ministries developed a Memorandum of Understanding (MOU), signed in August 2008, clarifying the roles of all parties and forming the basis for developing procedures to improve the oversight of site contamination risks. Once the site classification guidelines (discussed later in this report) are operational, the OGC and the Ministry of Environment will have an opportunity to assess how well the MOU arrangements are working. For these reasons we determined that it was too soon to assess the effectiveness of the MOU.

Information about environmental risks and the procedures to oversee them need improving

The OGC has been working with industry and other agencies involved in overseeing site contamination risks to develop site classification guidelines for identifying high priority sites requiring oversight by the Ministry of Environment. The guidelines were not

in place when we completed our audit in March. As a result, with no accepted process for accurately assessing the sites, a growing number of those eligible for a Certificate of Restoration have not been assessed even though operators are required to apply for a certificate within 24 months of a site being decommissioned. Having a large number of inactive wells can increase the risk that environmental concerns will not be addressed in a timely manner and therefore, could become more serious. We recommended that the OGC and the Ministry of Environment implement appropriate site classification guidelines for the restoration of oil and gas contaminated sites.

It is anticipated that once the guidelines are approved, operators will begin to request Certificates of Restoration in larger numbers than has been the case. If so, OGC would not likely be able to process them quickly. We recommended that the OGC assess the resources required to process backlogged sites once the site classification guidelines are operational.

There are also a number of sites known as "legacy sites" that were certified as reclaimed to environmental standards of the day before the OGC was established, and before modern standards existed. We found that the OGC has not prepared a formal risk assessment ranking of these sites to help ensure that the potential risks are properly managed. We recommended that the OGC assess the risks associated with legacy sites and develop a suitable workplan to deal with the risks.

An independent field review of sites that have received a Certificate of Restoration is not carried out to ensure that objective assessments are being made. The OGC relies mainly on desk reviews of consultant restoration reports, submitted by operators, to provide oversight of the certificate process. Only limited field monitoring occurs at sites undergoing restoration, so there is less assurance that sites are being restored properly. The OGC reports that it will evaluate the need for periodic independent audits of the Certificate of Restoration process.

Good management practices suggest that the audit role should be independent of the OGC. We recommended that the OGC work with the Ministry of Environment to implement an independent audit program.

OGC's mandate includes an expectation that it fosters a healthy environment. We found that, while the OGC has supported the development of some tools and methodologies to assess cumulative effects, no formal provincial program is yet in place to help manage the environmental effects of developments on the land base. We recommended that the OGC work in conjunction with key government ministries and other stakeholders to assist in developing a formal program for conducting cumulative effects assessments.

Information about financial risks and the procedures to oversee them need improving

As noted above, site classification guidelines were not yet in place at the end of March 2009. Thus, a growing number of sites that are eligible for a Certificate of Restoration have not been assessed. Having a large number of inactive wells has the potential to increase the likelihood that an operator will not meet its restoration responsibilities. We recommended that the OGC ensure that its well site information allows risks to be assessed and that regulatory oversight is provided to ensure that inactive sites are restored in a timely manner.

There is a potential risk that a site operator will fail to meet its site restoration responsibilities as a result of business failure or a significant change in ownership. In these circumstances, the Province relies on a number of provisions including the Commission's Legislative authority under the Oil and Gas Commission Act; the Petroleum and Natural Gas Act; security deposits; the Orphan Sites Reclamation Fund and powers under the Environmental Management Act to address any liability that may exist. Information on this potential liability relative to the capacity of the Province's safety net would improve oversight of the risk.

We also found that the security deposits collected from operators at the time of initial drilling may not be sufficient to properly restore all sites. To improve individual operator site restoration accountability and reduce the potential burden on the Orphan Sites Reclamation Fund, the OGC has been working on a process to ensure that operators have adequate assets to meet their site restoration responsibilities. However, the changes were not in effect at the time we were completing our audit. We recommended that

the OGC ensure that operator net assets and security deposits are sufficient, and reassessed on an ongoing basis, to cover the potential cost to the Province of dealing with site decommissioning and restoration.

There are currently 38 orphan sites in the province—historical sites with no identifiable owner. The OGC is dealing with the 14 sites in northeast British Columbia, while the remaining 24 sites, located mainly in the province's southeast, are being investigated to determine if any further restoration action is needed. We recommended that the OGC complete its assessments of the remaining orphan wells and, where appropriate, complete their restoration.

Accountability reporting to legislators and the public needs improving

The public information provided by the OGC on its oversight activities is not sufficient to allow the Legislature and public to understand how effectively oil and gas site contamination risks are being managed.

In its 2007/08 Annual Report, the OGC reports on major compliance rates observed during its inspections of operators' exploration and development activities. A number of parameters are checked during each inspection and the rates reflect the total number of individual inspection parameters found to be in compliance, as a percentage of an estimate of the total number of such parameters across all sites inspected. The Annual Report shows a compliance rate of 98%.

We found that the reported compliance rate is deficient for two main reasons:

- The rate represents the state of compliance after operators have taken steps within the prescribed time period to correct deficiencies found during OGC inspections. The initial rate of compliance before corrections are made is not reported.
- The OGC was unable to confirm how many inspection parameters checked related to site contamination risks. This is because the detailed results of inspections are documented but are not summarized for reporting purposes.

The Annual Report also identifies that 4,426 site inspections were carried out during the period. We found, however, that the OGC does not report publicly on how many of the sites had at least one deficiency nor the number of inspections that involved a serious or major deficiency that had the potential to cause an adverse impact on the public, the environment or both.

To improve transparency and accountability, it is important for OCG to improve its information collection system and public reporting. Information such as: the general compliance rate; the statistics before and after deficiencies have been corrected; the significance of non-compliance; the degree to which the non-compliance relates to site contamination and other categories of significant deficiencies; and whether the deficiencies have been rectified, demonstrate transparency and accountability and are important to the Legislature and public. We recommended that the OGC improve reporting to the Legislature and public about how effectively site contamination risks are being managed.

BC Oil and Gas Commission Response

The Commission currently receives its legislative authority from the Oil and Gas Commission Act, Petroleum and Natural Gas Act, Pipeline Act and other specified enactments. Through these Acts, the main tools available to the Commission for overseeing risk management associated with oil and gas contaminated sites are compliance and enforcement field activities, well suspension requirements, security deposits and management of the Orphan Sites Reclamation Fund. Management of contaminated sites will improve from the implementation of a liability rating system to manage security deposits, enhanced administrative tools when the new Oil and Gas Activities Act comes into force, a Memorandum of Understanding clarifying responsibilities between the Commission and the Ministry of Environment and a new remediation site classification tool.

The Commission issued the 2008 Annual Site Restoration Report that addresses the audit report findings and recommendations on: transparent reporting, performance measures, professional assurance, well site contamination risk information and inactive, legacy and orphan sites. The Commission's 2008 Annual Site Restoration Report can be found at: http://www.ogc.gov.bc.ca/documents/annualreports/2008%20Annual%20Site%20Restoration%20Report.pdf

Response to Specific Recommendations

Site Classification

We recommend that the OGC and the Ministry of Environment implement appropriate site classification guidelines for the restoration of oil and gas contaminated sites.

Commission Response:

The Commission has recently implemented the site classification guidelines.

BC Oil and Gas Commission Response

Resources to Address Backlog of Applications

We recommend that the OGC assess the resources required to process backlogged sites once the site classification guidelines are operational.

Commission Response:

The Commission assesses staffing requirements on an annual basis as part of its regular business planning cycle.

Legacy Sites

We recommend that the OGC assess the risks associated with legacy sites and develop a suitable workplan to deal with the risks.

Commission Response:

The legal authority to request industry to conduct environmental reviews and any additional remediation work on legacy sites is contained within the Environmental Management Act.

Independent Review of Restored Sites

We recommended that the OGC work with the Ministry of Environment to implement an independent audit program.

Commission Response:

The Commission in 2010 will be implementing a post-certification compliance assurance review that involves the physical investigation of a representative number of sites to provide assurance that the environmental site conditions are consistent with those documented on the applications received by the Commission. The Commission will evaluate the need for periodic independent audits as a good management practice.

BC Oil and Gas Commission Response

Cumulative Effects Assessments

We recommend that the OGC work in conjunction with key government ministries and other stakeholders to assist in developing a formal program for conducting cumulative effects assessments.

Commission Response:

Government has many policies, practices and procedures that integrate natural resource management in a way that addresses and, where necessary, provides mechanisms to analyse cumulative impacts.

The Commission agrees that the cumulative effect of multiple land based activities is an important consideration towards fulfilling our environmental mandates. In conjunction with key government ministries, we have been developing additional tools contained in new legislation and regulation that will increasingly contribute towards a provincial framework for managing cumulative effects.

Inactive Sites

We recommend that the OGC ensure that its well site information allows risks to be assessed and that regulatory oversight is provided to ensure that inactive sites are restored in a timely manner.

Commission Response:

Although the number of inactive sites is growing, the ratio of inactive wells to total wells has remained constant over the Commission's tenure. Given the significant expansion of industry activity over this time, this constant ratio indicates active management of potential risks. In April 2009, the Commission issued Well Suspension Requirements which outlines the requirements for the appropriate suspension and reporting in inactive wells.

BC Oil and Gas Commission Response

Security Deposits

We recommend that the OGC ensure that operator net assets and security deposits are sufficient, and reassessed on an ongoing basis, to cover the potential cost to the Province of dealing with site decommissioning and restoration.

Commission Response:

The Commission is implementing a liability rating system that assesses security deposit requirements for each permitted operator in British Columbia based on the ratio of oil and gas production assets to site reclamation cost estimates. These ratios are calculated monthly and form the Commission's primary tool for assessing security deposits. Once the system is operational in 2010/11, operators with a low ratio of assets to liabilities will be expected to provide financial security sufficient to address any gaps between the production asset value and environmental liability.

Orphan Sites

We recommend that the OGC complete its assessments of the remaining orphan wells and, where appropriate, complete their restoration.

Commission Response:

The Commission will continue with priority assessments and reclamation operations according to resources available and assessed risks.

Transparent Reporting

We recommend that the OGC improve reporting to the Legislature and public about how effectively site contamination risks are being managed.

Commission Response:

The Commission agrees with this recommendation and have taken steps to improve transparency and reporting.

Detailed Report

Background

The oil and gas sector is a key component of the provincial economy. Activities in this sector have been at record levels. In 2007/08, the sector contributed more than $1.7 billion (royalties, fees and rentals) to provincial revenue. And in 2008/09, that figure reached $2.3 billion.

Statistics show there are currently about 20,400 oil and gas well sites in British Columbia, with the vast majority of provincial oil and gas activities taking place in the northeast part of the province. Those sites are shown in Exhibit 1 and include the following:

- 10,300 sites that are active
- 4,300 sites that are suspended (inactive)
- 2,000 sites that are decommissioned (inactive and awaiting Certificates of Restorations)
- 3,800 sites that have received Certificates of Restoration
- 38 orphaned sites

More than 4,500 new wells were drilled in the last four fiscal years in northeast BC. Companies that explore for, develop and produce oil and gas resources are said to make up the "upstream" oil and gas sector.

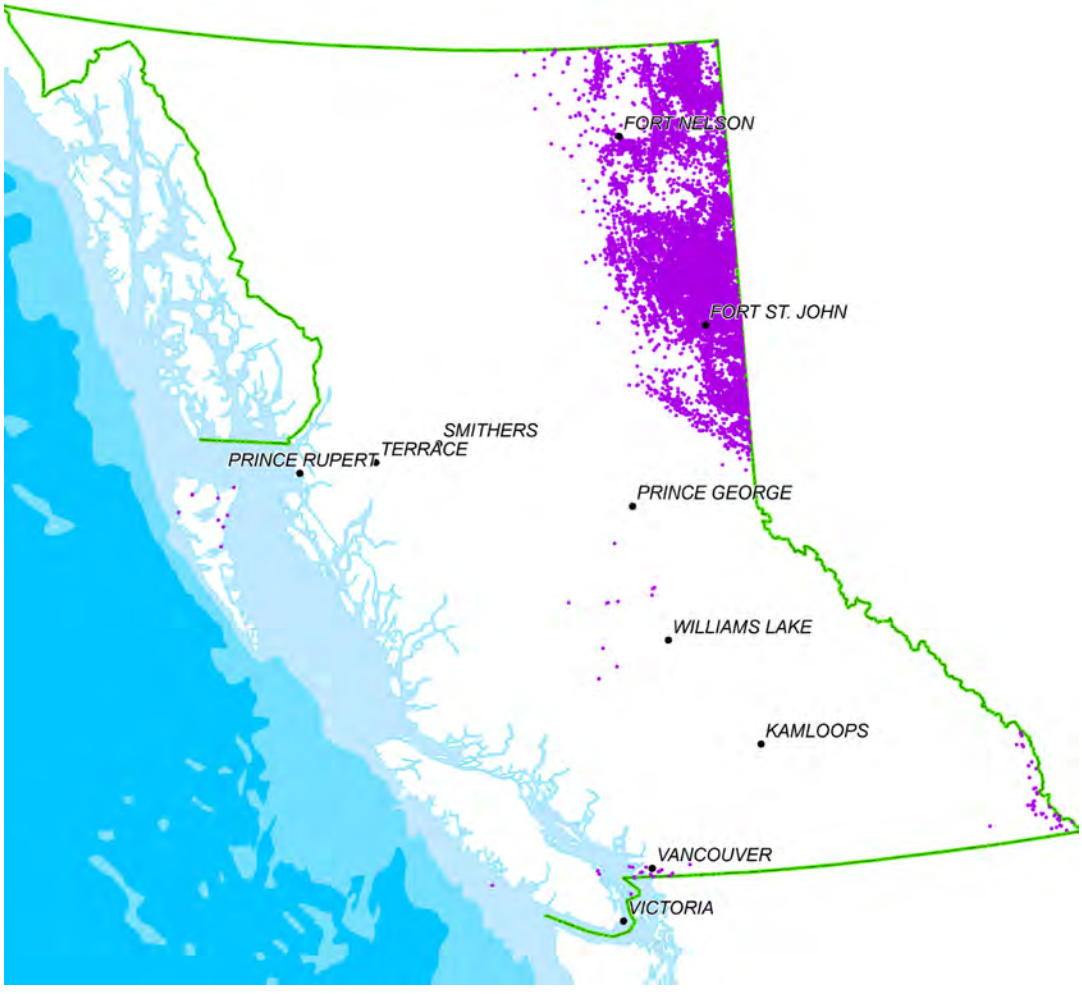
The BC Oil and Gas Commission (OGC) is an independent, single-window regulator of oil and gas activities in the Province of British Columbia. The Commission has regulatory responsibility for industry activity from the exploration and development phases, through to facilities operation and decommissioning. It is charged with balancing a broad range of environmental, economic and social considerations. Among its more specific objectives are; public safety, conservation of petroleum resources, fostering a healthy environment, and equitable participation in production.

What is the life cycle of an oil and gas well?

Well development occurs after exploration has located an economically recoverable field. If hydrocarbons are found in sufficient quantity to be economically viable then a well may be completed and put into production, otherwise it may be suspended in anticipation of changes to market conditions or decommissioned and restored.

Exhibit 1

Location of Oil and Gas Well Sites in British Columbia



Prepared by the Integrated Land Management Bureau using data supplied by the OGC
Readers should understand that well-site footprints are exaggerated due to the scale of the map

Production is the process of extracting the hydrocarbons and separating the mixture of liquid hydrocarbons, gas, water and solids, removing the constituents that are not saleable and selling the liquid hydrocarbons and gas. Oil is nearly always processed at a refinery. Natural gas may be processed to remove impurities either in the field or at a natural gas processing plant. The BC oil and gas sector is predominantly gas production.

Upstream oil and gas activities end with legal abandonment of a well. Under the provincial Petroleum and Natural Gas Act a well cannot be classified as a legally "Abandoned Well" until a Certificate of Restoration has been issued by the OGC. The receipt of an approved Certificate of Restoration allows the operator to extinguish the surface lease for the site. For sites on Crown land, the receipt of an approved Certificate of Restoration allows the OGC to cancel the corresponding surface tenure for the location.

What is oil and gas contamination?

Contaminants found at upstream oil and gas sites include various types of hydrocarbons, naturally occurring radioactive substances, trace metals, salts, various process chemicals, and herbicides. Certain concentrations of these substances can be hazardous to human health and the environment. The Contaminated Sites Regulation sets out the substances, standards and conditions that can lead to a site being defined as a "contaminated site."

How is oil and gas contamination prevented?

Contamination at oil and gas sites can be reduced through regulations, good industry operating standards and a compliance and enforcement regime. However, even with these measures in place some degree of site contamination can occur.

How is contamination addressed at oil and gas sites?

Contamination at oil and gas sites is addressed through remediation and reclamation. Remediation is the clean-up of contaminants to ensure they do not further adversely affect humans, aquatic life, wildlife and vegetation. Soil remediation at upstream sites in British Columbia is typically done by excavating the contaminated soil and disposing of it at a secure landfill. Soil can also be remediated on site using land treatment or by containing the contaminants at the site. Reclamation is the process of restoring the surface environment to acceptable pre-existing conditions and includes contouring and re-vegetating the site. In many parts of this report, we refer to the remediation and reclamation process together as simply "restoration."

Detailed Report

Who is responsible for restoring oil and gas sites in British Columbia?

Oil and gas companies (both current and historical) are responsible for the remediation and reclamation of sites under the authority of the Environmental Management Act, the Oil and Gas Commission Act, and the Petroleum and Natural Gas Act. The OGC is responsible for (1) determining the need for investigation to assess contamination, and (2) ensuring that the companies have fulfilled their restoration responsibilities. The Ministry of Environment is responsible for the development of contaminated sites regulatory standards.

How is the restoration of oil and gas sites currently being addressed in British Columbia?

Well sites and facilities must be restored according to regulatory standards described under the Certificate of Restoration which is administered by the OGC. Standards exist for different land uses such as industrial, wildlands, and agriculture. All well sites and processing facilities that are no longer used for oil and gas production must be reclaimed to receive a Certificate of Restoration from the OGC.

Audit expectations

The purpose of our audit was to assess whether the OGC is providing adequate oversight of upstream oil and gas site contamination risks. Specifically, we wanted to answer the following questions:

- Are agency responsibilities for overseeing site contamination risks clear?
- Is the OGC fully aware of the environmental and financial risks associated with upstream oil and gas site contamination and has it established appropriate procedures to oversee the risks?
- Is the public information provided by the OGC on its oversight activities adequate to allow legislators and the public to understand how effectively site contamination risks are being managed?

Courtesy: BC Ministry of Environment
An example of oil and gas site contamination before restoration

Responsibilities clarified, but it is too soon to assess effectiveness

We expected that the responsibilities of all government agencies with an oversight role associated with upstream oil and gas site contamination risks would be clearly defined and understood.

The responsibilities of government agencies with a role in overseeing site contamination risks have recently been clarified but it is too soon to assess the effectiveness of these arrangements. A Memorandum of Understanding was signed in August 2008 clarifying the roles of all parties involved. This now forms the basis for developing procedures to improve the oversight of site contamination risks.

For a time, responsibilities among agencies involved in overseeing site contamination risks were unclear

Two legislated regimes in British Columbia deal with contaminated sites: the Petroleum and Natural Gas Act and the Contaminated Sites Regulation under the Environmental Management Act. Agencies involved in overseeing site contamination risks (primarily OGC and the Ministry of Environment) recognized that the two regimes created uncertainty for the industry and it was difficult for the involved agencies to work together effectively. For example, meeting OGC requirements may not provide certainty to industry that Ministry of Environment requirements are met. As a result, in 2006, the agencies agreed that the regulatory process for restoring upstream oil and gas sites, which had evolved over the last four decades, was no longer effective.

The BC Upstream Petroleum Environmental Task Group was formed in that same year to provide a forum for the collaborative development of technical and regulatory initiatives aimed at achieving high standards of environmental quality in the management of wastes and contaminants in the upstream oil and gas sector.

Responsibilities clarified, but it is too soon to assess effectiveness

Courtesy: BC Ministry of Environment
An oil and gas drilling site in northeast British Columbia

Membership in the task group is composed of representatives from government departments, regulators, the upstream petroleum industry and subject matter experts. Industry representation is coordinated through the Canadian Association of Petroleum Producers. Government representation includes the Ministry of Environment, the Ministry of Energy, Mines and Petroleum Resources, the OGC, the Ministry of Agriculture and Lands, and other government agencies and departments as needed. The task group has worked to support the development of a number of different technical standards.

Responsibilities clarified, but it is too soon to assess effectiveness

A recently signed Memorandum of Understanding clarifies the responsibilities of key agencies

A Memorandum of Understanding (MOU) to help ensure the efficient and effective administration of authorities under the legislation pertaining to the restoration of upstream oil and gas sites was signed in August 2008. The key agencies signing were the OGC, the Ministry of Environment, the Ministry of Agriculture and Lands, and the Ministry of Energy, Mines and Petroleum Resources.

The MOU outlines guiding principles, roles and responsibilities and a collaborative framework for coordinating and streamlining administrative functions and procedure development. The guiding principles of the agreement call for:

- clear, consistent and practical regulatory requirements that promote environmental best management practices during operation and high standards of environmental quality upon closure of upstream oil and gas sites;
- efficient, effective, integrated administrative procedures for reviewing and authorizing the investigation and restoration of oil and gas sites;
- regulatory procedures that support and encourage restoration of oil and gas sites and that minimize the potential for orphan sites and liability transfer to the Province; and
- regulatory requirements commensurate with levels of risk-reduction achieved, with consideration of both short-term and long-term environmental, social and economic outcomes.

The MOU explains that, under the Environmental Management Act and the Contaminated Sites Regulation, the OGC is the decision-making authority for site profiles on oil and gas sites. The Ministry of Environment and the OGC also agreed to collaboratively develop a high priority oil and gas site classification framework to distinguish high priority sites from lesser risk sites. This classification is to be adopted into the OGC's site profile decision framework and will provide guidance by which all oil and gas sites are screened either into, or exempted from, a high priority designation. The OGC's site profile decision framework aims to ensure that all high priority sites receive Ministry of Environment oversight. As our audit fieldwork was concluding at the end of March, the parties were continuing to work toward agreement on the high priority oil and gas site classification guidelines.

Responsibilities clarified, but it is too soon to assess effectiveness

Once the site classification guidelines are operational, the OGC and the Ministry of Environment will have an opportunity to assess how well the MOU arrangements are working. Accordingly, we determined that it was too soon to assess the effectiveness of the MOU.

Information about environmental and financial risks and the procedures to oversee them need improving

There are two main areas of risk associated with upstream oil and gas sites. First, the activities may have environmental impacts with lasting negative effects on soil, surface water and groundwater quality. Second, a site operator may fail to meet its site restoration responsibilities and the Province may become liable for the costs. Given both of these risk areas, it is important that oil and gas sites be accurately assessed and that operators fully meet their site restoration responsibilities as soon as practical.

Accordingly, we expected the OGC to:

- be fully aware of the environmental and financial risks associated with upstream oil and gas site contamination risks; and
- have established procedures to adequately oversee the risks.

The information on the environmental and financial risks associated with site contamination and the procedures to oversee them need improving.

Government agencies have been working along with the oil and gas industry to develop site classification guidelines, but the guidelines were not yet in place at the completion of our audit. As a result, a growing number of sites that are eligible for a Certificate of Restoration have not been assessed. Furthermore, there is no independent auditing of the sites that have received a Certificate of Restoration to ensure they have been restored properly, and the additional resources needed to deal with backlog and legacy sites needs to be assessed once the guidelines are operational.

Overseeing environmental risks

Once a well becomes inactive, it is important to ensure that environmental risks are properly managed. We therefore expected to find:

- clear site risk classification guidelines to help identify high priority sites;
- an assessment of the resources needed to process applications for site restoration; and
- an independent review process to ensure that sites are properly restored.

Information about environmental and financial risks and the procedures to oversee them need improving

Site risk classification guidelines needed to oversee environmental risks are not in effect

As noted above, operators of oil and gas sites and production facilities must, under the Petroleum and Natural Gas Act, receive a Certificate of Restoration from the OGC to show a site has been properly decommissioned and the site restoration responsibilities met.

Site risk classification varies on a site-by-site basis depending on the nature and extent of contamination, site geology and hydrogeology, and site proximity to receptors (that is, plants, animals or humans exposed to the contaminant). Some sites may require relatively minor restoration work; others may require extensive and costly work. Under the MOU that lays out roles and responsibilities for contaminated sites, the Ministry of Environment will oversee operator restoration of high priority sites.

A key element of holding operators accountable for their site restoration responsibilities is to have guidelines in place for classifying the sites in terms of their environmental and human health risk. We found, however, that because such guidelines were not yet in effect, there was no accepted process for accurately assessing the sites.

The Ministry of Environment had proposed a risk ranking protocol for contaminated sites, called Protocol 12. Industry subjected 65 sites to Protocol 12 and concluded that it would result in an inappropriately high number of oil and gas sites in northeast British Columbia being designated as high risk. Responding to industry's concerns, the OGC began working collaboratively with the Ministry of Environment in 2006 to develop a new set of site classification guidelines for the restoration of oil and gas contaminated sites. A draft of these guidelines was distributed in April 2009 but, at the time we were writing this report, the parties had not yet formally agreed to implement them.

We recommend that the OGC and the Ministry of Environment implement appropriate site classification guidelines for the restoration of oil and gas contaminated sites.

Information about environmental and financial risks and the procedures to oversee them need improving

Courtesy: BC Ministry of Environment
A site undergoing restoration during winter

The resources needed to process backlogged and legacy sites have not been assessed

While the OGC is working with its stakeholders to develop high priority site classification guidelines, it is also reviewing and issuing Certificates of Restoration for sites that are thought to have a low risk for contamination. The OGC believes that its current staffing is adequate to carry on with this level of work. However, it is anticipated that once the site risk classification guidelines are implemented, industry may begin to submit greater numbers of applications in order to begin clearing the approximately 5,000 inactive sites that industry has indicated are candidates for restoration. Depending on how many sites industry chooses to submit on an annual basis, there may be a requirement for additional OGC resources.

Information about environmental and financial risks and the procedures to oversee them need improving

We recommend that the OGC assess the resources required to process backlogged sites once the site classification guidelines are operational.

The risks associated with legacy sites have not been formally assessed

There are about 3,500 legacy sites that received a Certificate of Restoration as reclaimed to environmental standards of the day before the OGC was established in 1998, and before the new restoration standards were introduced. We found that the OGC has not prepared a formal risk assessment ranking of these sites to help ensure the risks are properly managed.

We recommend that the OGC assess the risks associated with legacy sites and develop a suitable workplan to deal with the risks.

An independent review of sites receiving a Certificate of Restoration is not carried out

We found that an independent field review of sites that have received a Certificate of Restoration is not carried out to ensure that objective assessments are being made. In providing oversight of the restoration process, the OGC relies mainly on desk reviews of consultant restoration reports submitted by operators. At one time, visual inspections were conducted on sites that had received a certificate, but over the last two years the inspection of such sites has been reduced. As a result, Certificate of Restoration sites are generally not part of the inspection plan unless a public complaint is made. This concerns us because limited physical monitoring is occurring at sites undergoing restoration, so there is less assurance that sites are being restored properly.

To address this risk, the OGC plans to evaluate the need for periodic independent audits of the Certificate of Restoration process. Good management practices suggest that the audit role should be independent of the OGC.

We recommend that the OGC work with the Ministry of Environment to implement an independent audit program.

Information about environmental and financial risks and the procedures to oversee them need improving

Courtesy: Ministry of Environment
An inactive well site in northeast British Columbia

Improvement is needed in the assessment of cumulative effects of land based activities on the environment, including the oil and gas industry

The OGC's mandate includes an expectation that the Commission fosters a healthy environment. A report written primarily for the OGC in 2003 recommended that a cumulative effects assessment and management framework be implemented to manage the environmental effects of developments on the land base. The report was a response to concerns in the region about the possible worsening environmental effects due to multiple land and resource use activities. A key recommendation was that a dual-track approach be adopted so the cumulative effects can be addressed at two levels: project-specific and regional. While the OGC has supported the development of some tools and methodologies to assess cumulative effects no program is yet in place. To follow through on this recommendation will require the involvement of OGC, a number of key ministries and other stakeholders.

Information about environmental and financial risks and the procedures to oversee them need improving

We recommend that the OGC work in conjunction with key government ministries and other stakeholders to assist in developing a formal provincial program for conducting cumulative effects assessments.

Overseeing financial risks

The second area of risk where oversight is needed is financial — the risks associated with an operator failing to meet its site restoration responsibilities. This can happen if the operator goes out of business or if its ownership structure changes significantly (e.g., with new owners assuming control of the entity). In either situation, if the oversight controls implemented by the OGC prove inadequate, the Province could become liable. Accordingly, we expected there to be:

- a reliable inventory of sites with information about their status;
- financial security posted by operators to help ensure that they meet their site restoration responsibilities; and
- an industry funded "Orphan Fund" to mitigate against environmental clean-up costs in situations where an operator cannot be held accountable.

Information about inactive well sites needs improving

Oil and gas wells can become inactive because they have ceased to produce or have been temporarily capped off. There are about 6,300 inactive wells (suspended and decommissioned) in British Columbia. The OGC is responsible for ensuring that inactive wells are properly maintained and, as necessary, legally abandoned in a timely manner.

We noted earlier in this section that contamination risk classification guidelines were under development but had not been established by the time we completed our audit. As a result, a large number of sites have not been assessed. This large number of inactive wells can contribute to cumulative impact issues, increase environmental and public safety risks, and increase the likelihood that an operator will not fulfill its site restoration responsibilities.

Information about environmental and financial risks and the procedures to oversee them need improving

A recent OGC review showed that the number of suspended wells in British Columbia doubled from approximately 2,000 in 1990 to about 4,000 in 2008. The review noted that, in the vast majority of cases, the OGC did not have sufficient information to establish whether a given well was appropriately suspended or not. Such a situation can increase the risk that some site restoration costs will end up being borne by the Province should the Orphan Sites Reclamation Fund be insufficient. Since we completed our audit fieldwork, the OGC has released an information note requiring all operators to bring their suspended wells into compliance within the next two years.

We recommend that the OGC ensure that its well site information allows risks to be assessed and that regulatory oversight is provided to ensure that inactive sites are restored in a timely manner.

Operator security deposits do not adequately mitigate the financial risks

Another measure the OGC has in place to help manage the financial risk of an operator not meeting its site restoration responsibilities is to require security deposits. The OGC Commissioner approved formal security deposit requirements in January 2004. Every well operator must submit a security deposit as required under the Petroleum and Natural Gas General Regulation. Deposits can be used by the OGC to restore a site in the event that the owner of the well becomes insolvent. A deposit may also be refunded if a Certificate of Restoration is issued for the well or test hole for which the deposit was required. However, the Act makes it clear that the return of the deposit does not relieve the well owner of liability.

We found that the security deposits collected from operators at the time of initial drilling may not be sufficient to properly restore all sites. Before 1992, the regulation set the amount of deposit for a well at between $7,500 and a maximum of $30,000. In practice, however, a deposit was held only for an operator and not for a particular well. Thus, regardless of how many wells it operated, a company typically made only the minimum $7,500 deposit. To further accommodate this practice, the regulation has since been changed so that the amount of deposit for an operator is set at $7,500 (unless a greater amount is specified). This remains the practice today and, as a result, has allowed a number of junior companies to operate in British Columbia with only the minimum $7,500 deposit. Since 1992, a higher deposit amount for companies

new to British Columbia has been assessed, but it still applies only on a per-operator basis, not a per-well basis.

An internal OGC report dated February 24, 2006, concluded that the $7,500 deposit held for some companies is inadequate to pay for well decommissioning and site restoration and that $100,000 was a more realistic minimum amount. The report also stated that the OGC was not periodically reviewing all companies to determine if their deposit amount continued to be sufficient. We note, however, that the OGC is developing a system to monitor the adequacy of each operator's net assets and to request an operator to post additional security if that is felt to be necessary.

While many informal estimates of the potential financial liability of sites (based on site risk-ranking) exist, the large number of sites not yet ranked—5,000 estimated by industry—means that the estimated total liability is unknown. A consultant contracted by the Canadian Council for Ministers of the Environment in 2007 estimated total corporate liability associated with upstream oil and gas sites in British Columbia at over $1 billion. Information on this liability relative to the capacity of the provincial risk management safety net would improve the oversight of this potential risk.

We recommend that the OGC ensure that operator net assets and security deposits are sufficient, and reassessed on an ongoing basis, to cover the potential cost to the Province of dealing with site decommissioning and restoration.

The OGC has restored several orphan sites and is investigating what, if any, actions are required for the remaining sites

Another method established to help manage financial risk associated with contaminated oil and gas sites is the Orphan Sites Reclamation Fund (Orphan Fund). Sites for which an owner (both current and historical) cannot be found and held responsible for site clean-up are declared, "Orphan Sites." Beginning in April 2006, a levy on oil and gas production has been collected from operators for the Orphan Fund by the Mineral, Oil and Gas Revenue Branch in the Ministry of Finance. The levy currently generates about $900,000 per year for the fund and the fund's net assets balance at March 31, 2009, was $2.6 million. The Orphan Fund is intended to be used by OGC as a last resort to insulate the Province from this potential risk.

Information about environmental and financial risks and the procedures to oversee them need improving

So far, British Columbia has a relatively small orphan well population. The OGC reported that there are 38 orphan wells out of a total drilled well population of over 20,400. Twenty-four of those wells were drilled prior to 1953 and are located primarily in southeast British Columbia. They are being investigated to determine if any further restoration action is needed. The other 14 orphan wells are in northeast British Columbia and government is funding their restoration. To date, more than $2.0 million has been spent on them.

The OGC reports that most orphan wells have been left by very junior companies that gained entry to British Columbia before 1992, the year when a deposit assessment process started. The OGC also reports that the vast majority of wells in the province are operated by large companies with adequate assets to meet their site restoration responsibilities. Still, risks remain where junior companies operate in the province.

The OGC plans its operations assuming that it will need to restore four to five orphan sites per annum at a cost of $200,000 each. However, as Exhibit 2 shows, one operator's activities can result in several orphan wells that would significantly deplete the fund's net assets. This indicates how important it is for OGC to oversee the risk of operators becoming insolvent and leaving orphan wells to be cleaned up by the OGC.

We recommend that the OGC complete its assessments of the remaining orphan wells and, where appropriate, complete their restoration.

Exhibit 2

Orphan well restoration spending to date for one operator ($000)

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Total
Spending to date	$232	$296	$308	$89	$134	$56	$100	$106	$54	$339	$1,714

Source: BC Oil and Gas Commission

Accountability reporting to legislators and the public needs improving

Reporting on program results is an important component of the provincial government's accountability framework. Reporting on results requires that information systems be in place so that key aspects of program success can be accurately recorded and reported on. Gathered over time, these results provide important management information about whether programs are having the desired effect and where adjustments should be made. Reporting on results also fulfills government's accountability obligations to the Legislature and the public by demonstrating how dollars have been spent.

We had expected to find that the OGC was:

- gathering adequate information on the results of its site contamination oversight; and
- reporting this information to legislators and the public.

Better information about oversight results and more transparent reporting to the Legislature and public is needed.

Better information about site contamination oversight results is needed

We found that the information collected to oversee site contamination risks needs improving. The OGC conducts a number of activities that contribute to the oversight of site contamination risks but it does not report on the results of this work. For example, assessing security deposits and estimating restoration costs are activities where performance measures would provide useful information.

With regard to the site restoration procedures for upstream oil and gas sites, OGC could also measure and report the:

- percentage of inactive upstream oil and gas well sites with Certificates of Restoration; and
- percentage of randomly selected upstream oil and gas well sites with Certificates of Restoration that pass audit.

Accountability reporting to legislators and the public needs improving

More transparent reporting to the Legislature and the public on the OGC's oversight of site contamination risks is needed

The Legislature and the public require transparent reporting on OGC's oversight of site contamination risks. This includes providing a clear picture of operators' compliance with regulatory requirements, the significance of non-compliance risks, whether the deficiencies relate to a risk of site contamination and whether the deficiencies have been corrected.

We found that the OGC is providing some information to the Legislature and public through its website, information sessions and its involvement in the Northeast Energy and Mines Advisory Committee. However, the information provided does not fully inform the Legislature and public about how effectively site contamination risks are being managed through oversight activities.

In its 2007/08 Annual Report, the OGC reports on major compliance rates observed during its inspections of operators' exploration and development activities. A number of parameters involving equipment, environmental issues and drilling and servicing operations are checked during each inspection and the rates reflect the total number of individual inspection parameters found to be in compliance, as a percentage of an estimate of the total number of such parameters across all sites inspected. The OGC Annual Report shows a compliance rate of 98%.

We found that the reported compliance rate is deficient for two main reasons. First, it represents the state of compliance after operators have taken steps within the prescribed time period to correct deficiencies found during OGC inspections. The initial rate of compliance before corrections are made is not reported. Second, the OGC was unable to confirm how many inspection parameters checked related to site contamination risks. This is because the detailed results of inspections are documented but are not summarized for reporting purposes.

The Annual Report also identifies that 4,426 site inspections were carried out during the period. For each inspection, OGC classified the deficiencies found into three categories:

- **serious deficiency** — a regulation or requirement not addressed that is causing or may cause a significant impact on the public and/or environment.

- **major deficiency** — a regulation or requirement not addressed that has the potential to cause an adverse impact on the public and/or environment.
- **minor deficiency** — a regulation or requirement not addressed that does not result in a direct threat to the public and/or environment and does not adversely affect oil and gas operations.

We found, however, that the OGC does not report publicly on how many of the sites had at least one deficiency nor the number of inspections that involved a serious or major deficiency that had the potential to cause an adverse impact on the public, the environment or both. The OGC informed us that they have taken steps to address the reliability of this data for reporting purposes.

To be transparent and accountable, it is important for OCG to improve its information collection system and public reporting. Information such as: the general compliance rate; the statistics before and after deficiencies have been corrected; the significance of non-compliance; the degree to which the non-compliance relates to site contamination and other categories of significant deficiencies; and whether the deficiencies have been rectified, demonstrate transparency and accountability and are important to the Legislature and the public.

We recommend that the OGC improve reporting to the Legislature and public about how effectively site contamination risks are being managed.