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Report of the Commissioner of the Environment and Sustainable Development

CHAPTER 2

Environmental Monitoring of Oil Sands

OAG

Office of the Auditor General of Canada

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CHAPTER 2

Environmental Monitoring of Oil Sands

Performance audit reports

This report presents the results of a performance audit conducted by the Office of the Auditor General of Canada under the authority of the *Auditor General Act*.

A performance audit is an independent, objective, and systematic assessment of how well government is managing its activities, responsibilities, and resources. Audit topics are selected based on their significance. While the Office may comment on policy implementation in a performance audit, it does not comment on the merits of a policy.

Performance audits are planned, performed, and reported in accordance with professional auditing standards and Office policies. They are conducted by qualified auditors who

- establish audit objectives and criteria for the assessment of performance,
- gather the evidence necessary to assess performance against the criteria,
- report both positive and negative findings,
- conclude against the established audit objectives, and
- make recommendations for improvement when there are significant differences between criteria and assessed performance.

Performance audits contribute to a public service that is ethical and effective and a government that is accountable to Parliament and Canadians.

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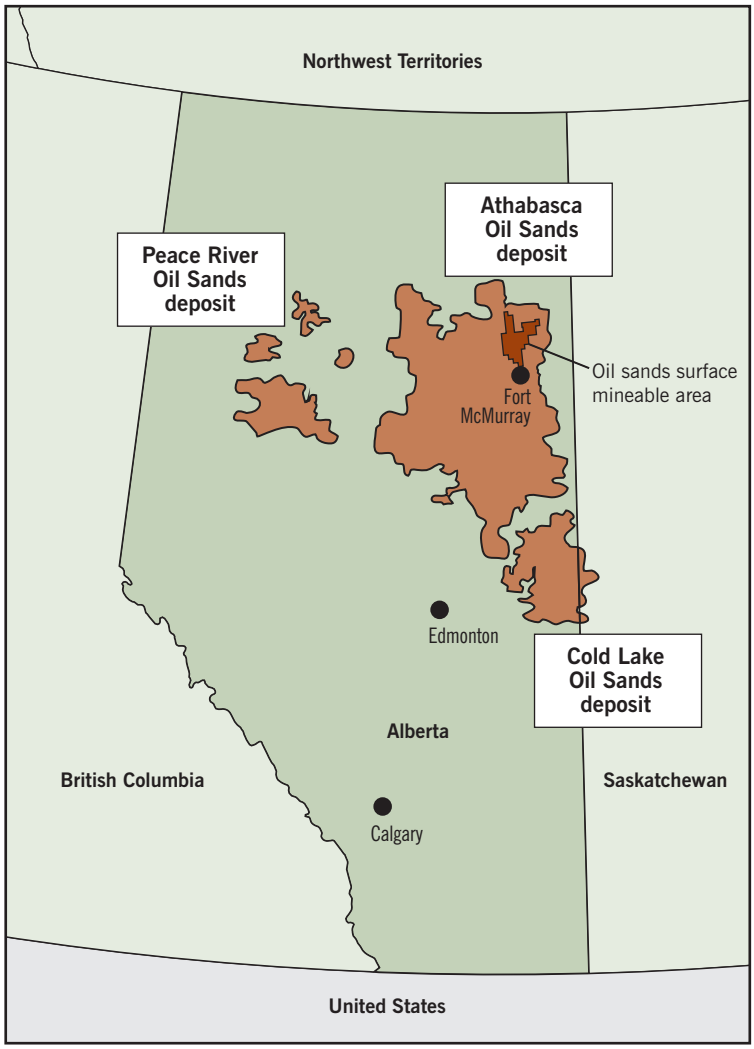
Introduction

The importance of Canada's oil sands

Oil sands surface mining operation

2.1 Alberta's oil sands are a strategic natural resource and a key driver of economic development for Canada. The oil sands cover roughly 142,200 square kilometres in the Athabasca River, Cold Lake, and Peace River regions of the province—about the size of Prince Edward Island, Nova Scotia, and New Brunswick combined (Exhibit 2.1). The first large-scale oil sands commercial operation began in 1967. According to the provincial ministry Alberta Energy, as of July 2014, 132 oil sands projects were operating in Alberta.

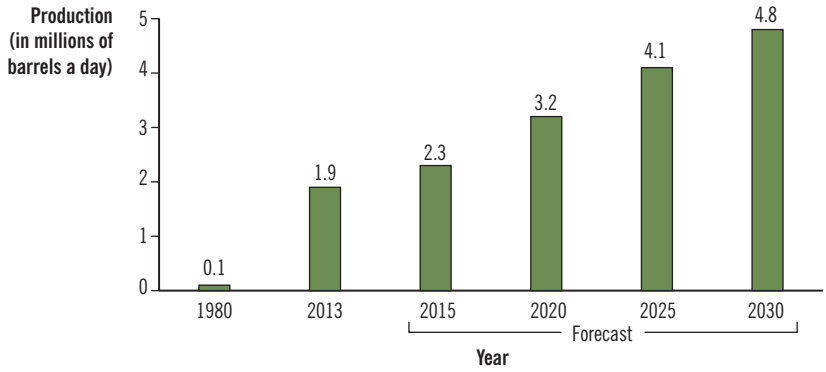
Exhibit 2.1 Canada's oil sands



Source: Adapted by the OAG from various publicly available maps.

2.2 Oil sands production in Alberta has grown substantially since the 1980s. According to the Canadian Association of Petroleum Producers, by 2030 future advancements in extraction approaches and market conditions could ultimately increase oil sands production by two and a half times, from 1.9 to 4.8 million barrels a day (Exhibit 2.2).

Exhibit 2.2 Growth in oil sands production



Source: Data from the Canadian Association of Petroleum Producers

2.3 According to The Conference Board of Canada, in 2012 the oil sands industry employed an estimated 420,000 people in Canada, or the equivalent of 2.4 percent of total employment. Based on forecasts for production and investment in the oil sands, that figure is expected to increase to more than 700,000 by 2030. According to the Canadian Association of Petroleum Producers, industry revenues were $49.3 billion in 2011.

Environmental monitoring of oil sands

2.4 Environmental monitoring systems provide scientific information about the relationship between human activity and the environment by systematically measuring key environmental indicators over time. Monitoring information is important because it can be used to

- assess ecosystem health, identify stressors, and provide early warning of environmental damage and potential impacts on human health;
- assess compliance with regulatory requirements and standards;
- verify the effectiveness of prevention, remediation, and mitigation measures;
- inform decision making and policy development including decisions about future resource development; and
- inform environmental assessments.

2.5 A wide range of monitoring programs and research activities exists in the oil sands region involving many players, including the provincial and federal governments, industry, universities, and First Nations and Métis communities.

2.6 In 2010 and 2011, the governments of Canada and Alberta commissioned independent reviews of the adequacy of oil sands monitoring. These reviews were prompted by growing concerns domestically and internationally about the environmental impact of the oil sands and conflicting scientific opinions regarding their impact. The reviews identified significant shortcomings in oil sands monitoring (Exhibit 2.3).

Exhibit 2.3 Government reviews of oil sands environmental monitoring

December 2010—Federal Oil Sands Advisory Panel report

The Minister of the Environment appointed an independent Oil Sands Advisory Panel in September 2010 to determine whether Canadians have a state-of-the-art monitoring system in the oil sands. Concluding that such a system was not in place, the Panel recommended that relevant jurisdictions and stakeholders together develop a shared national vision and management framework of aligned priorities, policies, and programs.

The Minister of the Environment accepted the Panel's report and committed to moving quickly to put in place a world-class system for monitoring the environmental effects of oil sands development.

March 2011—Alberta Water Monitoring Review Data Committee report

This expert committee, formed by the Alberta Minister of the Environment, was tasked with reviewing the data and conclusions of selected water monitoring studies related to the oil sands. The Committee found that while each of the studies it looked at had presented some useful information, each study had some limitations. The Committee made a number of recommendations to improve the quality and scientific rigour of water quality monitoring programs.

June 2011—Alberta Environmental Monitoring Working Group report

A key recommendation of the Working Group was the creation of an independent monitoring commission to operate at arm's length from government, regulators, and those being regulated. The commission would be responsible for the strategic direction, scientific focus, and ongoing operation of the proposed environmental monitoring system. The Alberta Minister of the Environment committed to establishing the monitoring commission.

2.7 In response to the Federal Oil Sands Advisory Panel report, between March and July 2011, Environment Canada, in collaboration with a range of scientific experts, developed plans for the enhanced monitoring of water, air quality, and biodiversity. These plans provide the technical details on what should be monitored, where, when, and how. The plans provide the basis for the Department's 2011 Integrated Oil Sands Environment Monitoring Plan. This plan was peer reviewed by experts who concluded that it was technically sound.

However, experts also noted that its timely implementation would determine whether it would succeed or fail to generate the data needed to help ensure that the oil sands are being developed responsibly.

Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring

2.8 In February 2012, the governments of Canada and Alberta committed to establishing a joint monitoring program for the oil sands. The program aims to enhance understanding of cumulative effects and environmental change related to oil sands development. It also aims to guide environmentally responsible development of the resource.

2.9 The Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring (the Joint Plan) outlines how the two governments will work together as partners to improve monitoring of air, water, and biodiversity (including wildlife toxicology and habitat disturbance) over three years (2012 to 2015). The Joint Plan is based on the 2011 monitoring plans developed by Environment Canada and is to be implemented by 31 March 2015 at an annual cost of up to $50 million, funded by industry. According to Environment Canada this funding represents a net annual increase of up to $35 million in oil sands monitoring, as industry had been spending between $15 and $20 million a year on oil sands monitoring prior to the Joint Plan.

2.10 The objectives of the Joint Plan are to

- support sound decision-making by governments and stakeholders;
- ensure transparency through accessible, comparable, and quality-assured data;
- enhance science-based monitoring for improved characterization of the state of the environment and collect the information necessary to understand cumulative effects;
- improve analysis of existing monitoring data to better understand historical baselines and changes; and
- reflect the transboundary nature of oil sands development and promote collaboration with the governments of Saskatchewan and the Northwest Territories.

2.11 The Joint Plan outlines how the governments will work together to establish the monitoring program. The approaches outlined in the Joint Plan include

- integrating monitoring arrangements into a single, government-led program;
- engaging industry, scientists, Aboriginal peoples, and other stakeholders in the Joint Plan and developing ways to incorporate their advice on an ongoing basis;
- developing and applying standardized procedures for quality assurance and quality control and standard operating protocols to ensure consistency and the ability to integrate data;
- providing information to the public in a timely, standardized, and coordinated manner;
- adapting monitoring activities to reflect experience gained from the initial work and discussions with industry and stakeholders; and,
- reporting annually on implementation status.

2.12 In addition, the Joint Plan is to be delivered based on the principle of including **Traditional Ecological Knowledge**, and training and involving members of local communities in monitoring activities.

Traditional Ecological Knowledge (TEK)—A cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living things (including humans) with one another and their environment. It includes the knowledge of elders, current land users, and other community members. Traditional knowledge is an attribute of societies with historical continuity in resource use practices.

Source: Aboriginal Affairs and Northern Development Canada

2.13 Environmental monitoring under the Joint Plan aims to improve understanding of the long-term cumulative effects of oil sands development by

- increasing the number of sampling sites and covering a larger area;
- increasing the number and types of parameters being monitored (such as the number and types of contaminants related to oil sands development);
- increasing the frequency of sampling;
- improving the methodologies for monitoring both air and water; and
- creating an integrated, open data management program.

2.14 The Joint Plan includes monitoring to better understand cumulative effects associated with oil sands development; it does not include monitoring of facility performance to ensure that facilities remain compliant with regulatory requirements.

2.15 The Joint Plan does not include monitoring human health effects and greenhouse gas emissions from industrial facilities in the oil sands region. However, the Government of Alberta collects greenhouse gas emissions information for selected facilities and submits the information to Environment Canada. As well, although monitoring

wetlands and deep groundwater was not originally part of the Joint Plan, in 2014–15 efforts began to develop a monitoring proposal for both. Initial efforts under the Joint Plan have focused on monitoring in the surface mineable oil sands area with limited monitoring of the Peace River and Cold Lake oil sands deposits.

2.16 The federal Minister of the Environment and the Minister of Alberta Environment and Sustainable Resource Development (ESRD) are responsible for implementing the Joint Plan. In December 2013, the Government of Alberta established the Alberta Environmental Monitoring, Evaluation and Reporting Agency. The role of the Agency is to coordinate province-wide environmental monitoring, evaluation, and reporting. The Agency became operational in April 2014 and is taking over from ESRD in leading the province's involvement in the Joint Plan with the federal government, to coordinate and enhance environmental monitoring in the oil sands region.

Previous audits

2.17 In 2010 and 2011, the Commissioner of the Environment and Sustainable Development issued two reports with findings related to oil sands monitoring (December 2010, Chapter 2, Monitoring Water Resources and October 2011, Chapter 2, Assessing Cumulative Environmental Effects of Oil Sand Projects). The audits found that baselines and monitoring data necessary for understanding changing environmental conditions in northern Alberta were incomplete. The 2011 audit found that the incomplete baselines and monitoring data hindered the federal government's ability to consider cumulative environmental effects as part of environmental assessments of oil sands projects in that region.

Focus of the audit

2.18 The objective of this audit was to determine whether Environment Canada implemented its responsibilities under the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring according to established timelines and budgets, and the objectives and approaches set out in the Joint Plan.

2.19 We examined Environment Canada's activities since February 2012, when the governments of Canada and Alberta committed to establish an oil sands environmental monitoring program under the Joint Plan. The audit focused on the Department's implementation of work plans for the 2013–14 fiscal year and on the

development of work plans for the 2014–15 fiscal year. The audit covered the period between February 2012 and April 2014.

2.20 More details about the audit objectives, scope, approach, and criteria are in **About the Audit** at the end of this chapter.

Observations and Recommendations

Planning

2.21 Overall we found that, under the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring (the Joint Plan), work plans identified Environment Canada's responsibilities and included budgets and timelines for deliverables. In light of the complexity and costs associated with establishing a comprehensive monitoring program for the oil sands, concrete work plans make it more likely that the program will achieve its objectives. We also found that further efforts are needed to meet commitments to engage stakeholders, including First Nations and Métis, and incorporate Traditional Ecological Knowledge into the Department's monitoring activities. Effective stakeholder engagement is critical to the monitoring program's relevance, credibility, implementation, and operation.

Work plans identify responsibilities and include budgets and timelines for deliverables

2.22 Concrete work plans enhance the likelihood of realizing program objectives. Such plans identify roles and responsibilities as well as the timelines and resources required. Sufficiently detailed work plans also provide the basis for effective oversight and tracking of progress. We examined whether work plans defined Environment Canada's roles and responsibilities, and included deliverables, timelines, and budgets.

2.23 **Roles and responsibilities.** Under the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring, Environment Canada and Alberta's Ministry of Environment and Sustainable Resource Development (ESRD) committed to implementing a range of activities to enhance air, water, and biodiversity monitoring in the oil sands region. Given that these monitoring activities also involve independent monitoring organizations, the Joint Plan's success depends in part upon defining who is responsible for what activity.

2.24 We found that annual work plans were developed to guide the implementation of the monitoring activities in the Joint Plan. We reviewed the 2013–14 and 2014–15 work plans to determine whether Environment Canada identified its roles and responsibilities for air,

water, and biodiversity monitoring activities. We found that the work plans clearly identified the monitoring activities that Environment Canada was responsible for implementing.

2.25 Environment Canada plays an important role in implementing the Joint Plan. In the 2013–14 fiscal year, Environment Canada led 38 of the 58 projects for air, water, and biodiversity monitoring. The Department spent approximately $24.6 million on these projects in the 2013–14 fiscal year—and cost-recovered about $18.1 million of this amount from industry. Environment Canada's net contribution to these projects was therefore about $6.5 million (Exhibit 2.4). The Department is the sole recipient of funding for projects under the biodiversity–wildlife toxicology component of the Joint Plan.

Exhibit 2.4 Environment Canada recovered $18.1 million from industry for oil sands monitoring activities in the 2013–14 fiscal year

Monitoring component	Number of Environment Canada projects	2013–14 Expenditures (millions of dollars)	
		Cost-recovered from industry	Environment Canada's contribution
Air	13	$4.5	$2.3
Water	16	$11.5	$3.3
Biodiversity—Wildlife toxicology	5	$1.0	$0.6
Biodiversity—Habitat disturbance	4	$1.1	$0.3
Total	**38**	**$18.1**	**$6.5**

2.26 **Deliverables, timelines and budgets.** We reviewed projects and related work plans that Environment Canada was responsible for implementing in the 2013–14 and 2014–15 fiscal years to determine whether the Department had specified the activities and outputs it would undertake. We also looked at whether it had established the timelines and budgets required for implementing these activities and outputs. We found that almost all of the Department's project work plans included clear and concrete deliverables, as well as timelines for implementation and overall budgets for each project, providing the basis for oversight and monitoring of progress.

Further efforts are needed to meet commitments to engage stakeholders

2.27 Under the Joint Plan, Environment Canada and Alberta's ESRD committed to engaging with industry, independent scientists, Aboriginal peoples, and other stakeholders in the Joint Plan and on appropriate ways to incorporate their advice. This engagement was to

begin early in the implementation process and continue throughout its duration. Effective stakeholder engagement is critical to the relevance, credibility, and successful implementation and operation of the monitoring program. We examined whether Environment Canada engaged stakeholders and considered their input in the development of the work plans for the projects they were responsible for carrying out.

2.28 **Consideration of stakeholder input in work planning.** We found that stakeholders were engaged in the development of the 2012–13 and 2013–14 work plans. Consultation occurred with senior officials from Environment Canada and Alberta's ESRD and a range of stakeholders through a multi-stakeholder forum in May 2012. Discussions also occurred with monitoring organizations. However, input from stakeholders was not consistently documented and it was not always clear how the input was considered in the development of work plans.

2.29 Stakeholder engagement was formalized for the development of the 2014–15 work plans through the creation of component advisory committees covering air, water, and biodiversity (including wildlife toxicology and habitat disturbance). The mandate of these committees was to consider current monitoring, recommend annual monitoring activities to achieve the long-term goals and objectives of the Joint Plan, and strengthen monitoring activities. The advisory committees were also tasked with identifying gaps in the existing monitoring objectives for potential consideration. Membership included representatives from First Nations and Métis communities, industry, non-government organizations, academia, and in some cases other government departments.

2.30 Although the creation of these advisory committees represents an improvement in the engagement process, stakeholders had a number of concerns with the role and purpose of the committees. Concerns also related to how participants were selected, how their input was considered in developing the work plans, and differences in how the committees operated across the monitoring components. In our opinion it is important that these concerns are addressed to ensure that stakeholder engagement is effective and meaningful.

2.31 **First Nations and Métis.** The engagement of Aboriginal peoples is a key commitment made by the governments under the Joint Plan. Between October 2013 and May 2014, five First Nations and Métis communities withdrew from the engagement process. They cited a number of reasons for withdrawing, such as concerns with the engagement process, limited incorporation of Traditional Ecological

Knowledge (see paragraphs 2.33 to 2.35), lack of consideration of human health aspects in the monitoring activities, and lack of financial support for their participation in the Joint Plan.

2.32 While some First Nations and Métis communities were engaged in the component advisory committees, further efforts are needed to meet the Joint Plan commitment. Environment Canada officials informed us that they have been working in partnership with Alberta's ESRD and Aboriginal communities to better understand their concerns and to develop appropriate ways to achieve meaningful engagement. At the time of the audit, discussions were ongoing. Our recommendation is found at paragraph 2.51.

Integration of Traditional Ecological Knowledge into Environment Canada's monitoring activities is limited

2.33 The Joint Plan is to be delivered based on the principle of inclusion of Traditional Ecological Knowledge (TEK). According to Environment Canada, TEK is a recognized knowledge system that complements western science, provides important context to scientific work, and can increase the efficiency of monitoring activities (for example, by using TEK to identify appropriate monitoring sites). The Department acknowledges that engaging First Nations and Métis communities and considering TEK contributes to the acceptability and legitimacy of monitoring activities by addressing the perspectives, issues, and priorities of these communities. A prime concern for some Aboriginal communities has been the lack of progress in incorporating TEK into Joint Plan monitoring.

2.34 We examined whether Environment Canada incorporated TEK into the projects from the 2013–14 work plans that it is responsible for. We found limited integration of TEK in the Department's monitoring projects. Across the Department's 38 monitoring projects, 3 incorporated TEK. For example, a First Nation community contributed traditional knowledge to the selection of sites in the Peace-Athabasca Delta and to the collection of snowpack samples for monitoring airborne contaminants.

2.35 To date Environment Canada has not met its commitment to incorporate TEK into its monitoring projects. Without a mutually agreeable approach to consider input from Aboriginal peoples on traditional knowledge, opportunities will continue to be missed. Our recommendation is found at paragraph 2.51.

Implementing monitoring projects

2.36 Overall, we found that Environment Canada implemented most of the projects we examined according to established timelines. We also found that the Department is in the early stages of integrating monitoring results across air, water and biodiversity. Integration is important for understanding cumulative environmental effects of oil sands development.

Most projects we examined are being implemented according to schedule

Environment Canada scientists sampling water at the Ells River

2.37 To determine the status of implementation of Environment Canada's projects, we examined whether the Department carried out selected activities in the 2013–14 work plans according to timelines and budgets. We also examined whether the Department had established procedures for quality assurance and control and standard operating protocols for these projects. We selected a sample of 9 of the 38 projects from the 2013–14 work plans that Environment Canada was responsible for carrying out across the monitoring components. These projects represent about 45 percent or approximately $8 million of the Department's cost-recovered monitoring expenditures of $18.1 million in 2013–14. We selected our sample in consultation with the Department, based on factors such as the project's significance to the success of the monitoring component and the dollar value (Exhibit 2.5).

2.38 **Timelines.** Overall, we found that the nine projects we examined had made reasonable progress in implementing the activities they planned for the 2013–14 fiscal year. Of the nine projects, we found that five had implemented their planned activities according to established timelines, while the remaining four projects experienced some delays. A number of factors contributed to these delays such as insufficient staff, delays in establishing contracts with laboratories, and difficulties in obtaining leases or permits for establishing monitoring sites.

2.39 Environment Canada informed us that it is working to address some of these factors. For example, the Department has finalized a contract with a laboratory to analyze **polycyclic aromatic hydrocarbons** in water. Environment Canada also informed us that it needs to prioritize which water samples it collected would be analyzed by 31 March 2015.

Polycyclic aromatic hydrocarbons—A class of compounds produced through any incomplete combustion of organic matter. These compounds can enter the environment from natural events such as forest fires, and from human activities such as the burning of fossil fuels.

Exhibit 2.5 Projects led by Environment Canada that we examined

Component	Project	Objective
Air	Monitoring Oil Sands Air Pollution Emission, Transformation, and Transport	To characterize, quantify, and validate the physical and chemical processes governing emission, transport, transformation, and deposition* of pollutants. The data is intended to help researchers assess the cumulative impacts of pollutants on ecosystems. The project will be conducted through a series of short-term intensive measurement campaigns designed to validate emission, transformation, and deposition used in models and for cumulative impact assessment.
	Canadian Air and Precipitation Monitoring Network Ecosystem/Long Range Transport/Transboundary Transport Sites	To accelerate the installation, operation, and collection of data from a network of sites in western Canada, providing the necessary wet and dry deposition data downwind and upwind of the oil sands region.
	Ecosystem Exposure Monitoring: Enhanced Deposition Study—Polycyclic Aromatic Compounds Active and Passive Sampling Pilot Project	To estimate the atmospheric deposition of selected organic and inorganic pollutants in the Athabasca oil sands region. The study comprises a three-year pilot phase that started in the fall of 2010 and that will then transition to longer term aspects under various linked projects.
Water	Mainstem Water Quality	To implement a long-term water quality monitoring program on the Athabasca mainstem (core river body) by analyzing a range of contaminants and over 70 parameters, including organic and inorganic compounds, nutrients, and metals, including mercury.
	Tributary Benthic Invertebrate Monitoring	To assess the benthic invertebrates (insects living in or on the bottom sediments of rivers) of the tributaries of the Lower Athabasca River. It also includes the collection of benthic algae, water quality parameters, and contaminants.
	Atmospheric Deposition to Lakes and Snowpack	To measure contaminant concentrations from atmospheric deposition in snowpack around oil sands development and in small lakes within 100 km of major mining and processing facilities. The project analyzes sediment cores from lake bottoms, a technique known as paleo-coring.
Biodiversity—Wildlife toxicology and contaminants	Colonial Water Bird Health and Contaminants	To monitor contaminant concentrations (for example, heavy metals such as mercury) in aquatic bird eggs to help assess the impact of oil sands development. By extension, the project looks at the health of the ecosystem, since mercury levels in bird eggs are related to mercury levels in the water, air, fish, and other animals in the area where they live and feed.
	Hunter/Trapper Harvested Wildlife Contaminants and Toxicology	To analyze tissue samples from animals in low and high impacted sites in the oil sands region to measure environmental contaminants in wildlife over time.
Biodiversity—Habitat disturbance	Species at Risk and Rare/Difficult Species Monitoring	To ensure that gaps in trend monitoring programs for migratory land birds are identified and additional monitoring is implemented to detect population change, particularly for species at risk, rare species, and species that are difficult to monitor.

*Deposition—Pollutants in the atmosphere that are either deposited by rain or snow (wet deposition) or that are deposited on, or absorbed into, surfaces (dry deposition).

2.40 **Budgets.** As part of our audit, we examined Environment Canada's cost-recovered expenditures for the fiscal year 2013–14 by comparing project spending to the project budgets. The budget for one of the projects in our sample was merged with another project that we did not examine, therefore our observations are based on the eight remaining projects. Despite significant variances between the planned budgets and expenditures for some of these projects, we found that the eight projects, taken together, were within the overall budget. We did not audit the quality of the Department's financial information.

2.41 **Quality assurance, quality control, and standard operating protocols.** Standardized quality assurance and quality control procedures and standard operating protocols are essential for ensuring consistency and the ability to integrate data. We examined whether the Department had established these procedures and protocols for the nine projects we selected. We found that quality assurance and quality control procedures and standard operating protocols had been established for the nine projects we examined. We did not assess the quality of the Department's monitoring data or the application of these procedures and protocols.

Environment Canada is in the early stages of integrating monitoring results across air, water, and biodiversity components

2.42 According to Environment Canada and Alberta's Ministry of Environment and Sustainable Resource Development (ESRD), to understand the long-term environmental effects—including cumulative effects—of oil sands development, scientific questions must be asked to find out what impact contaminants or disturbances have on all components (air, water, and biodiversity). In answering these questions, a more complete picture of the environmental effects of oil sands development begins to emerge. Integrating information is important for ensuring the most complete picture of environmental effects possible.

2.43 Environment Canada and Alberta's ESRD recognize that the integration of air, water, and biodiversity monitoring is fundamental to the success of the Joint Plan and also important for understanding cumulative effects. Stakeholders have raised concerns about the lack of integration across components. We examined whether the Department had developed a strategy for integrating monitoring information across the monitoring components of air, water, and biodiversity.

2.44 We found that the Department has taken initial steps to integrate monitoring information across the monitoring components for two substances. The Department identified the preliminary results of its projects that monitor mercury and polycyclic aromatic hydrocarbons/polycyclic aromatic compounds across air, water, and biodiversity components. According to the Department several years of data are required before integration can begin. However, we found that a strategy to guide how monitoring information will be integrated has not been developed.

2.45 As monitoring results become available, continued integration of monitoring information across air, water, and biodiversity components will be required for understanding cumulative environmental effects and to support sound decision-making. Our recommendation is found at paragraph 2.51.

Annual reporting has not been timely

2.46 Under the Joint Plan, the federal and Alberta governments committed to maximize transparency by reporting annually to the public on the Plan's implementation status. When we examined whether these reports had been produced, we found that the annual report for the 2012–13 fiscal year had been released in June 2014, 15 months after the end of the fiscal year (31 March 2013). We note that a release schedule for annual reports has not been established. Timely annual reporting is important for accountability and the credibility of monitoring under the Joint Plan. Our recommendation is found at paragraph 2.51.

Determining future roles

2.47 Although Environment Canada currently plays an important role in oil sands monitoring, we found that its involvement in monitoring after 31 March 2015 is not clear. This finding is important because work remains to fully implement the Joint Plan, ranging from engaging First Nations and Métis to incorporating Traditional Ecological Knowledge to integrating monitoring information across the air, water, and biodiversity components. If Environment Canada is to fulfill its monitoring responsibilities under the Joint Plan, it is important that the Department allocate the resources necessary to complete its remaining work.

The Department's post-2015 role in oil sands monitoring is unclear

2.48 Establishing a comprehensive program for monitoring the cumulative effects of oil sands development, as envisioned in the Joint Plan, is a complex and long-term undertaking. Joint Plan monitoring activities are expected to be implemented by 31 March 2015. Despite this approaching deadline, work remains to fully implement the Joint Plan, ranging from engaging First Nations and Métis to incorporating Traditional Ecological Knowledge to integrating monitoring results across the air, water, and biodiversity components.

2.49 Under the Joint Plan, Environment Canada plays an important role in monitoring and contributes extensive scientific expertise to monitoring the oil sands. Given that work remains to be done to implement the Joint Plan, it is important that the Department's future role in oil sands monitoring be clear in relation to the Alberta Environmental Monitoring, Evaluation and Reporting Agency. Clarifying the Department's role is important so that it can allocate the resources necessary to fulfill its monitoring responsibilities under the Joint Plan. However, we found that the Department's role in oil sands monitoring after 31 March 2015 has not yet been determined. Stakeholders we consulted told us that Environment Canada's continued involvement was important to the success of monitoring the environmental effects of oil sands development.

2.50 **Recommendation.** Environment Canada, in partnership with the Alberta Environmental Monitoring, Evaluation and Reporting Agency, should identify potential options to build on the foundation of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring, to have a world-class monitoring program past 2015, with due consideration for the extent and nature of the Department's future involvement.

Department's response. Agreed. Environment Canada will work with the Alberta Environmental Monitoring, Evaluation and Reporting Agency to develop options that build on the foundation of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring, to have a world-class monitoring program past 2015, including the extent and nature of Environment Canada's future involvement.

2.51 **Recommendation.** Environment Canada, in consultation with the Alberta Environmental Monitoring, Evaluation and Reporting Agency, should:

- work with First Nations and Métis communities to develop an engagement approach and to integrate Traditional Ecological Knowledge into the monitoring of oil sands;
- develop a strategy for integrating monitoring data across air, water, and biodiversity components; and
- issue annual reports on progress in implementing the Joint Plan according to an established release schedule.

Department's response. Agreed. The Department agrees with this recommendation, noting that achieving these goals requires close collaboration with, and agreement from, the Alberta Environmental Monitoring, Evaluation and Reporting Agency.

The Department, in cooperation with the Agency, has already developed a revised Aboriginal engagement process based on the original engagement experience and feedback received from First Nations and Métis communities. This revised process was presented to First Nations and Métis representatives in May and June 2014 and proposes to expand Aboriginal influence in setting monitoring objectives and to fund some Aboriginal engagement and participation. It also proposes more opportunities for the identification and effective inclusion of Traditional Ecological Knowledge in monitoring.

The Department has begun integrating results of monitoring in different components, as acknowledged in paragraph 2.44. Learning from this experience, additional data and feedback from stakeholders will inform a more formalized integration strategy.

A regular release schedule will be established for annual progress reports starting in 2015–16 now that the Agency has been established.

Conclusion

2.52 The oil sands are an important natural resource providing significant economic benefits to Canada. Given the rapid expansion and projected growth of oil sands development, a comprehensive understanding of its impact is critical to responsibly manage this resource and demonstrate this understanding to domestic and international stakeholders. If successfully implemented, the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring (the Joint Plan) will provide a foundation for understanding the impact of the oil sands development on the environment, including cumulative effects. It will also provide governments with information to responsibly manage the oil sands.

2.53 We conclude that Environment Canada has implemented most of the projects we examined according to their 2013–14 timelines and budgets. The Department has also established quality assurance and quality control procedures and standard operating protocols for each examined project.

2.54 However, we conclude that Environment Canada has not met some important Joint Plan commitments. Specifically, further efforts are needed to meet commitments to engage stakeholders, including First Nations and Métis, and incorporate Traditional Ecological Knowledge into its monitoring activities. While initial steps have been taken to integrate monitoring results across air, water, and biodiversity components, further work remains to be done to understand cumulative environmental effects of oil sands development. Although Environment Canada plays an important role in current monitoring, its future role in oil sands monitoring after 31 March 2015 has not been decided.

About the Audit

The Office of the Auditor General's responsibility was to conduct an independent examination of Environment Canada's implementation of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring to provide objective information, advice, and assurance to assist Parliament in its scrutiny of the government's management of resources and programs.

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (CPA) in the CPA Canada Handbook—Assurance. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

As part of our regular audit process, we obtained management's confirmation that the findings reported in this chapter are factually based.

Objective

The objective of the audit was to determine whether Environment Canada has implemented the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring (the Joint Plan) according to established timelines and budgets, and the objectives and approaches set out in the Joint Plan.

Scope and approach

The audit focused on Environment Canada's responsibilities under the Joint Plan. The audit team examined whether

- the Department has identified its roles and responsibilities for monitoring air, water, and biodiversity components under the Joint Plan;
- work plans for implementing these components included clear and concrete deliverables, considered input from stakeholders and Traditional Ecological Knowledge, and had a budget and a timeline for implementation; and
- the Department implemented selected activities and outputs of the work plans that it is responsible for, according to established quality assurance and quality control procedures and standard operating protocols, timelines, and budgets.

We selected activities in consultation with the Department and based on such factors as the activity's significance to the success of the monitoring component and its dollar value.

Outside the scope of this audit were the scientific adequacy of the approach to oil sands monitoring and the quality of the monitoring data generated by Environment Canada under the Joint Plan. The audit also did not address how the monitoring data was or will be used to fulfill federal legislative and regulatory responsibilities.

Criteria

Criteria	Sources
To determine whether Environment Canada has implemented the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring according to established timelines and budgets and the objectives and approaches set out in the Joint Plan, we used the following criteria:	
Environment Canada has identified its roles and responsibilities for implementing the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.	Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring
Environment Canada has work plans for implementing the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring that include • clear and concrete activities and outputs, • consideration of stakeholder input, • consideration of Traditional Ecological Knowledge, • a budget, and • a timeline for implementation.	
Environment Canada has delivered selected activities and outputs of the work plans according to established quality assurance and quality control procedures and standard operating protocols, timelines, and budgets.	

Management reviewed and accepted the suitability of the criteria used in the audit.

Period covered by the audit

The audit covered the period between February 2012 and April 2014. The audit focused on the implementation of the 2013–14 work plans and on the development of the 2014–15 work plans. Audit work for this chapter was completed on 1 August 2014.

Audit team

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Appendix List of recommendations

The following is a list of recommendations found in Chapter 2. The number in front of the recommendation indicates the paragraph number where it appears in the chapter. The numbers in parentheses indicate the paragraph numbers where the topic is discussed.

Recommendation	Response
Determining future roles	
2.50 Environment Canada, in partnership with the Alberta Environmental Monitoring, Evaluation and Reporting Agency, should identify potential options to build on the foundation of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring, to have a world-class monitoring program past 2015, with due consideration for the extent and nature of the Department's future involvement. **(2.47–2.49)**	Agreed. Environment Canada will work with the Alberta Environmental Monitoring, Evaluation and Reporting Agency to develop options that build on the foundation of the Joint Canada–Alberta Implementation Plan for Oil Sands Monitoring, to have a world-class monitoring program past 2015, including the extent and nature of Environment Canada's future involvement.
2.51 Environment Canada, in consultation with the Alberta Environmental Monitoring, Evaluation and Reporting Agency, should: • work with First Nations and Métis communities to develop an engagement approach and to integrate Traditional Ecological Knowledge into the monitoring of oil sands; • develop a strategy for integrating monitoring data across air, water, and biodiversity components; and • issue annual reports on progress in implementing the Joint Plan according to an established release schedule. **(2.31–2.35; 2.42–2.46)**	Agreed. The Department agrees with this recommendation, noting that achieving these goals requires close collaboration with, and agreement from, the Alberta Environmental Monitoring, Evaluation and Reporting Agency. The Department, in cooperation with the Agency, has already developed a revised Aboriginal engagement process based on the original engagement experience and feedback received from First Nations and Métis communities. This revised process was presented to First Nations and Métis representatives in May and June 2014 and proposes to expand Aboriginal influence in setting monitoring objectives and to fund some Aboriginal engagement and participation. It also proposes more opportunities for the identification and effective inclusion of Traditional Ecological Knowledge in monitoring. The Department has begun integrating results of monitoring in different components, as acknowledged in paragraph 2.44. Learning from this experience, additional data and feedback from stakeholders will inform a more formalized integration strategy. A regular release schedule will be established for annual progress reports starting in 2015–16 now that the Agency has been established.