SUSTAINABILITY 2012
Leader's Letter

In our last sustainability report, we asked the question, “Are the oil sands being responsibly developed?” This year’s report continues the discussion by updating our performance metrics and highlights, further demonstrating our progress towards comprehensive disclosure.

The data shows that with over 4,400 hectares of former mining land either permanently reclaimed or ready for revegetation, we lead the industry in reclamation. We were also recognized as one of Canada’s top 20 spenders on research and development – with over half of our investments focused on reclamation, tailings management and further environmental improvements.

While our safety performance remains among the best in the oil sands industry, injuries still occur and we feel this is not acceptable for a world-leading operation. Toward improved performance, greater emphasis is now being placed on addressing those risks most often overlooked in daily work routines, such as slips, trips and falls.

Ongoing implementation of ExxonMobil’s proprietary Operations Integrity Management System (OIMS) – proven in the world’s leading refinery operations – promises greater reliability and improved performance in addressing safety, security, health, environmental, and social risk. This system will be fully in place by the end of 2013 and is expected to enable meaningful improvements across the board in the years ahead.

We also support the continued evolution of science-based environmental monitoring and welcome the addition of the joint Canada/Alberta oil sands monitoring program, now under implementation. We also support and advocate community health studies as defined and carried out by government authorities.

Syncrude’s sustainability path is a journey on which we can always – and must – improve. In particular, through one-on-one and group discussions with employees, we have heard that the company’s stewardship in the areas of safety, environment and health is essential and expected. Indeed, through their individual initiative and resourcefulness, we are being rewarded with innovative ideas for better performance.

As the demand for energy increases, we will continue to focus on the responsible
development of the oil sands. Our sustainability report will keep you up-to-date on our continued progress and we seek your feedback to ensure we are providing you with the information you need. Please take a few moments to tell us how we are doing. Our on-line survey is available here [link to survey].

In closing, we extend a special thank you to our over 5,000 employees who, each day, are solving our toughest challenges with determination and the desire to make Syncrude the very best at what we do.

Marcel Coutu
Chairman

Scott Sullivan
President and CEO
Sustainability Management Systems

Managing Towards Sustainability

Internal inputs start with Syncrude's Joint Venture owners, who oversee and provide direction to Syncrude's sustainability work through the Board of Directors' Safety, Health, Environment & Corporate Sustainability Committee. At the operational level three key management systems provide the strategy, tools and discipline needed to focus on priority areas. A comprehensive Research and Development program enables innovation and continuous improvement (see research.syncrude.ca). Some aspects of employee compensation are also tied to achievement of sustainability metrics.

External inputs include all applicable laws and regulations, and stakeholder expectations, which are formed in part by the findings of independent environmental monitoring programs. Industry best practices also feed into Syncrude's pursuit of continuous improvement in all aspects of our business. Of these, Syncrude participates in three formal stewardship programs: the Toward Sustainable Mining program of the Mining Association of Canada; the Responsible Canadian Energy program of the Canadian Association of Petroleum Producers; and the Progressive Aboriginal Relations program of the Canadian Council for Aboriginal Business.

Our key SH&E sustainability policy states our expectations for safety, health and environmental performance. Our corporate code of ethics and business conduct policies guide employee actions.

Syncrude's Sustainability Management Framework

Ownership & Management Agreement
The graphic above shows how Syncrude manages its business toward sustainability outcomes.

**Safety, Health and Environment Policy**

At Syncrude we are committed to protecting and promoting the safety and well-being of our employees, our contractors, our communities and our environment.

We believe excellence and continuous improvement in safety, health and environmental performance are in the best interest of all of our stakeholders. Our corporate success depends upon it.

Our desired outcomes are a workplace where everyone upholds Syncrude's Vision, Values and Guiding Principles, a workplace that fosters the emotional and physical well-being of employees, a workplace where incidents that could harm people or the environment do not occur, and a workplace where all employees and contractors demonstrate personal commitment to operational excellence. Toward this:

- **we aim for a safe and reliable operation** where all risks that could compromise the health and safety of workers, or the environment, are identified, understood and managed;
- **we meet all regulated standards** for safety, health and environmental performance as the minimum expectation;
- **we learn from best practices** applied elsewhere and endeavour to incorporate such lessons into our practices and procedures;
- **we integrate safety, health and environment** considerations, along with economic factors, into all business decisions; and
- **Syncrude management takes a leadership role** in advocating workplace health and safety,
and environmental sustainability, in appropriate regional, provincial and national forums.

Through the efforts and collective experience of our employees and contractors, Syncrude will be an acknowledged leader in safety, health and environmental performance. We will continue to improve by working together and sharing responsibility for a healthy environment, as well as the safety and well-being of our co-workers, our families, our communities and ourselves.

**Code of Ethics and Business Conduct**

Syncrude's Code of Ethics and Business Conduct policies are designed to foster the high level of ethical conduct expected by our many internal and external stakeholders. We steward the application of these policies and report to the Board of Directors' Audit and Business Controls Subcommittee and make representations to the Board to confirm compliance.

All employees are formally trained in these matters every four years, most recently in 2010. Training is also done at the time of hiring. All employees must sign a certification stating they understand the policies – Administrative, Professional and Technical employees certify annually based on their increased exposure to potential situations, while Occupational employees certify every four years. All employees receive an annual letter from the President and CEO as a reminder of these policies.

In addition to internal processes, Syncrude has an external system for the reporting of concerns about corporate conduct. Employees, contractors and members of the public may file their concerns anonymously and confidentially through EthicsPoint, or 1-800-493-1866. This information is available internally to all staff and through Syncrude's external website at www.syncrude.com.

**Management Systems**

**Operations Integrity Management System (OIMS)**

Adoption of ExxonMobil's Operations Integrity Management System (OIMS) continues throughout the Syncrude organization. The new system is expected to be fully implemented by the end of 2013. It aims to make the safety of people, facilities and the environment the centre of all decision making. It establishes expectations and requirements for addressing safety, security, health, environmental and social risk.

OIMS consists of 11 elements that address specific aspects of management common to all ExxonMobil operating facilities. From these, supplemental guidelines relevant to Syncrude's operations are being developed.

ExxonMobil reviews the overall effectiveness of OIMS every five years and makes enhancements accordingly. Lloyd's Register Quality Assurance, Inc2. (LRQA) attests that OIMS meets the requirements of the standard for environmental management systems (ISO 14001:2004) and the Occupational Health and Safety Assessment Series for health and safety management systems (OHSAS 18001:2007).

**Global Reliability System**

Syncrude has begun implementing ExxonMobil's Global Reliability System (GRS) to our operations. It is expected to be fully implemented by the end of 2013. GRS is based on the principles of reducing reliability incidents, reducing costs and improving safety. Its 20 elements provide a common framework for work practices and processes, and facilitate best practice sharing across our operations. This allows us to apply developed practices...
Controls Integrity Management System

Syncrude's commitment to conducting business in a well-controlled manner includes establishing effective controls, monitoring and enforcing compliance continuously, and resolving control weaknesses promptly. The Controls Integrity Management System (CIMS) provides a structured, common process for Syncrude to meet this commitment. It is based on the principles and standards in Syncrude's Framework of Management Control and provides the key attributes of an effective control system designed to meet certain regulatory requirements. These controls meet or exceed the requirements of the Sarbanes-Oxley Act in the United States and Bill C-198 in Canada.

Employee Compensation System

Variable incentive pay for Syncrude employees is tied to the achievement of certain corporate metrics, including sustainability factors. The Impact 21 program, for example, rewards employees for achieving targets in safety, production, net production costs and energy utilization. It reinforces to all employees how their contributions are critical to meeting overall sustainability goals. Senior leaders, managers and executives are rewarded based on a broader array of metrics including community relations, business controls, environmental performance and tailings management.

Regulatory Oversight

Syncrude is subject to federal and provincial regulation. These regulations require Syncrude to secure various approvals and provide for restrictions and prohibitions on releases or emissions of various substances produced or used in association with our operation. Legislation also requires that our facilities and sites be reclaimed to the satisfaction of provincial authorities. A violation may result in fines and penalties.

Environmental compliance is primarily governed by the Alberta Environmental Protection and Enhancement Act. It imposes certain environmental responsibilities on Syncrude and, in certain instances, also imposes penalties for violations. Syncrude currently has all approvals required to operate existing facilities.

Additional regulatory oversight was introduced in August 2012 through the approval of the Lower Athabasca Regional Plan. Now being implemented, the plan includes regulations and management frameworks for air, groundwater and surface water quality management. During its development, it considered input from an appointed advisory council, as well as from the public, municipalities, stakeholders, and First Nations and Métis communities in the region.

Environmental Monitoring Programs

Syncrude's sustainability efforts are informed by inputs from a variety of external environmental monitoring programs. These have been subject to much public scrutiny in recent years, with reviews by science leaders and some stakeholders suggesting that more integration, and more and better data, are needed in order to understand and manage ecosystem effects. Work toward this goal continued during the reporting period.

The federal and Alberta governments both appointed expert advisory panels in late 2010 and early 2011, and then came together in February 2012 to announce a joint federal-provincial science-based oil sands emissions monitoring program. It is to be implemented over three years and the estimated $50 million per year cost is to be borne by industry.
The program will more than double to 165 the number of monitoring sites in and downstream/downwind of the oil sands region, including sites in the Northwest Territories and Saskatchewan. It will examine hundreds of contaminants that are not tested under existing programs, increase monitoring frequency and calculate cumulative effects. The program will also incorporate Traditional Ecological Knowledge (TEK) involving local Aboriginal people in monitoring activities. It is to be peer-reviewed regularly and all data and reports are to be made public in a timely way. The Program began in the spring of 2012 and is co-managed by the federal and provincial governments.

Syncrude understands stakeholders expect effective, credible monitoring of our industry and we welcome a new system that can instill public confidence in our efforts toward responsible development.

More details on the program, including maps and data, can be accessed at the Canada-Alberta Oil Sands Environmental Monitoring Information Portal.

**Industry Best Practices**

**Mining Association of Canada – Towards Sustainable Mining**

As a member of the Mining Association of Canada (MAC), Syncrude benefits from the development and exchange of best practices regarding sustainable growth and development.

Participation in the Towards Sustainable Mining (TSM) initiative is a condition of membership in the association. TSM is a set of guiding principles and performance indicators that govern key activities of companies in the mining and mineral-processing industry. Developed in collaboration with communities of interest and key stakeholders, these principles are mandated across the industry and are embedded throughout Syncrude’s management systems.

Specific measurement criteria in tailings management, energy and greenhouse gas emissions management, Aboriginal and community outreach and crisis management planning is reported annually, externally verified every three years and issued publicly. Safety and health and biodiversity conservation will be reported starting in 2013.

**Canadian Association of Petroleum Producers – Responsible Canadian Energy Program**

As a member of the Canadian Association of Petroleum Producers, Syncrude participates in the Responsible Canadian Energy (RCE) program, which requires members to report their performance and progress in the areas of environment, health, safety and social stewardship.

RCE provides common metrics for performance measurement and reporting, supporting CAPP members in the design and implementation of their internal systems and processes. It also enables sharing of success stories and best practices to elevate overall industry performance.

An annual progress report updates stakeholders on issues and performance. It is reviewed by an external advisory group which provides feedback on the key performance indicators as well as overall structure and content.

**Canadian Council for Aboriginal Business – Progressive Aboriginal Relations Program**

The Progressive Aboriginal Relations (PAR) Program is Canada’s only certification program
with an exclusive focus on Aboriginal relations. It was developed as a framework for companies to measure progress on developing progressive Aboriginal relations and considers corporate efforts in Aboriginal employment, Aboriginal business development, building individual capacity and enhancing relations with Aboriginal communities. Certification includes independent verification and review by a jury composed of Aboriginal business people. Syncrude currently holds Gold Level PAR distinction, the only oil sands operator to do so, and has been accredited at this level five times.

**Canada's Oil Sands Innovation Alliance (COSIA)**

Syncrude is a member of Canada's Oil Sands Innovation Alliance (COSIA). The alliance aims to accelerate the pace of improvement in environmental performance in the oil sands industry through collaborative action and innovation. It focuses on the four environmental priority areas of tailings, water, land and greenhouse gases.

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Air Quality

Performance Overview

- Continued participation in multi-stakeholder Wood Buffalo Environmental Association; community odour monitoring project initiated
- $1.6 billion emissions reduction project nears completion for start-up in 2013
- Upgraded all HVAC units to run on non-ozone depleting refrigerant

Our Commitment

Syncrude is committed to managing and monitoring air emissions to protect the residents and ecological health of the region. Syncrude appreciates that the Wood Buffalo region enjoys good air quality, and we will responsibly manage our operations toward maintaining this in the years ahead.

Regional Air Quality Monitoring

The Wood Buffalo Environmental Association (WBEA) is a multi-stakeholder, not-for-profit, science-based monitoring organization that independently monitors air quality and terrestrial environmental effects in the region. WBEA is headquartered in Fort McMurray and comprises environmental non-government organizations, such as the Pembina Institute, Fort McKay First Nation, Fort McKay Métis Local and Fort McMurray Métis Local, governments, health agencies and industry. The association operates 15 continuous monitoring stations, and 20 passive stations, which measure between three and 10 air quality parameters. Two new stations will come on-line in 2013.

WBEA uses the Air Quality Health Index (AQHI) to help people better understand air quality and its connection to human health. The AQHI is reported on a scale from 1 to 10 to determine the health risk for the general population and for those with respiratory conditions. The lower the number is, the lower the health risks. WBEA’s website reports the AQHI for five areas within the local region—Fort Chipewyan, Fort McKay, Fort McKay South, Fort McMurray and Anzac.

The Fort McKay Berry Focus Group is a partnership between community members of Fort McKay and WBEA’s Terrestrial Environmental Effects Monitoring (TEEM) program. The program engages community members and Elders in an ongoing berry monitoring study, during which they share their observations and pass on their traditional knowledge of regional berry health to scientists. In 2012, a team – comprised of the Berry Focus Group, WBEA staff and an environmental anthropologist - visited berry patches in the local area, as well as Moose Lake, to assess plant health. Some aspects of air quality in the vicinity of berry patches are being monitored with passive techniques in 2013. Field trips to assess berry quality and to pick berries for laboratory evaluation will continue throughout 2013.

WBEA has also increased the number of permanent jack pine forest monitoring plots throughout the region and in Saskatchewan to a total of 25. Twenty-two of these plots have towers that measure monthly concentrations of five air pollutants. Six of the plots have 30-meter tall towers that continuously measure meteorology and other variables affecting forest growth. In addition, 25 separate edge plots have been established to detect an early warning of change in key indicators, well before an impact can be measured.

Due to an increase in regional odour complaints in recent years, WBEA has added three specialized odour instruments at the Fort McKay-Bertha Ganter air monitoring station. These include: a pneumatically-focused gas chromatograph (PFGC) which can simultaneously detect odour-causing volatile organic compounds (VOCs) and sulphur-containing compounds; a methane/non-methane hydrocarbon analyzer to continuously measure concentrations of hydrocarbons associated with industrial and transportation emission sources; and an electronic “nose” to measure the strength and frequency of odours. These instruments are intended to help better understand odours and assist oil sands operators to address this issue. WBEA has also initiated a Community Odour Monitoring Panel project with volunteer participants from Fort McMurray. The panel members have been selected and trained in odour recognition and tracking. They use a specially designed website to report odours in the community of Fort McMurray.

**Air Quality Health Index**
Fort McMurray - Athabasca Valley

- (97.6%) Low Health Risk
- (2%) Moderate Health Risk
- (0.2%) High Health Risk
- (0%) Very High Health Risk

Bertha Ganter - Fort McKay

- (96.1%) Low Health Risk
- (3.4%) Moderate Health Risk
- (0.4%) High Health Risk
- (0.2%) Very High Health Risk
Fort McKay South

- (96.8%) Low Health Risk
- (2.6%) Moderate Health Risk
- (0.4%) High Health Risk
- (0.1%) Very High Health Risk

Ft. Chipewyan

- (98.6%) Low Health Risk
- (1%) Moderate Health Risk
- (0.2%) High Health Risk
- (0.2%) Very High Health Risk
Edmonton

Source: Wood Buffalo Environmental Association (WBEA). Charts depict the percent of 2012 hourly AQHI values within each of the four risk categories – low, moderate, high and very high – calculated for four local WBEA stations, as well as an Edmonton station. Visit www.wbea.org for complete details on pollutants measured by AQHI.

Regional Air Monitoring Stations
The Wood Buffalo Environmental Association operates the most extensive ambient air network in Alberta with 15 air monitoring stations and 20 passive stations.

**Sulphur Dioxide (SO₂) Emissions**

Emissions from Syncrude of sulphur dioxide (SO₂) originate mainly from two fluid cokers built in the 1970s as part of our original operations. Emissions from a third coker is routed through a flue-gas desulphurization unit (FGD). Other sources of SO₂ include flaring and diverter stacks which are used only during coker unit or plant upsets.

When it is necessary to flare or divert gas, we adhere to regulatory requirements and take every possible action to reduce the duration of each incident. We will also decrease the amount of bitumen feed into the coker in order to minimize emissions.

Emissions of SO₂ were higher in 2012 compared to the previous year due to a two-month maintenance shutdown of the coker connected to our flue-gas desulphurization unit. This is still lower than the previous five-year average and compliant with the regulator's 90-day rolling average limit of 250 tonnes per day.

**Sulphur Dioxide Emissions**
Our Emissions Reduction Project will continue our decrease in SO₂ emissions to around 60 percent of 2005 levels.

**Investigating Flue-Gas Desulphurization Unit Performance**

As part of the upgrader expansion in 2006, Syncrude introduced a flue-gas desulphurization (FGD) unit to capture and convert SO₂ emissions into ammonium sulphate which is then used to produce fertilizer at an on-site third party facility.

The unit uses a wet process to remove SO₂. As a result, a high amount of water vapour travels through the stack. SO₂ recovery is excellent, reaching as high as 96 percent. SO₂ and other pollutants, such as ammonia, that were unrecovered in the process are emitted in trace amounts through the vapour.

In response to stakeholder concerns regarding the vapour plume, investigations are underway to assess the options for the best technological or process solution to improve the unit's performance and further increase emissions recovery.
The flue-gas desulphurization unit captures and converts sulphur dioxide (SO$_2$) emissions into ammonium sulphate, which is then used to produce fertilizer.

**Syncrude Emissions Reduction Project Nears Start-Up**

We recognize that local residents expect good air quality. Towards this, we have invested $1.6 billion on emissions abatement technologies which are expected to reduce SO$_2$ emissions to an annual average of less than 100 tonnes per day and particulates by 50 per cent. Facilities will be tied into our two original coker units. We are thoroughly reviewing all aspects of the facility to ensure a smooth start-up and reliable operation.

**Nitrogen Oxide (NOx) Emissions**

Our primary goals with respect to minimizing NOx emissions are to move the maximum volume of material while consuming the least amount of fuel, and to have engines that continue to reduce emissions per litre of fuel consumed. To achieve these, we focus on fuel quality, engine selection, operating and maintenance practices, and mine plan efficiency.

**Other Air Emissions**

Volatile organic compounds (VOCs) can contribute to poor air quality. Sources of VOCs at Syncrude include naphtha losses to our Mildred Lake tailings settling basin and hydrocarbon vapours from storage tanks.
To reduce naphtha losses, wastewater streams are directed through two Naphtha Recovery Units (NRUs), a technology developed by Syncrude in the mid-1980s. We remain within government regulations for naphtha losses and continue to examine how we can improve recovery in the future. Naphtha recovery over the reporting period averaged 85 percent.

A leak detection and repair program has been in place at Syncrude since 1992. As required by our government operating approval, this program was modeled to monitor for leaks according to the Canadian Council of Ministers of the Environment (CCME) Code of Practice. The system enables the identification and repair of vapour leaks, which minimizes VOC releases.

Significant efforts are also being made to reduce ambient air exceedences through reliability and stable operations, and less plant upsets. In 2012, there were 200 exceedences reported by air monitoring stations operated by the Wood Buffalo Environmental Association. Of these, 15 were attributable to Syncrude.

WBEA communication protocols inform Syncrude immediately of any ambient air exceedences. This notification triggers a site-wide investigation into any possible Syncrude sources that may be contributing to elevated readings. If one is identified, mitigative procedures are implemented to minimize air quality impacts. A follow-up report is submitted to Alberta Environment and Sustainable Resource Development within seven days.

We conduct ongoing maintenance to heating and ventilation systems, air conditioners and cooler units to help prevent the release of ozone-depleting substances (ODS) to the atmosphere. In 2012, we experienced 27 exceedences above regulatory limits. These releases were reported to Alberta Environment and Sustainable Resource Development, investigated and repairs made to the source units. As of the end of the year, we had completed the upgrade of replacing all HVAC units with those that operate on non-ozone depleting refrigerant, and expect future releases to decrease accordingly.

**Odours**

Local stakeholders report the presence of any odours to the 24-hour Alberta Environment hotline at 1-800-222-6514. Government authorities then notify local industrial operators of the complaint and require them to assess their operations for possible sources of odours and take remediating action. The regulator informed Syncrude of three odour complaints from the public during 2012 which were attributable to our operation. The odour sources were investigated and promptly resolved.

In the event of an operational upset or scheduled maintenance which could cause odours or affect air quality, we update the public through the Wood Buffalo Air Information Line. The line also provides the Alberta Environment hotline and Health Link Alberta telephone numbers for those residents who have environmental or health related concerns. The information line was developed by the Wood Buffalo Environmental Association and supported by its members. It is accessed by calling 1-866-685-3699.

Due to an increase in regional odour complaints in recent years, the Wood Buffalo Environmental Association (WBEA) has added three specialized odour instruments at the Fort McKay-Bertha Ganter station. These include: a pneumatically-focused gas chromatograph (PFGC) which can simultaneously detect odour-causing volatile organic compounds (VOCs) and sulphur-containing compounds; a methane/non-methane hydrocarbon analyzer to continuously measure concentrations of hydrocarbons associated with industrial and transportation emission sources; and an electronic “nose” to measure the strength and frequency of odours. These instruments are intended to help pinpoint
exact sources of odours and assist oil sands operators to address this issue.

## Air Emissions

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<tr>
<th></th>
<th>Unit</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tr>
<td><strong>Ozone-depleting substances(^1)</strong></td>
<td>kg of CFC11 equivalent/yr</td>
<td>1,629</td>
<td>1,066</td>
<td>1,316</td>
<td>1,653</td>
<td>1,332</td>
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<td><strong>Sulphur dioxide</strong></td>
<td>thousand tonnes/year</td>
<td>70.14</td>
<td>81.31</td>
<td>72.31</td>
<td>64.35</td>
<td>72.28</td>
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<td><strong>Sulphur dioxide emission intensity</strong></td>
<td>kg/m(^3) production</td>
<td>4.12</td>
<td>4.93</td>
<td>4.19</td>
<td>3.82</td>
<td>4.33</td>
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<td><strong>Sulphur dioxide emission intensity</strong></td>
<td>tonnes/KBbls</td>
<td>0.66</td>
<td>0.78</td>
<td>0.67</td>
<td>0.61</td>
<td>0.68</td>
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<td><strong>Nitrogen oxides</strong></td>
<td>thousand tonnes/year</td>
<td>26.11</td>
<td>28.41</td>
<td>30.85</td>
<td>30.65</td>
<td>27.67</td>
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<tr>
<td><strong>Nitrogen oxides emission intensity</strong></td>
<td>kg/m(^3) production</td>
<td>1.53</td>
<td>1.72</td>
<td>1.79</td>
<td>1.82</td>
<td>1.66</td>
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<td><strong>Nitrogen oxides emission intensity</strong></td>
<td>tonnes/KBbls</td>
<td>0.24</td>
<td>0.27</td>
<td>0.28</td>
<td>0.29</td>
<td>0.26</td>
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<td><strong>Volatile organic compounds (VOCs)(^1)</strong></td>
<td>thousand tonnes/year</td>
<td>13.90</td>
<td>13.60</td>
<td>13.80</td>
<td>12.41</td>
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<td><strong>VOC emission intensity(^1)</strong></td>
<td>kg/m(^3) production</td>
<td>0.82</td>
<td>0.83</td>
<td>0.80</td>
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<td><strong>VOC emission intensity(^1)</strong></td>
<td>tonnes/KBbls</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
<td>0.12</td>
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<tr>
<td><strong>NPRI on-site releases(^1)</strong></td>
<td>thousand tonnes/year</td>
<td>NPRI</td>
<td>NPRI</td>
<td>NPRI</td>
<td>NPRI</td>
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<tr>
<td><strong>Sour gas diverting</strong></td>
<td>tonnes per day SO(_2)</td>
<td>0.6</td>
<td>2.0</td>
<td>0.4</td>
<td>0.9</td>
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1. Detailed breakdown at www.ec.gc.ca/pdb/npri

## Key Air Indicators

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<td><strong>Diverter stack usage</strong></td>
<td>hours per year</td>
<td>129.16</td>
<td>265.82</td>
<td>56.28</td>
<td>118.09</td>
<td>90.79</td>
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<td><strong>Sour gas flaring</strong></td>
<td>tonnes per day SO(_2)</td>
<td>7.3</td>
<td>3.2</td>
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<td>3.8</td>
<td>3.9</td>
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<td><strong>Main stack sulphur dioxide</strong></td>
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<td>2</td>
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<td><strong>Main stack sulphur dioxide</strong></td>
<td>90-day rolling average &gt;245 tonnes</td>
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<td></td>
<td># of hours &gt; 1.5 tonnes per hour</td>
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<tr>
<td><strong>Main stack opacity</strong></td>
<td># hours &gt; 40%</td>
<td>84</td>
<td>22</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>&lt; 5</td>
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<td><strong>Ambient air exceedances H₂S hourly</strong></td>
<td>#</td>
<td>55</td>
<td>5</td>
<td>0</td>
<td>14</td>
<td>14</td>
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<td><strong>Ambient air exceedances H₂S 24-hour period</strong></td>
<td>#</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<td><strong>Ambient air exceedances SO₂ hourly</strong></td>
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<tr>
<td><strong>Ambient air exceedances SO₂ 24-hour period</strong></td>
<td>#</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Odour incidents</strong></td>
<td># attributed to SCL</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
The mining industry practices the highest environmental standards with a deep commitment to sustainable development.

“The Mining Association of Canada's Towards Sustainable Mining (TSM) program is a risk management approach to ensuring the responsible development of our industry. It includes annual performance-based public reporting and third-party assurance. Some of the areas covered include tailings management, energy use and GHG emissions, and Aboriginal and community outreach.

We added a biodiversity protocol a couple of years ago because our Community of Interest Advisory Panel recognized it as an emerging issue. We want our industry to respond to it proactively by setting up a system to measure a company's impact on biodiversity, the steps taken to mitigate that impact, and actions taken to promote biodiversity in their operations. Syncrude's work with wood bison and land reclamation are good examples of the directions we want to go with this protocol. The mining industry practices the highest environmental standards with a deep commitment to sustainable development. A commitment to biodiversity conservation is essential.”

Biodiversity

Performance Overview

- Continued to test and install Hyperspike acoustic devices as part of improved waterfowl deterrent system
- Songbird monitoring continued; preliminary results indicate a healthy presence of species in our reclaimed areas
- Wolves outfitted with radio collars as part of industry research on wildlife movement and monitoring
- No charges laid in 2010 regional waterfowl incident, which also affected other oil sands operators

Our Commitment

Syncrude manages biodiversity through a commitment to environmental stewardship which encompasses specific programs aimed at ensuring our operations do not have a long-term permanent impact on local ecosystems and, upon project completion, re-establishing a diversity of wildlife and fish habitats similar to those that existed prior to disturbance of the area.

Through Syncrude’s biodiversity management systems, we strive for continuous improvements in our evaluation and reporting programs, as well as avoidance or mitigation
of significant adverse biodiversity effects, together with improving our communications and reclaiming the land that was disturbed.

Our Adherence to Mining Association Standards

As a member of the Mining Association of Canada, we adhere to the principles outlined in the Towards Sustainable Mining initiative. This includes a protocol on biodiversity conservation which Syncrude assisted to develop. As stated in the protocol, we recognize that "access to land and a company's social license depend upon responsible social, environmental and economic practices and that there is a strong business case for supporting biodiversity conservation. MAC members believe that mining, conducted in consultation with communities of interest, can co-exist with biodiversity conservation."

Biodiversity Planning and Reporting

Syncrude operations must adhere to environmental regulations, including the Alberta Environmental Protection and Enhancement Act, and Alberta Wildlife Act. As well, every 10 years, Syncrude must obtain operating approval by submitting a detailed plan outlining how the organization will steward to government requirements regarding environmental protection, reclamation and mine closure. Compliance reporting and status updates are submitted midway through the reporting period.

Our plan includes an overview on biodiversity establishment and monitoring. It outlines how we incorporate biodiversity into the various aspects of reclamation, including landscape formation, soil placement, vegetation, fish and wildlife.

Many of our practices lead to enhanced opportunities for biodiversity in the reclaimed landscape. For example, we place coarse woody debris in selected areas to provide cover for small mammals and nesting birds. Landforms are also designed with physical/topographical diversity to accommodate both terrestrial and wetland habitats.

Our reclamation specialists contribute to ongoing improvements in biodiversity planning and monitoring in the region through a specialized task group of the CEMA Reclamation Working Group.

Regional Involvement and Biodiversity Initiatives

Several programs and research initiatives have been established in northeastern Alberta to assess and monitor the cumulative environmental effects of industrial development at a regional scale. This work is undertaken by government and stakeholders such as Aboriginal communities, industry, environmental advocacy groups, and health organizations. Syncrude funds and/or provides staff expertise to the following:

Alberta Biodiversity Monitoring Institute (ABMI) – measures and reports on the health of ecosystems in the province. Operating at arm's length from government, industry and environmental groups, it provides peer-reviewed data that is used to improve resource management through the provincial government's Land-use Framework.

The Canadian Oil Sands Network for Research and Development (CONRAD) – supports a broad range of research projects in environmental and reclamation science through its Environmental and Reclamation Research Group (ERRG). Research focuses on a variety of disciplines, from wildlife biology to hydrogeology and toxicology. Grants are typically used to fund university and research organizations aimed at improving existing practices. CONRAD's environmental-related activities are currently being shifted over to Canada's Oil Sands Innovation Alliance (COSIA).
Cumulative Environmental Management Association (CEMA) – established to assess cumulative environmental effects from industrial development and provide recommendations to regulators on how to best manage these issues. It is governed by over 50 members representing all levels of government, industry, regulatory bodies, environmental advocacy groups, Aboriginal communities, academic institutions and the local health authority. Since its inception, the association has delivered 10 major management frameworks on ozone, acid deposition, trace metals, nitrogen, ecosystems and water. The association includes a reclamation working group and traditional environmental knowledge advisory committee through which Aboriginal stakeholders share biodiversity perspectives.

Regional Aquatics Monitoring Program (RAMP) – an environmental monitoring program established in 1997 to assess the health of rivers and lakes in the oil sands region. RAMP collects and analyzes data from aquatic environments to better understand the oil sands area, and to identify and address the potential impacts of development. The organization is continuing with its aquatic monitoring programs as part of the transition to the new Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.

Wood Buffalo Environmental Association (WBEA) – a multi-stakeholder environmental monitoring program that operates similar to, and works jointly with, RAMP. WBEA monitors and reports on air quality in the region and the effects of air quality changes and deposition on terrestrial resources. The association operates 15 ambient and 20 passive air-monitoring stations throughout the region.

These regional initiatives, research projects and biodiversity monitoring programs all use multi-stakeholder and interdisciplinary strategies to monitor the environment and provide recommendations to government for environmental sustainability. The objectives of each of these regional programs include understanding the natural condition of wildlife habitat, reclaiming wildlife habitat, and maintaining biodiversity in the region.

**Wildlife Movement and Corridors**

We do not view our active mining operations suitable for wildlife. We discourage wildlife movement through the area and do not have any crossing structures or corridors on our developed leases. Wildlife presence is also discouraged in active areas to decrease interactions with staff.

As well, in constructing access roads and right-of-ways, we follow existing linear corridors to the greatest extent practical in order to reduce vegetation clearing and habitat fragmentation.

Our operations are not located within the range of Alberta's woodland caribou herds or the proposed protection zones of the draft Recovery Strategy for the Woodland Caribou, Boreal Population. As such, we do not participate in multi-stakeholder groups formed to research and monitor this issue. However, we do keep informed of policy development at the provincial and federal levels regarding any potential impact on our business or land closure requirements.

In 2009, Syncrude, in partnership with the CONRAD Environmental and Reclamation Research Group, commenced a research program into wildlife habitat effectiveness and connectivity in the Athabasca river valley. One hundred remote cameras are placed along five rivers and their adjacent uplands within the Athabasca river watershed, and are used to monitor wildlife between mine boundaries and the river. In 2012, wolves were outfitted with radio collars to help understand their movements and monitoring is on-going.

There will be no habitat barriers on our reclaimed lands at mine closure.
Wildlife Protection

Syncrude operates within a large tract of wilderness in northern Alberta's boreal forest and employs a number of strategies to deter wildlife from our sites. These include our waterfowl protection plan, and restrictions on the handling of food and food waste.

We are required by law to report sightings and wildlife incidents occurring on our site to regulators. In situations where distressed wildlife is found, the animal is assessed and appropriate action is taken under the guidance of Alberta Environment and Sustainable Resource Development Fish and Wildlife officials.

Regular reminders are communicated to employees and contractors outlining the danger of feeding wildlife and improper disposal of refuse. Other measures used to deter wildlife include regular garbage pick-up and scare cannons. In addition, in 2010, we reached an agreement with the Regional Municipality of Wood Buffalo to start transporting non-hazardous waste to the municipal landfill. This has reduced the number of seagulls and predators, such as bears, wolves and coyotes, attracted to this area.

There were seven non-avian wildlife mortality incidents, including those related to natural causes, in 2012. All were reported to Alberta Environment and Sustainable Resource Development.

Waterfowl and Bird Protection

Measures are in place to protect local birds and deter migrating waterfowl from our site. For example, no vegetation is cleared during the migratory songbird nesting and rearing season unless survey and field checking indicate an absence of nesting activity.

We also follow a number of procedures to deter waterfowl and other birds from coming in contact with bitumen on our process ponds and tailings areas. Propane-fired cannons and falcon effigies with sound effects are placed in the water or on the shoreline of ponds. Monitoring occurs on a full-time basis throughout the migration period and, if necessary,
pyrotechnic flare guns, airhorns and boat movement are also used. Radar monitoring systems, similar to those used at airports, are also in place which automatically activate our deterrent system when birds are detected in the area.

In 2012, we continued to test and install Hyperspike acoustic devices capable of projecting precise, directional sound towards areas of bird activity detected by radar.

Significant progress is also being made in the development and implementation of technologies to accelerate tailings ponds reclamation. See the Tailings Management chapter for more detail.

Avian Incident Tracking

Includes all bird and waterfowl mortalities related to oiling. Incidents are reported to the Alberta Government Sustainable Resource Development department.

Update on 2010 Waterfowl Incident

In October 2010, despite a fully operational bird deterrent system, about 460 ducks landed on the Mildred Lake settling basin and were euthanized due to coming into contact with bitumen floating on the surface. Other operators reported similar occurrences. After a thorough investigation involving input from a leading academic and expert in human-wildlife encounters, the Government of Alberta announced in 2012 that charges would not be laid in the incident.

The investigation concluded the bird landings could not have been prevented due mainly to adverse weather conditions. This included strong and variable winds, freezing rain and poor visibility. These factors forced migratory birds to land in large numbers in and around tailings ponds, as well as onto roadways and parking lots.
Based on the investigation report, further enhancements have been made to Syncrude’s deterrent system to take into account deterrent positioning and how artificial light can influence bird behaviour in poor weather.

Wildlife Monitoring

There are a number of initiatives underway to monitor wildlife throughout the oil sands region, including Syncrude reclamation areas. For example, we continue to support the Alberta Biodiversity Monitoring Institute and the projects developed through the Ecological Monitoring Committee for the Lower Athabasca Planning Region. As well, through CEMA’s Wildlife Task Group, we participate in the Early Successional Wildlife Monitoring Program on Reclaimed Plots in the Oil Sands program.

In addition, during consultations on a permit change to our sand storage facility, we were asked by our Aboriginal stakeholders to investigate the presence of large terrestrial mammals on the site and compare it with surrounding areas. In response, we initiated a project with Keyano College to study the area over a three-year period, ending in 2012. Results are now being evaluated.

Further research began in 2011 with the Institute for Bird Populations’ Monitoring Avian Productivity and Survivorship (MAPS) program. This program monitors numbers, habitat development, bird reproduction and survivorship in reclaimed areas and compares it with natural habitats. Preliminary results indicate a healthy presence of songbirds in our reclaimed areas. Studies continued in 2012.

We also monitor the wildlife that has returned to our reclaimed land to ensure restoration practices are creating attractive habitat for species to return. Regulators require this data as part of the government certification process.

Songbirds like warblers frequent Syncrude’s reclaimed oil sand mine sites. Syncrude has engaged the Institute for Bird Populations’ Monitoring Avian Productivity and Survivorship (MAPS) program to help examine their migration patterns through the region.

Parks and Protected Areas

Syncrude’s operations are not located on, or adjacent to, any protected area, park or nature reserve. There are however a number of protected parks and areas throughout the boreal forest of northeastern Alberta, including Wood Buffalo National Park – the largest national
park in the country and a UNESCO World Heritage site – located approximately 200 kilometres north.
Climate Change

Performance Overview

- Energy intensity averaged 1.28 million BTUs per barrel
- Greenhouse gas emissions intensity averaged 0.101 tonnes CO\textsubscript{2}e per barrel
- Paid $14 million to Alberta Government Climate Change and Emissions Management Fund

Our Position

The global need for energy is growing and all sources, including conventional oil, oil from oil sands and renewable energy forms, will be needed. As a contributor to this energy mix, Syncrude recognizes public concerns related to the greenhouse gas emissions (GHGs) stemming from oil sands development and believes every sector of our economy needs to do its part to help Canada realize its objectives in reducing our carbon footprint.

Our focus on energy efficiency and conservation will minimize the growth of GHGs that stem from production of synthetic crude oil at our operations. We will achieve this through operational reliability, as well as continued investment in research to develop incremental and breakthrough technologies that reduce our GHG emissions per barrel.

Energy Efficiency Stewardship

Syncrude has a long history of energy conservation. For example, our operations incorporate extensive cogeneration processes in order to recover waste heat for reuse. We also developed oil sands hydrotransport and low energy extraction in the 1990s. These processes enabled us to move away from the energy-intensive draglines and bucketwheel reclaimer system, and reduce extraction water temperatures by around 50 percent.

These types of step-change advancements not only improve our energy efficiency, while correlating directly to lower greenhouse gas emissions, they also provide significant benefit to the bottom line. As we continue to pursue the next generation of oil sands technologies and reliability improvements, energy efficiency remains a key factor when evaluating capital and maintenance projects.
As part of our adoption of ExxonMobil processes, Syncrude is currently implementing new operations management systems – the Operations Integrity Management System (OIMS) and the Global Reliability System (GRS) – to improve reliability and environmental performance. Regarding specific energy efficiency projects, our current focus is on improved monitoring of Key Energy Variables (KEVs), which typically are instrument tags or process parameters that panel operators and contact engineers can use to identify energy conservation opportunities. Additional initiatives include optimizing furnace operations, reducing flaring and repairing steam leaks. Our 2013 energy use target is 1.29 million BTUs per barrel.

Energy management is a component of variable incentive compensation for executive and senior leaders. It is also incorporated into our Impact 21 program in which employees are financially rewarded for achieving goals in operational performance areas. For further information, see discussion on Management Systems.

Syncrude generates its own electricity and is a net exporter to the Alberta grid. In fact, we exported around 42,000 MWh in 2012.

**Energy Conservation - Energy Intensity**

![Energy Use](image)

**Greenhouse Gas Emissions**

<table>
<thead>
<tr>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHGs - millions of tonnes (as per Environment Canada quantification guidelines)</td>
<td>11.775</td>
<td>11.666</td>
<td>12.721</td>
<td>12.873</td>
<td>12.366</td>
</tr>
<tr>
<td>GHGs - millions of tonnes (as per Specified Gas Emitters Regulation)</td>
<td>10.404</td>
<td>10.007</td>
<td>11.091</td>
<td>11.236</td>
<td>10.667</td>
</tr>
<tr>
<td>GHGs - tonnes CO₂e per barrel produced</td>
<td>0.095</td>
<td>0.097</td>
<td>0.102</td>
<td>0.106</td>
<td>0.101</td>
</tr>
</tbody>
</table>

1. As reported to Environment Canada. Emission calculations for the purpose of provincial and federal regulatory reporting will differ, as certain sources of...
emissions are excluded.

2. CO₂ equivalent emissions reported include all Syncrude sources (net of industrial process, biomass, and waste and wastewater emissions) as reported to the Government of Alberta under the Specified Gas Emitters Regulation (SGER).

3. Syncrude’s GHG emission estimates were verified by Conestoga-Rovers & Associates to satisfy the ‘Third party Review’ required by the SGER.

4. Syncrude is a large producer of electricity and is a net exporter to the Alberta grid. Syncrude exported 42,028 Megawatt hours of electricity in 2012. Emissions from electrical power generation are included in the Syncrude total and are part of the intensity calculated on a per-barrel produced basis.

### Energy Conservation

<table>
<thead>
<tr>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total energy consumption</strong> (billion BTUs)</td>
<td>131,028</td>
<td>131,858</td>
<td>136,623</td>
<td>136,647</td>
<td>133,926</td>
</tr>
<tr>
<td><strong>Energy intensity</strong> (million BTUs per barrel)</td>
<td>1.22</td>
<td>1.27</td>
<td>1.26</td>
<td>1.27</td>
<td>1.28</td>
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<tr>
<td><strong>Energy intensity improvement</strong> (% as compared to year prior)</td>
<td>6.3</td>
<td>-3.5</td>
<td>0.3</td>
<td>-0.9</td>
<td>-0.4</td>
</tr>
<tr>
<td><strong>Energy intensity improvement</strong> (% as compared to 1990)</td>
<td>9.0</td>
<td>7.0</td>
<td>7.2</td>
<td>6.6</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>Energy return ratio</strong> (million BTUs of SCO product per million BTUs of energy consumed)</td>
<td>4.6</td>
<td>4.4</td>
<td>4.4</td>
<td>4.4</td>
<td>4.4</td>
</tr>
</tbody>
</table>

### Alberta Carbon Tax and Off-Set System

The Alberta Specified Gas Emitters Regulation, established in 2007, set aggressive intensity targets for Large Final Emitters of carbon dioxide. It requires Syncrude to reduce per barrel emissions of greenhouse gases by 12 percent from the average of per barrel emissions between 2003 and 2005. If Syncrude does not meet this target in any reporting year, we must purchase offset credits or pay into a government fund dedicated to the development of emissions reduction technology. Both these options are assessed at $15 per tonne of CO₂ that is in excess of reduction targets.

Syncrude did not meet the reduction target for 2012. We offset the remainder by purchasing $14 million Government of Alberta Technology Fund Units. Our emissions data was independently verified by Conestoga-Rovers & Associates and met requirements under the regulation as well as ISO 14064-1 and ISO 14064-3.

### Monitoring Development of Federal Regulations

To date, the Canadian government has pursued a sector-by-sector approach to climate change regulation, beginning with the electricity and transportation sectors. To date, no broad climate change legislation has been introduced that focuses on the oil sands sector.

Syncrude believes every sector of our economy will need to do its part to help reduce our nation’s carbon footprint, and the oil sands industry should neither receive preferential or detrimental treatment in any legislation. The evolution of climate change policy in Canada and North America is actively monitored by our Joint Venture participants, and developments are reported through the Syncrude Management Committee.

### Creating and Sharing Best Practices

Toward sustained progress in energy conservation and reduced GHG emissions, Syncrude
draws on the experience and expertise of others through its participation in the following external groups:

- **Canadian Industry Program for Energy Conservation (CIPEC).** This collaboration between government and business is aimed at improving the energy efficiency of industries across the country. Syncrude is one of two oil sands industry members.

- **Mining Association of Canada, Towards Sustainable Mining (TSM).** Syncrude reports its progress on energy and greenhouse gas emissions management annually. Results are externally verified once every three years.

- **Integrated CO₂ Network (ICO2N).** Representing a cross-section of western Canada's industrial CO₂ emitters, this industry association provides input to government policy about carbon capture and storage (CCS) and advocates for CCS as a part of Canada's climate change plans. The group is also helping shape a regulatory framework for CCS.

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Land Reclamation

Performance Overview

- Permanently reclaimed 300 hectares; cumulative reclamation reaches 3,300 hectares
- Planted approximately 954,000 shrub and tree seedlings, and 5,000 cuttings; cumulative planting now over seven million
- Announced $2.6 million reclamation research chair at the University of Saskatchewan

Our Policy

Syncrude will ensure the land disturbed by our operation is returned to a stable, safe condition that is capable of supporting biologically self-sustaining communities of plants and animals. Our long-term vision is to create a landscape that sustains an integrated mosaic of land uses that meet stakeholder expectations.

Our policy adheres to the Alberta Environmental Protection and Enhancement Act which requires Syncrude to return the land we use to a productive capability equivalent to that of the pre-disturbance landscape.

Reclamation Plan Provides Outlook to 2070-90

Syncrude is required by Alberta legislation to submit a reclamation and closure plan every 10 years, with a mid-term update provided five years after the submission. We provided our update to regulators in 2011. This plan is separate from, but consistent, with our ERCB Directive 074 submission which outlines our tailings management plan.

The reclamation plan outlines in detail the various elements involved in closure of our operation up to end-of-mine life for our Mildred Lake site and Aurora North site, between 2070 and 2090. It includes information on our regulatory framework, regional planning, consultation, landform design, water management, soil conservation and management, materials balance, forest resources and timber salvage, upland vegetation, wetland reclamation, biodiversity establishment and monitoring, and reclamation monitoring and research.
The closure plan also provides an overview and update on modelling and activities to improve and develop reclamation science, addressing key issues such as landform evolution, water management, salts and their effects on soils, vegetation and surface water, and ecosystem design for establishing natural plant and animal communities.

Reclamation Progression*

Creating a Self-Sustaining Landscape

Our reclamation goals are to ensure the final reclaimed landscape:

- has capability equivalent to that existing prior to development,
- is integrated with the surrounding area,
- establishes boreal forest upland and lowland communities,
- yields water suitable for return to the natural environment, and
- is planned in direct consultation with local, directly affected stakeholders, such as neighbouring Aboriginal communities and the Regional Municipality of Wood Buffalo.

Performance objectives include that the land will be suitable for commercial timber production, extensive areas are returned to a natural state and suitable for traditional land uses (hunting, trapping, fishing and harvesting of traditional plants), and wildlife habitat is deemed to be within the natural variability in the region.

To ensure a regional approach to reclamation, and to foster the use of reclamation best practices, Syncrude regularly consults with other operators and openly shares the results of our environmental research.

Ongoing Reclamation Activities

Reclamation of our former East Mine area is ongoing. This area is approximately 11.5
square kilometers in size and is bordered by Highway 63 south of our main plant site and upgrader. It was part of our original operation when Syncrude began production in 1978. Reclamation began in 2000 using composite tails technology.

In our former West Mine area, also part of our original operation, reclamation began in late 2012 using the method of capping fluid fine tails with water.

Further discussion on reclamation of these areas can be found in the Tailings chapter.

**Research on Soil Containing Hydrocarbons**

Pre-disturbed soil conditions in the area of our Aurora North Mine have resulted in unique vegetation communities which Aboriginal stakeholders expect us to return after mining. The soil also contains extensive naturally occurring petroleum hydrocarbons, such as "tarballs", which may present unique reclamation challenges. A 40-hectare watershed research project is evaluating these challenges and the most effective salvage and soil cover design strategies for reclamation. The study is a multi-disciplinary, collaborative project involving research scientists from Syncrude, the University of Alberta, University of Saskatchewan, consultants and industry partners through the Canadian Oil Sands Network for Research and Development (CONRAD).

**Watershed Research**

Research continues on a number of watersheds established on our reclaimed land. Announced in 2012, Syncrude will also provide half the funding for the $2.6-million Chair in Hydrogeological Characterization of Oil Sands Mine Closure Landforms, at the University of Saskatchewan. The other half of the funding is being provided by the Natural Sciences and Engineering Research Council (NSERC). The five-year project will improve reclamation by understanding how groundwater moves through landforms. In addition, Syncrude contributes financial grants to other Canadian and U.S. universities. Research supports the long-term data collection, instrument maintenance and database management of soil, climate and hydrology monitoring of these areas.

**Bioengineering Helps Control Erosion**

Fascines are being evaluated as a natural erosion control technique in reclamation areas. Wood harvesters are used to collect willow and poplar trees, which have the ability to produce roots and stems from cuttings. These trees are delimbed and bundled together to produce a fascine. Tree tops from merchantable harvest operations are also bundled together and used as fascines. These structures have the ability to slow down the flow of water on reclaimed landscapes and help minimize erosion.

Around 5,000 stems of balsam poplar and willow were harvested to create 164 fascine bundles that will continue to grow. Previously constructed fascines are now fully established and wildlife have been observed.

**Rough Mulching Aids Reclamation Efforts**

A salvaging technique developed by Syncrude is helping to avoid soil compaction on reclamation areas and create diverse microsites for plants and animals.

Before soil salvage, the tops and stumps of non-merchantable trees are recovered using a method called "rough mulching." This adds large pieces of woody debris into the cover soil. When soil is being placed, this coarse material creates surface roughness. This, in turn, creates microsites and moisture traps for vegetation and erosion control. There is also faster
self-establishment of native plant species from the seed bank and various propagules present in the soil.

Example of rough mulching at fen reclamation project.

## Land Use

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleared (cumulative hectares)</td>
<td>--</td>
<td>2,742</td>
<td>3,072</td>
<td>2,597</td>
<td>3,719</td>
</tr>
<tr>
<td>Disturbed: land used for mine or plant purposes (cumulative hectares)</td>
<td>--</td>
<td>16,670</td>
<td>16,954</td>
<td>18,287</td>
<td>19,155</td>
</tr>
<tr>
<td>Total land disturbed – mine and plant site footprint (cumulative hectares)</td>
<td>21,912</td>
<td>24,289</td>
<td>25,265</td>
<td>25,858</td>
<td>27,861</td>
</tr>
<tr>
<td>Soils placed – land available for revegetation (cumulative hectares)</td>
<td>-</td>
<td>1,025</td>
<td>1,216</td>
<td>1,202</td>
<td>1,086</td>
</tr>
<tr>
<td>Temporary reclamation (cumulative hectares)</td>
<td>-</td>
<td>452</td>
<td>422</td>
<td>690</td>
<td>690</td>
</tr>
<tr>
<td>Permanent land reclaimed (hectares per year)</td>
<td>32</td>
<td>64</td>
<td>130</td>
<td>200</td>
<td>330</td>
</tr>
<tr>
<td>Permanent land reclaimed (cumulative hectares)</td>
<td>3,441</td>
<td>3,505</td>
<td>3,572</td>
<td>3,186</td>
<td>3,316</td>
</tr>
<tr>
<td>Trees and shrubs planted (# per year)</td>
<td>162,000</td>
<td>143,000</td>
<td>250,000</td>
<td>356,000</td>
<td>954,000</td>
</tr>
<tr>
<td>Trees and shrubs planted (millions, cumulative)</td>
<td>5.2</td>
<td>5.3</td>
<td>5.5</td>
<td>5.9</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Note: In 2009, the Government of Alberta introduced new definitions for oil sands reclamation. These are reflected in our reporting data. Click here for a complete list of definitions.

1. In 2010, the Government of Alberta established a new definition for “permanent reclamation.” For an area to be considered reclaimed, the definition states it must be revegetated in accordance with government-approved plans. Syncrude’s prior definition of a reclaimed area was land that, at a minimum, had been shaped, formed, capped with soil and ready for revegetation. This change resulted in the reclassification of land previously reported by Syncrude in our reclamation numbers. We have amended our reclamation numbers to
ensure consistency with government reports.

2. Includes land certified by the Alberta Government.

3. Numbers include the addition of all newly reclaimed areas as well as any reclamation losses due to redisturbance that may occur. Every effort is made to minimize disturbance of permanently reclaimed areas; however, by progressively reclaiming we may reclaim areas that are later required for operations or other reclamation activities, such as soil stockpiling.

Sharing of Reclamation Material with Other Operators

Where feasible, Syncrude and the neighbouring Suncor operation are coordinating the use of reclamation material as part of regional land-use planning. In 2012, for example, we optimized the reclamation material available in the Fort Hills area, located at the northern boundary of our Aurora North site. After salvaging material in the area for our own reclamation activities, the remaining surface soil and subsoil was stockpiled on Suncor’s lease for their use.

Tree and Shrub Seedlings Planted

Oil Sand Pie Charts
**Oil Sands Reclamation (permanent and certified)**

Permanent and certified

- (68%) Syncrude
- (32%) Other Oil Sands Mining

**Oil Sands Mining Active Footprint (hectares)**

Hectares

- (27%) Syncrude
- (73%) Other Oil Sands Mining


**Permanent Land - Reclaimed**
Note: In 2010, the Government of Alberta established a new definition for “permanent reclamation.” For an area to be considered reclaimed, the definition states it must be revegetated in accordance with government-approved plans. Syncrude’s prior definition of a reclaimed area was land that, at a minimum, had been shaped, formed, capped with soil and ready for revegetation. This change resulted in the reclassification of land previously reported by Syncrude in our reclamation numbers.
Tailings Management

Performance Overview

- Contributed to technology roadmap outlining tailings management methods and research
- Investing almost $2 billion on commercial-scale centrifuge plant; testing of technology exceeds expectations
- Construction continued on $800 million composite tails plant at Aurora Mine
- Regulator notes Syncrude "exceeded expectations" for tailings fines capture over the combined 2010/11 and 2011/12 reporting periods

Our Position

We recognize stakeholders' interest regarding the pace of reclamation and are vigorously pursuing strategies to accelerate our reduction of fluid fine tailings volumes and their conversion into material that can be used in aquatic, wetland and upland reclamation. In addition, we will continue to share knowledge and actively work with industry partners and the scientific community towards further solutions.

What Are Tailings?

At Syncrude, tailings are a byproduct of our process to extract bitumen from oil sand. Tailings are composed of a mixture of water, sand, clay, fine solids, residual hydrocarbon and salts – all of which are naturally found in oil sands deposits.

Tailings are placed in large landforms commonly referred to as settling basins or tailings ponds. Tailings ponds serve two uses – one, as the recycled water source for our plants and, two, as a containment area which enables tailings to segregate prior to further dewatering for use in reclamation activities.

The primary tailings management challenge is the long period of time it takes for some solid components to settle. While the sand settles rapidly, clay and fine solids (together called fluid fine tailings or FFT) can take decades to settle on their own.
In the settling process, water rises to the top of the tailings pond and is then reused in the bitumen extraction process. Over 85 percent of the water we use is recycled from our settling basins. The Mildred Lake Settling Basin and Aurora Settling Basin are the main sources of recycled water for our operation.

Tailings also contain bitumen that is not recovered in the extraction process. As the bitumen is released, it floats to the top of the settling basin and can appear as an oily slick on the water surface. Bird deterrents are in place year-round to discourage waterfowl from landing (see discussion in Biodiversity chapter).

Bitumen is a valuable natural resource and, while recovery is about 90 percent, we are studying new technologies and processes to increase this even further. This will reduce the amount of bitumen lost to tailings.

**Transforming Tailings Into Reclaimed Landscapes**

We believe our multi-pronged approach to tailings management will enable us to meet the long-term intent of the Energy Resources and Conservation Board (ERCB) Directive 074. This Directive, established in 2009, specifies performance criteria for the reduction of fluid tailings and the formation of trafficable deposits. Our submission was one of the first to be approved by the ERCB.

As we work towards achieving our plan, three technologies are now being deployed: water capping, composite tails and centrifuging. At the same time, we continue to research additional methods while also participating in Canada's Oil Sands Innovation Alliance (COSIA), which exchanges findings amongst industry operators.

**Water Capping**

Water capping involves the placement of a layer of water over a deposit of fluid fine tails to form a lake. Syncrude began researching this technology in the 1980s and has demonstrated its viability through laboratory testing and 11 test ponds of various sizes. Results have shown these lakes will evolve into natural ecosystems and, over time, support healthy communities of aquatic plants, animals and fish.

We commissioned the industry's first commercial-scale demonstration of water-capped end pit lake technology in late 2012. It will be used to evaluate the large-scale viability of water capped tailings as a remediation strategy for both fluid fine tailings and oil sands process-affected water. It will be monitored intensively for about 20 years following commissioning to demonstrate that the lake is developing into a viable ecosystem and to prove that this technology can be used on other oil sands leases. Long-term monitoring will continue after this demonstration period is complete.
Eleven test ponds were utilized over the last two decades to research the water capping method.

Composite Tails

Composite Tails (CT) combines fluid fine tails with gypsum and sand as tailings are deposited in a mined-out area. This mixture causes the tailings to more quickly settle and release water. CT is then capped with sand and soil, enabling the development of landscapes that support grass, trees and wetlands. This technology is now being used at the Mildred Lake site and will be implemented at the Aurora North Mine starting in 2013 with the construction of a $800 million processing plant.

CT was used in reclamation of our former East Mine. Placement began in 2000 and was complete in 2011. Sand capping to established closure drainage is ongoing. A 54-hectare fen wetland research project has been constructed at the northwest end of this area. Soil and woody debris have been placed and locally-collected seeds spread throughout the area. Close to 100,000 seedlings were planted on the site in 2012. Species include: trembling
aspen, white birch, jack pine, white spruce, black spruce, dogwood, green alder and chokecherry. Wetland vegetation will be planted in 2013, at which time active research will begin on hydrology, wetland and terrestrial plant response, and climate conditions. A 65-hectare area directly east of the fen project is expected to be permanently reclaimed in 2015.

Fens are an important type of peat land found in the boreal forest. This large-scale reconstruction effort is the first of its kind in the world and underscores our commitment to return the land we disturb to a condition similar to that prior to disturbance.

We are also working to improve CT deposition and increase fines captured through a technique which places CT under a layer of water or fluid fine tails in the mined-out area. Tailings sand and the fluid fine tails are mixed with gypsum to create CT and, once deposited, water is then released and recycled. Commercial-scale testing is underway.

**Centrifuged Tails**

We have successfully piloted the use of centrifuges to remove the water in fluid fine tails. This technology produces a soft, clay-rich material that can be used as the landform foundation in oil sands reclamation areas. We are implementing this technology in two stages – a commercial-scale demonstration plant which began operations in 2012 and a $1.9 billion full-scale commercial plant to come on-line in 2015. The demonstration plant is performing better than our initial projections – we are currently processing three million cubic metres of fine tailings with plans to expand capabilities to six million in 2014.

**The Quest for New Solutions**

We are currently researching a number of additional technologies, which could be used to supplement existing remediation methods and reduce bitumen in tailings ponds. These include:

**Accelerated Dewatering**

Also referred to as rim ditching, accelerated dewatering is based on methods used in the Florida phosphate industry. It involves depositing fine tailings in a shallow containment structure and removing the water from the surface as it is released. Initial tests have shown a reduction in FFT volume by 50 percent in three to five years. Further study continues on a larger scale.

**Overburden Mixing**

This method proposes mixing fluid fine tails with overburden, and placing the resulting material into mined-out pit areas for incorporation into reclamation landscapes. A demonstration pilot plant is scheduled to come on-line in 2015.

**Deep Deposit**

This method involves placing the clay material from the centrifuge process directly into a former mine pit, rather than in thin lifts, to further dewater. This will reduce the amount of clearing and disturbance otherwise required, while also decreasing transportation distances and related energy use. It could also potentially speed up the time it takes to prepare former mine sites for reclamation activities. A four-year commercial-scale investigation of this method is expected to begin in 2015 in a former mine pit about 50 metres deep.

**Bitumen Removal From Tailings Streams**

Our extraction process recovers around 90 percent of the bitumen in the oil sand. The remaining bitumen is lost to the tailings stream and enters the settling basin. Recovery of
this bitumen represents a significant economic opportunity and addresses key stakeholder and environmental concerns regarding potential risks to waterfowl. Bitumen recovered from either the tailings stream directly or from existing tailings areas would then be processed into crude oil product.

**Collaboration Key to Advancements**

We work collaboratively with other operators through the Tailings Environmental Priority Area of Canada's Oil Sands Innovation Alliance (COSIA). Through this group, we are sharing the results from our past efforts and cooperating on research and development activities going forward. This initiative foregoes intellectual property rights on technologies and makes $400 million of past industry research available to all parties.

**Directive 074 Commitment**

As of 2015, Syncrude expects to meet the conditions outlined in the Energy Resources and Conservation Board (ERCB) Directive 074 which requires a minimum 50 percent tailings fines capture. The ERCB approved our plan in 2010, allowing us to construct facilities and implement the proven technologies necessary to ensure full compliance by 2015.

Over the 2010/11 period, we achieved a fines capture of 17.7 percent, almost double our commitment to the regulator. Over the 2011/12 reporting period, due to reliability issues with the composite tails plant, fines capture was lower than the regulated requirements at 8.8 percent. However, over both periods, Syncrude's combined fines capture was around 25 percent more than committed to the regulator.

In total, we are investing significant capital – around $2.8 billion over several years – on meeting the long-term intent of the Directive.
Water Management

Performance Overview

- 86 percent of water used in 2012 was from recycled sources
- No reportable spills to local water bodies
- Water treatment research continues; coke byproduct filters tailings water and removes napthenic acids
- University research chair established to explore additional methods of treating tailings water

Our Commitment

Water is essential to Syncrude's operation and plays a key role in our production processes. We recognize that water is a limited resource that must be managed carefully. Our commitment is to take prudent steps to manage and conserve the water we use and to protect the health of regional water bodies, including groundwater.

Syncrude's water management practices are based on the objectives of minimizing the withdrawal of fresh water from the Athabasca River, maximizing reuse of process-affected water, and responsibly managing its storage.

Using Water Wisely

The Athabasca River is our main source of fresh water. It provides about 15 percent of our total water needs. Water imported from this river is used to cool process water, generate steam and as potable water. The remaining water used – approximately 85 percent – is recycled from our settling basins, also known as tailings ponds, and used in bitumen extraction processes. In 2012, 86 percent of the water used was recycled from these sources.

Water use increased in 2012 due partially to requirements for the fen reclamation research area and the Base Mine Lake project. We estimate our raw water intake will increase by between five to 10 million cubic metres over the next five years to support this project. This water will be sourced from Beaver Creek Reservoir.
Our water license, granted to Syncrude in the 1970s, permits us to withdraw 61.7 million cubic metres of fresh water annually. In 34 years of operation, we have always operated well within these limits and will continue to do so. Currently, we withdraw about 0.2 percent of the river's average annual flow or the equivalent of around 18 hours of total yearly flow.

We are committed to water conservation and have historically demonstrated continuous improvement. In fact, we have reduced the water intensity of our processes by about 60 percent from levels in the early 1980s. Today, we require about two cubic metres of fresh water to produce a cubic metre of crude oil.

Syncrude has been in operation for over three decades. Throughout those years, many considerable gains were made in water conservation. Now, work is underway to define a water strategy going forward. This will examine how we can continue to make improvements in our processes over the short-term while engaging our research department towards developing new technologies that will further minimize our import of fresh water in the future.

For example, we plan to recover water from reverse osmosis units for use in our emissions reduction project. We estimate this will offset about two million cubic metres of water that would have been otherwise withdrawn from the Athabasca River.

### Releases to the Environment

Alberta Environment prohibits the release of any water that does not meet quality regulations. Syncrude does not discharge process-affected water, waste water or any industrial run-off into local water bodies. The only discharges to the Athabasca River are treated sanitary sewage similar to that discharged by municipalities, diverted clean surface water and basal water from the Aurora Mine via Stanley Creek, and clean surface water from a gravel pit. All precipitation runoff and seepage from our tailings settling basins are collected in ditches or small ponds and pumped back into the settling basin.
During the reporting period, there were no spills to local water bodies.

**Advances in Tailings Water Treatment**

We recognize that, by not releasing water, we are creating an increasing storage challenge that is not acceptable to our stakeholders. As well, from a reclamation perspective, it is necessary to build a final landscape with a hydrology that connects seamlessly to the surrounding environment. Towards this, we have conducted research on tailings water treatment using coke, a byproduct of our process. The treatment is similar to using a home water filter. The coke, which is almost pure carbon, acts as a filter that captures contaminants and, most importantly, naphthenic acids. Bench-scale research shows the treated water is able to support aquatic life. We are running a pilot-scale plant which will answer further technical questions and provide the design requirements for possible commercial-scale implementation.

![A research project has shown that tailings water can be treated with coke, a byproduct of our process which is almost pure carbon. The treatment is similar to using a home water filter. Pictured here, tailings water before (left) and after (right) coke filtration.](image)

**Our Support for a World-Class Regional Water Monitoring System**

In 2010, the Royal Society of Canada commissioned an Expert Panel of Canadian Scientists to review and assess evidence relating to several perceived environmental impacts of the oil sands, including regional water supply. According to their assessment, current evidence does not suggest a threat to the viability of the regional aquatic ecosystem. However, stakeholders remain concerned about downstream impacts.

To address ongoing concerns, a government-sponsored contaminant load study is currently underway that is examining how air particulates, land disturbance and drainage may affect water quality. Also, in early 2012, the Alberta and Canadian governments announced a joint implementation plan for integrated environmental monitoring in the oil sands region. The plan builds on monitoring already in place and outlines a phased, adaptive implementation approach to monitoring over the next three years. Syncrude supports a
credible, transparent and science-based approach that can guide us effectively on responsible water management in the future.

### Water Use

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imported from Athabasca River</strong></td>
<td>million m$^3$</td>
<td>41.2</td>
<td>37.5</td>
<td>34.1</td>
<td>38.5</td>
<td>39.6</td>
</tr>
<tr>
<td><strong>Imported from Athabasca River</strong></td>
<td>m$^3$/m$^3$ production</td>
<td>2.45</td>
<td>2.31</td>
<td>1.97</td>
<td>2.28</td>
<td>2.35</td>
</tr>
<tr>
<td><strong>Water returned to the Athabasca River - treated sanitary</strong></td>
<td>thousand m$^3$</td>
<td>233</td>
<td>270</td>
<td>320</td>
<td>321</td>
<td>312</td>
</tr>
<tr>
<td><strong>Water returned to the Athabasca River - other (Aurora diversion)</strong></td>
<td>thousands m$^3$</td>
<td>2.5</td>
<td>4.9</td>
<td>10.5</td>
<td>7.9</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Process water recycled</strong></td>
<td>millions m$^3$</td>
<td>268</td>
<td>258</td>
<td>278</td>
<td>270</td>
<td>242</td>
</tr>
<tr>
<td><strong>Process water recycled</strong></td>
<td>% of total water used</td>
<td>87</td>
<td>87</td>
<td>89</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td><strong>Water discharge quality exceedances (treated sanitary)</strong></td>
<td># of incidents</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Water discharge quality exceedances (industrial process)</strong></td>
<td># of incidents</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Reportable spills to natural water bodies</strong></td>
<td>m$^3$</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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Waste Management

Waste Management Guidelines

Syncrude is committed to the proper handling and disposal of waste materials from our operations. The objectives of our waste management program are to continually reduce the quantity of waste generated, and to examine each waste stream with the view to reduce, reuse or recycle materials where possible. Syncrude also aims to ensure compliance with all applicable legislation regarding the disposal and recycling of waste materials. We recognize that many waste materials contain substances that could contaminate the environment and pose risk to human health if they are not properly managed.

We **Reduce** waste through the use of an inventory management system that records and accounts for raw materials and process chemicals on-site. Waste reduction is also achieved through process changes, operational changes and equipment modifications. Through these means we endeavour to use less hazardous substitutes for toxic materials, change procedures that generate waste, and look for new methods or technologies to better capture hazardous waste.

We **Reuse** waste by finding new uses for it (for example, oily rags collected from Syncrude laboratories and shops are cleaned and reused). As well, our asset recovery program redistributes materials such as protective clothing and janitorial equipment.

We **Recycle** waste by gathering used materials so they can be reclaimed and reprocessed by recyclers. Examples include paper, vehicle batteries, scrap metals, catalysts and beverage containers. Used lubricating oil is recycled on site.

**By Practicing the 3Rs, Syncrude:**

- Saves on raw material and production costs
- Reduces waste disposal cost
- Assumes less risk of liability for future cleanup
- Reduces movement of waste on public roads
- Encourages resource conservation and recovery
- Demonstrates environmental leadership
Recycling Programs

- **Hazardous Waste Roundup** – Syncrude annually holds a round up to collect hazardous wastes on our site. The wastes are transported offsite and sent to approved recycle and disposal facilities. In 2011, over 17 tonnes of waste was collected. Items included paint, solvents and flammable liquids.

- **Oil Filters** - these are shipped offsite and the used oil in the filters is recovered.

- **Used Motor Oil** - used motor oil is recycled on site and processed into Syncrude crude oil.

- **Other Waste Hydrocarbons and Solvents** - These are recycled on site and reprocessed into Syncrude crude oil.

- **Cardboard and Paper** - Recycling bins are located throughout Syncrude to promote recycling.

- **Cell Phones** - All cell phones, cell phone batteries and chargers are collected on site and sent for recycling.

- **Beverage Containers** - Beverage containers are returned to a recycling depot and all cash from container deposits is donated to the United Way.

- **Printer Cartridges** - Used printer cartridges are sent back to the vendors for recycle.

- **Fluorescent Tubes** - Fluorescent tubes are crushed and the crushed glass is sent to a retort for mercury recovery; the aluminum end caps are separated and recycled.

- **Aerosols** - Any gases remaining in aerosols are disposed of or recycled appropriately and the metal containers are recycled.

- **Electronics** - all discarded computers and related equipment, and other electronics, are sent for offsite recycling.

- **Plastic and Steel Drums** - Reusable drums are returned to the original suppliers for recovery of residual deposits and recycling of the drums.

<table>
<thead>
<tr>
<th>Major waste recycled or reused — solid (tonnes)(^1)</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9,150</td>
<td>20,563</td>
<td>32,663</td>
<td>32,923</td>
<td>23,172</td>
</tr>
<tr>
<td>Description</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>2015</td>
<td>2016</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Minor waste recycled or reused — solid (tonnes)^2</td>
<td>255</td>
<td>210</td>
<td>270</td>
<td>503</td>
<td>214</td>
</tr>
<tr>
<td>Major waste recycling or reused — liquid (m³)^3</td>
<td>3,439</td>
<td>3,439</td>
<td>3,992</td>
<td>3,172</td>
<td>1,700</td>
</tr>
<tr>
<td>Waste — solid hazardous or potentially hazardous materials sent for off-site treatment or destruction (m³)</td>
<td>11</td>
<td>68</td>
<td>11</td>
<td>110</td>
<td>252</td>
</tr>
<tr>
<td>Waste — liquid hazardous or potentially hazardous material sent for off-site treatment or destruction (m³)</td>
<td>4.6</td>
<td>2.1</td>
<td>1.4</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Waste disposal — on-site industrial, non-hazardous (tonnes)</td>
<td>20,431</td>
<td>21,775</td>
<td>41,278</td>
<td>17,807</td>
<td>38,335</td>
</tr>
<tr>
<td>Waste disposal — on-site sanitary, non-hazardous (tonnes)</td>
<td>2,137</td>
<td>2,354</td>
<td>1,027</td>
<td>720</td>
<td>16</td>
</tr>
<tr>
<td>Waste disposal — off-site sanitary, non-hazardous (tonnes)^4</td>
<td>—</td>
<td>—</td>
<td>874</td>
<td>1,098</td>
<td>2,603</td>
</tr>
</tbody>
</table>

1. Includes catalyst, scrap metal, tires, conveyor belting and batteries.
2. Includes solid recycled materials such as aerosols, oil/fuel filters, oily rags, refrigerant, plastic and metal drums, electronic waste, fluorescent tubes, kitchen grease, paper/cardboard/newsprint, beverage containers and printer cartridges.
3. Includes used oil and used solvents.
4. In August of 2010, Syncrude began sending most of the sanitary waste generated at Syncrude to the Regional Municipality of Wood Buffalo's landfill.
Melissa Blake  
Mayor, Regional Municipality of Wood Buffalo

“...The property taxes paid by Syncrude and other industry members enable us to do tremendous things in terms of the infrastructure.

“At the municipality, we hope to achieve sustainability by making sure today's decisions don't compromise future choices. This has been a challenge as Wood Buffalo has grown tremendously in the past decade and there's no sign of this slowing down. Syncrude has been a community mainstay long before this period and continues to help us with decisions on everything from the municipal development plan to city centre redevelopment to bus lanes that move commuters more quickly and efficiently. Syncrude is at the table and is making a difference in how we execute those plans.

The property taxes paid by Syncrude and other industry members enable us to do tremendous things in terms of the infrastructure that's required. The other area where Syncrude has helped is through investing directly in the community. Facilities such as the Syncrude Sport and Wellness Centre and the Syncrude Timberlea Athletic Park improve the quality of life in the community.”

Community Involvement

Performance Overview

- Distributed $6 million in total donations in key areas in 2012
- Among the recipients of key investments were MacEwan University's Bachelor of Science in Engineering Transfer program, Wood Buffalo Food Bank, Fort McMurray Public Schools, Girls Inc. of Northern Alberta and the Wood Buffalo Dolly Parton Imagination Library
- Corporate campaign in 2012 recognized employee volunteers and engaged employees in voting a total of $50,000 in donations for their charities of choice

Corporate Giving Policy

In order to enrich the lives of our employees and improve the well-being of the communities where our people live and we do business, Syncrude provides funds to support community activities meeting specific criteria. Our corporate giving is designed to help us continue to earn our social license to operate and enhance our corporate reputation as well as our ability to attract and retain qualified employees.

Complete details on our policy and program guidelines are available at www.syncrude.com/community.

Focus Areas for Giving
Syncrude's giving in the Wood Buffalo region focuses on participating in community initiatives that help improve quality of life and enhance employee retention. In Edmonton, our giving focuses on initiatives which serve that community and also benefit people living in northern Alberta communities, for example, health care services. Investments are made in both markets that help build training and education capacity to support long-term recruitment needs.

### Corporate Donations

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corporate giving</strong> ($ millions)</td>
<td>3.2</td>
<td>4.3</td>
<td>5.0</td>
<td>5.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

1. Includes donations made under the Community Investment Program, Aboriginal Community Investment Program, sponsorships and gifts-in-kind.

### Major Donation Contributions

More than 170 organizations benefited from our community investment program in 2012. These included:

- **$1 million over four years to help establish a new Science and Technology Centre at Fort McMurray's Father Patrick Mercredi High School.** The project is valued at $4 million and aims to help local students develop technology skills needed by local employers. Two new labs focused on engineering technologies and industrial trades will provide hands-on learning opportunities that will give students a competitive advantage when applying for post-secondary training and apprenticeships.

- **$250,000 to MacEwan University to support the Bachelor of Science in Engineering Transfer Program.** This program enables the first year of a Bachelor of Science in Engineering degree to be taken at MacEwan. Upon successfully completing the first year, students are guaranteed entrance to the second year program at the University of Alberta.

- **$300,000 to the Wood Buffalo Dolly Parton Imagination Library.** The Imagination Library fosters a love of reading among preschool children by providing them with a free book every month from birth to the age of five. Started in 1996 by country music star Dolly Parton, the program operates in more than 900 communities across Canada, the United States and the United Kingdom. In Wood Buffalo, 5,000 preschool children are eligible, making it the largest Imagination Library initiative in Canada.

- **$65,000 to the Wood Buffalo Food Bank.** Each year, Syncrude sponsors the annual food bank drive. Since 2005, Syncrude has contributed a total $425,000.

- Other organizations and initiatives we continue to support include: the Northern Lights Health Foundation, the Stollery Children's Hospital Foundation, Keyano College, Ronald McDonald House Northern Alberta, Compassion House Foundation, MacDonald Island Park, Vista Ridge All Seasons Park and KidSport. More information is available in our 2010-11 Sustainability Report.

### Employees Respond to United Way Campaign

Syncrude employees once again responded generously to Fort McMurray's annual United Way campaign in 2012, helping the city retain its status as Canada's most giving United Way community on a per capita basis for seven consecutive years. Syncrude's record-breaking workplace campaign raised $2.2 million.
Campaign Salutes Community Volunteers and Engages Employees in Corporate Giving

A 2012 campaign to recognize and promote employee volunteerism also succeeded in its secondary goal of engaging employees in learning about the work of community not-for-profit agencies through a $50,000 choose-your-charity give-away contest. Nearly 1,600 employees participated in the on-line campaign, selecting the Fort McMurray SPCA as the $25,000 winner, and five other agencies as recipients of $5,000 each; they are the Centre of Hope, the Fort McMurray Chinese-Canadian Cultural Society, Sanatan Mandir Cultural Society, Santas Anonymous and the Wood Buffalo Educare Society.

Good Neighbours Program Benefits Local Charities

Syncrude’s Good Neighbours program recognizes and incents employees to engage in community volunteerism by awarding $500 grants to the organizations for which they volunteer. In 2012, a total of $116,000 was awarded to 70 not-for-profit organizations. Many of the same organizations also shared in a total of $80,000 in Good Neighbours busing grants ($2,000 each), which help offset the cost of travel to out-of-town events, such as sports tournaments. Click here for more information on this program.
“I've been with Syncrude for over 10 years and can attest that the safety of employees is the organization's most important priority. I've worked in safety for three years and prior to that I was a front line supervisor, so safety has always been at the forefront of everything I do. Safety is everybody's responsibility and it's something that we have to make sure is a fundamental cultural value; that everyday workers are looking out for one another and that leaders are ensuring their workers are following the proper procedures and requirements. At the same time, employees are encouraged to provide feedback to their leaders about what is working well or what may need improving. It's great to work for a company that listens and has the best interests of its employees in mind.”

People

Performance Overview

- Recognized as one of Alberta's top employers and best workplaces
- $1 million in scholarships awarded to children of employees
- President and CEO holds town hall meetings with employees

Our Commitment

Syncrude's employees are key to our success and are our most valued asset. We encourage their achievement of high quality results by creating an environment that fosters teamwork, mutual respect and measured risk-taking. We make every effort to acknowledge their contributions and celebrate successes through highly competitive compensation, recognition and development programs.

Labour Pool Initiatives

High School Technology Centre

Supported by Syncrude, a technology centre that opened in September 2011 at Fort McMurray's Father Patrick Mercredi High School is enabling students to access equipment and learning opportunities not usually offered at the high school level. The centre gives the students insight into various engineering specialties and works to influence their future career path decisions. In particular, students can receive credits toward a high school diploma while, at the same time, have the opportunity to meet requirements for a 4th Class Power Engineering certificate.
Apprenticeships

Apprenticeships in recognized trades and technologies can be accessed through Syncrude directly or via two widely available programs in which Syncrude participates. The Community Cooperative Apprenticeship Program is an industry-driven education partnership providing training through annual rotating work placements. The Registered Apprenticeship Program is offered to high-school students in the form of work experience courses, Career and Technology Studies courses, and part-time employment.

Introduced in 2009, the Syncrude Aboriginal Trades Preparation Program prepares participants to pursue trades apprenticeship training through academic upgrading and work experience placements at our operation. Upon successful completion, students are eligible to become indentured apprentices at Syncrude which is the lead sponsor. The program is available at Keyano College in Fort McMurray, as well as learning centres in Janvier, Fort Chipewyan and Fort McKay. Twenty-three students graduated from the program in 2012. It is currently being restructured to enhance learning and program delivery.

Co-Op/Discipline Students

Every year, Syncrude provides work terms of varying lengths for about 200 co-op/discipline students, who come to Syncrude from post-secondary schools across Canada. About 60 students are on-site at any given time. During their time with Syncrude, the students gain valuable work experience in their field of study, and work alongside knowledgeable experts. In addition to competitive wages, the students also receive paid transportation to and from Fort McMurray; along with paid accommodation, internet and cable.
Syncrude Higher Education Awards Program

Children of Syncrude employees can qualify for up to $2,400 for each year of their post-secondary degree or diploma education. About $1 million in program scholarships was granted to 558 applicants (returning and new) in 2012.

CEO Engages with Employees

Syncrude President and CEO Scott Sullivan engaged with the company’s entire employee population over the course of 28 meetings held in early 2012. The sessions were designed to foster feedback from employees as much as share information about corporate direction, goals and challenges. Topics included commuting, compensation and benefits, career development, plant reliability, environmental performance and future growth plans. Management was also able to update employees on the progress made regarding issues raised in the 2011 forums.

Workforce by the Numbers

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total permanent workforce</strong></td>
<td>5,284</td>
<td>5,580</td>
<td>5,689</td>
<td>5,515</td>
<td>5,083</td>
</tr>
<tr>
<td>% under age 20</td>
<td>0.4</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>% age 20-24</td>
<td>8.0</td>
<td>7.6</td>
<td>6.9</td>
<td>5.2</td>
<td>4.7</td>
</tr>
<tr>
<td>% age 25-29</td>
<td>13.1</td>
<td>13.9</td>
<td>14.2</td>
<td>14.3</td>
<td>14.2</td>
</tr>
<tr>
<td>% age 30-34</td>
<td>12.2</td>
<td>14.0</td>
<td>14.1</td>
<td>14.5</td>
<td>15.1</td>
</tr>
<tr>
<td>% age 35-39</td>
<td>11.6</td>
<td>11.5</td>
<td>12.1</td>
<td>11.8</td>
<td>12.1</td>
</tr>
<tr>
<td>% age 40-44</td>
<td>12.3</td>
<td>12.1</td>
<td>12.0</td>
<td>12.4</td>
<td>13.0</td>
</tr>
<tr>
<td>% age 45-49</td>
<td>14.2</td>
<td>14.1</td>
<td>13.7</td>
<td>14.0</td>
<td>14.4</td>
</tr>
<tr>
<td>% age 50-54</td>
<td>16.2</td>
<td>15.2</td>
<td>15.2</td>
<td>14.8</td>
<td>15.7</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Employee Productivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thousand barrels of crude oil per employee</td>
<td>20,029</td>
<td>18,309</td>
<td>18,815</td>
<td>19,075</td>
<td>20,637</td>
</tr>
<tr>
<td>Average employee service (in years)</td>
<td>10.1</td>
<td>9.4</td>
<td>9.2</td>
<td>9.6</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>Leadership Development</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of leaders completed Leadership Excellence Program</td>
<td>78</td>
<td>53</td>
<td>57</td>
<td>60</td>
<td>59</td>
</tr>
<tr>
<td>% of leaders completed Diversity Workshop</td>
<td>55</td>
<td>61</td>
<td>64</td>
<td>69</td>
<td>61</td>
</tr>
<tr>
<td>% of leaders completed Harassment &amp; Discrimination Workshop</td>
<td>53</td>
<td>51</td>
<td>64</td>
<td>73</td>
<td>65</td>
</tr>
<tr>
<td><strong>Diversity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aboriginal representation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Employees</td>
<td>435</td>
<td>479</td>
<td>484</td>
<td>492</td>
<td>474</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>% of permanent Syncrude workforce</td>
<td>8.1</td>
<td>8.4</td>
<td>8.4</td>
<td>8.6</td>
<td>9.1</td>
</tr>
<tr>
<td>% of new hires</td>
<td>6.7</td>
<td>10.8</td>
<td>10.4</td>
<td>15.4</td>
<td>9.8</td>
</tr>
<tr>
<td>Aboriginal leaders (% of permanent Syncrude leaders)</td>
<td>5.6</td>
<td>5.9</td>
<td>5.8</td>
<td>5.5</td>
<td>6.0</td>
</tr>
</tbody>
</table>

**Female representation:**

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>991</th>
<th>1,036</th>
<th>1,011</th>
<th>950</th>
<th>958</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of permanent Syncrude workforce</td>
<td>19.3</td>
<td>19.2</td>
<td>18.9</td>
<td>18.6</td>
<td>18.8</td>
</tr>
<tr>
<td>Female leaders (% of permanent Syncrude leaders)</td>
<td>10.6</td>
<td>9.8</td>
<td>10.6</td>
<td>11.8</td>
<td>12.7</td>
</tr>
</tbody>
</table>

**Attrition (% of Syncrude workforce)**

| All employees, including retirements | 10.6 | 9.0  | 8.0   | 5.5  | 14.2 |
| Employee initiated termination | 7.2  | 4.2  | 4.0   | 2.6  | 7.4  |
| Retirements | 2.1  | 3.5  | 2.7   | 1.9  | 5.8  |
| Aboriginal | 11.9 | 9.8  | 10.2  | 5.6  | 10.4 |
| Female | 12.6 | 10.2 | 10.1  | 6.5  | 12.7 |
| Trades and operators | 10.0 | 9.1  | 6.9   | 4.9  | 12.1 |
| Administrative, professional and technical | 11.3 | 8.9  | 9.4   | 6.3  | 16.1 |

**Employee & Family Assistance Program (EFAP) utilization**

| # of clients as % of Syncrude workforce | 7.3  | 13.7 | 16.7  | 18.5 | 16.3 |

**Training**

| % hours in training per employee/per annum | 1.3  | 1.1  | 1.1   | 1.0  | 0.8  |

**Employee recognition**

| # of recognitions to employees\(^1\) | 10,902 | 12,143 | 5,912 | 6,415 | 5,081 |

**Ethics**

| Anonymous submissions to EthicsPoint | 10  | 11  | 16  | 13  | 11  |

1. Includes service and safety awards.

### Scholarships, Bursaries and Endowments

<table>
<thead>
<tr>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual scholarships, bursaries and endowments ($)</td>
<td>858,000</td>
<td>1,018,000</td>
<td>1,054,800</td>
<td>940,415</td>
</tr>
</tbody>
</table>
Numbers of employee student scholarships

<table>
<thead>
<tr>
<th></th>
<th>443</th>
<th>428</th>
<th>461</th>
<th>516</th>
<th>558</th>
</tr>
</thead>
</table>

Number of tuition refunds to Syncrude employees

<table>
<thead>
<tr>
<th></th>
<th>155</th>
<th>82</th>
<th>84</th>
<th>144</th>
<th>130</th>
</tr>
</thead>
</table>

**Corporate Awards**

Syncrude is proud to have received several corporate awards in 2012. These reinforce our efforts to be a favoured employer and a responsible oil sands producer.

**Canada’s Top Employers of Young People 2012** –
adjudicators cited our apprenticeship, training & development programs, summer work placements for high school students, mentoring program and excellent starting benefits.

**Alberta’s Top Employers** – Syncrude was cited for hiring incentives, flexible health benefits, savings plans, maternity leave coverage, helping employees balance work and personal life, and encouragement of employee development through training, mentoring and scholarships.

**Alberta Venture Magazine Best Workplaces Awards 2012**

– Syncrude was named Best Workplace for Volunteerism and Community Involvement, and was also a runner-up in the Best Workplace for Diversity category. Judges highlighted Syncrude’s investment of more than $23 million in community projects since 2006, as well as the Good Neighbours grants program and the employee Get Effect giving campaign. As a runner-up in the diversity category, Syncrude was recognized for its Aboriginal relations program.

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Labour Relations

Performance Overview

- Investments to Keyano College include $1 million towards Oilsands Power & Process Engineering Lab
- $1 million donation to Father Mercredi High School Technology Centre develops future workforce
- Continued joint industry and union collaborations to address future labour shortages

Our Commitment

When Syncrude has a need for skilled labour, our commitment is to employ Albertans and Canadians first. If unions are unable to source Canadian workers, they will then seek tradespeople in the United States, and then, if needed, other countries. Syncrude makes every effort to treat these workers with respect and to instill our three key values of safety, productivity and schedule among all those who contribute to our project-related work.

Addressing the Availability of Skilled Labour

In addition to our regular workforce, Syncrude relies on a large contingent of skilled tradespeople who contribute to many functions at our site, including major maintenance turnarounds and construction of new projects. These workers are primarily sourced through the Building Trades of Alberta, which represents 16 trade unions and 60,000 union members, and has the ability to draw from union halls across Canada. In the event that workers cannot be found in Canada, the Building Trades then sources from the United States and Ireland where skills and certifications are comparable to those in Canada.

Our demand for skilled tradespeople is taking place in a highly competitive environment for labour resources. Overall, labour needs at Syncrude and elsewhere in Alberta and Canada are expected to grow significantly between 2013 and 2020. At the same time, many workers will retire during this period. Without active labour market intervention, demand will likely exceed market supply capacity. By actively working with our partners, we are pursuing a number of initiatives to further develop more skilled workers in Canada. As well,
we continue to focus on making strategic investments that encourage youth to choose trades as a career, such as the Father Patrick Mercredi High School Science and Technology Centre, CAREERS: The Next Generation, and program development at Keyano College.

Management Approach

The Syncrude Labour Relations Executive Steering Committee, composed of senior Syncrude leaders, assesses our labour workforce needs and develops short- and long-term strategies to meet those needs. This committee also oversees Syncrude's engagement with several external stakeholder organizations that are working to influence labour market outcomes. They include:

**Construction Owners Association of Alberta**

The COAA provides leadership to enable the Alberta heavy industrial construction and industrial maintenance industries to be successful in safe, effective, timely and productive project execution. A Syncrude leader serves on its Board of Directors.

**National Owners Forum**

This group of major construction project owners from across Canada, including Syncrude, developed a five-year strategy for 2011-16 to cooperatively address the workforce challenges facing the construction industry. The strategy set out a 26-point implementation plan for owners, industry, educators and trainers, governments and other stakeholders to address the issues identified by the group. View the strategy.

**Alberta Owners/Building Trades Canadian Executive Board Partnership**

This group is comprised of construction project owners and labour representatives (unions). It is co-chaired by a Syncrude leader on behalf of the project owners and by the president of the Canadian Executive Board on behalf of the union affiliates. The group's vision is for Alberta to have a safe, effective, productive and high value-added construction and maintenance industry. Toward this, it engages in dialogue, information sharing and the exploration of ways to effect continuous improvement. It develops and implements strategies for priority areas and collaborates with others on complementary initiatives.

**Alberta Council of Turnaround Industry Maintenance Stakeholders (ACTIMS)**

ACTIMS is comprised of owners, labour providers and contractors. If labour cannot be secured in Canada, it works to ensure an adequate and properly trained temporary foreign workforce for major industrial maintenance turnarounds in Alberta. The group is working to identify needed worker volumes, skill sets and qualifications; improve communication with labour providers regarding project plans and labour needs; develop standardized worker training and worksite protocols; and recruit new apprentices.

**Construction Industry Stakeholders Association of Alberta (CISAA)**

CISAA is similar to ACTIMS in its composition and approach, but focuses on major industrial construction work. It is chaired by a Syncrude leader.

Finding Common Ground

The construction industry stakeholders discussed earlier agree on the common themes that need to be addressed to provide a sustainable construction workforce that is able to meet short-, medium- and long-term industry needs. Working committees from the various groups focus on these issues and, where there is opportunity, federal and provincial agencies are also engaged in sustainment work. Themes include:
continually monitor supply and demand situation;
refine demand forecasting and work specifications for skilled trades;
implement initiatives to improve workforce productivity;
enhance interprovincial labour mobility;
train more apprentices & increase training capacity;
enhance outreach about skilled trades careers to junior high & high schools;
enhance recruitment from non-traditional sources: women and Aboriginals;
improve access to temporary foreign workers;
increase immigration of skilled workers;
spread workloads through modularization to off-site (i.e.: less remote) fabricators in different jurisdictions; and
coordinate turnaround activities to minimize labour demand conflicts.

Treatment of International Workers

Skilled tradespeople sourced from outside of Canada and who work at Syncrude are protected by all Canadian labour regulations, as well as the respective collective agreements Syncrude contract companies have with various unions. They are treated and compensated the same as any domestic worker, and the federal government provides assurance of this through unannounced visits to the workplace. Sponsoring unions also conduct their own independent audits and assessments.
To help properly manage the issues associated with growth, it's integral the municipality walks hand in hand with industry.

Stakeholder Relations

Performance Overview

- Liaising with Alberta Government regarding our proposed tailings management technology platform
- Continued participation in the Oil Sands Community Alliance (formerly the Oil Sands Developers Group); active on committees related to transportation, health care, municipal affairs and Aboriginal relations
- Contributing funds to the Alberta Conservation Association to protect and enhance the Owl River

Our Communications and Stakeholder Relations Policy

Attaining objectives in social, economic and environmental performance from current operations and potential growth opportunities can only be achieved by earning and maintaining the support of our stakeholders.

Syncrude will actively seek to establish long-term relationships with our stakeholders through consultation, collaboration and the provision of information, and will manage these processes with honesty and integrity.

Syncrude will foster an environment that actively seeks stakeholder ideas, input and feedback in order to develop mutual trust and cooperation. We will participate in collaborative stakeholder processes to promote sustainable development and manage the cumulative impacts of industrial development. In addition, stakeholders will be encouraged to define the manner in which they wish to be consulted. Those acting on behalf of Syncrude will be receptive to stakeholder input and, where appropriate, will act on it, even if it necessitates changing our plans. When disagreements occur and remain unresolved, Syncrude and its employees will always demonstrate respect for the views presented.

Syncrude will engage with employees, contractors and the public, including governments and media, on a professional level, and be responsive to issues and provide information and insight as appropriate. Syncrude will also take a proactive approach to these relationships, as required, to ensure necessary information and understanding is fostered.
Employees are a key stakeholder group for Syncrude. As such, we are committed to fully communicating business-related information that provides employees with an understanding of goals, plans and performance that enables them to function effectively in their roles.

Syncrude is committed to encouraging and sustaining the growth and well being of the communities in which it does business and in which our employees live. As such, Syncrude will make contributions to projects that enhance the quality of life, primarily within the Regional Municipality of Wood Buffalo and northeastern Alberta.

**Stakeholder Engagement Cycle**

**Direct Stakeholder Engagement**

Syncrude directly engaged with the following groups during the reporting period:

**Alberta Conservation Association**

This group receives funds from Syncrude to protect and enhance the riparian zone and streambed of the Owl River, near Lac La Biche. This work constitutes compensation, as per our Fisheries Act approval, for Harmful Alteration, Disruption or Destruction of fisheries habitat (known as HADD) incurred as part of the Beaver Creek Reservoir diversion. This diversion is in support of our Base Mine Lake program, with which we are capping mature fine tails with fresh water.

**Government of Alberta**
In response to the government's Directive 074 on tailings management, Syncrude is liaising with officials at Alberta Environment and the Energy Resources Conservation Board about our proposed tailings management technology platform.

**Regional Municipality of Wood Buffalo**

Syncrude, along with two other oil sands operators, engaged with the Municipality to advance a proposal for the development of express bus lanes entering Highway 63 from two Fort McMurray subdivisions. The proposal was successful and one bus lane is now operating; the other remains under discussion.

Syncrude is also involved on the Municipality's Stakeholder Advisory Committee. This group meets several times per year to ensure exchange of information on key regional topics such as transportation, infrastructure planning, the Municipal Development Plan and sustainability initiatives. It is managed by the Municipality and includes participants from the Chamber of Commerce and the Oil Sands Developers Group.

**Local School Boards and Keyano College**

Syncrude had discussions with representatives from the local education community to learn about program and infrastructure need and opportunity areas. The dialogue helped identify projects Syncrude is supporting through our Community Investment program (see Community Involvement chapter). Syncrude employees are also active on local boards. Kara Flynn, Syncrude Vice President of Government and Public Affairs, serves as the Chair of the Keyano Board of Governors, and Jeff Thompson, Business Controls Advisor, serves as the Chair of the Board of Trustees for the Fort McMurray Public School Board.

**Oil Sands Community Alliance**

Syncrude engaged with various stakeholders during the reporting period through our participation in the Oil Sands Community Alliance (OSCA), formerly the Oil Sands Developers Group, which is a non-profit, industry-funded association that works to foster responsible oil sands development. Syncrude provides leadership to OSDG at the Board and Committee level to identify, advocate and champion solutions on various issues related to the regional impacts of oil sands development. Kara Flynn, Syncrude Vice President of Government and Public Affairs, serves as Vice-Chair of the OSDG Board. Syncrude employees also chair, or are active, on the following committees:

- **Transportation** works to identify issues and needs related to impacts of resource development on transportation within the Regional Municipality of Wood Buffalo, and recommend and implement strategies to address these. Syncrude is one of two OSDG representatives on the Government of Alberta's recently established Transportation Coordinating Committee, which is working under Ministerial appointment to identify long-term transportation needs in the Athabasca Oil Sands region.

- **Health Care** aims to promote mutual understanding of health care delivery issues and oil sands development impacts and to explore possible synergies between OSDG members and Alberta Health Services. The committee is currently seeking clarity from the Alberta government on the issue of health impacts caused by blowing tailings sands, and how this issue will be dealt with through the Alberta Occupational Health and Safety Act.

- **Municipal Affairs** works to develop sustainable policy frameworks in Wood Buffalo by engaging and partnering with a variety of stakeholders, including the Regional Municipality of Wood Buffalo, the Government of Alberta, the Fort McMurray Chamber of Commerce, the Canadian Association of Petroleum Producers, and the Canadian Property Tax Association.

- **Aboriginal Affairs** identifies issues related to the impacts of resource development on Aboriginal Peoples living within the Regional Municipality of Wood Buffalo, and recommends strategies to
address Aboriginal issues.

- Co-generation/Transmission looks at accessing and addressing the electricity transmission needs of the oil sands producers in region and its linkages throughout the province. The committee provides a forecast report each year on co-generation and power infrastructure.

- Communications strives to create understanding and support for the OSDG among key stakeholders and to ensure that the OSDG is a credible, accurate, current and accessible source of information on oil sands development.

- Regional Environmental & Regulatory Affairs provides an industry member forum to discuss issues related to potential environmental impacts of oil sands development within the Regional Municipality of Wood Buffalo. It develops common industry positions on environmental and regulatory issues that arise over time.

**The Canadian Association of Petroleum Producers**

The Canadian Association of Petroleum Producers (CAPP) is the voice of Canada's upstream oil, oil sands and natural gas industry. It works to enhance the economic sustainability of the Canadian upstream petroleum industry in a safe and environmentally and socially responsible manner, through constructive engagement and communication with governments, the public and stakeholders in the communities in which we operate. Syncrude employees are active on a number of committees.

CAPP also led the work toward the creation of Canada's Oil Sands Innovation Alliance (COSIA), whose mandate is to accelerate the pace of improvement in environmental performance in Canada’s oil sands through collaborative action and innovation. The alliance, of which Syncrude is a member, focuses on the four environmental priority areas of tailings, water, land and greenhouse gases.

CAPP also leads industry efforts with respect to influencing climate change policy at the provincial and federal levels.

**The Mining Association of Canada**

The Mining Association of Canada (MAC) works to ensure the continued strength and sustainability of Canada’s mining industry by representing a broad array of organizations spanning many sectors, either directly or indirectly associated with mining and mineral processing. Peter Read, Syncrude Vice President of Strategic Projects, serves on its Board of Directors and Governance Team.

MAC executes much of its work through committees comprising functional experts from across the mining industry. They provide oversight and governance that guide mining-related policy and support continued innovation and alignment around programs such as the Towards Sustainable Mining (TSM) responsible development initiative. Kara Flynn, Syncrude Vice President of Government and Public Affairs, chairs the Public Affairs Committee. Syncrude employees are also active on the TSM Initiative Leaders, Environment and Science committees.

In the reporting period, MAC engaged with the Government of Canada on proposed changes to the Fisheries Act and the Canadian Environmental Assessment Act.
Tabitha Qintal
Apprentice Instrumentation Technician

“I found it was a lot of hard work and it took a lot of dedication to get through it, but it’s paid off. It’s been absolutely rewarding.”

“I heard about the Syncrude Aboriginal Trades Preparation Program at Keyano College through my Aunty Marty who also works at the company. I had brought the kids over to her place for a play date and she casually brought it up that Syncrude was offering this course where you can learn a trade, get a paid work placement, and if successful, get a guaranteed job at the company when you graduate.

I found it was a lot of hard work and it took a lot of dedication to get through it, but it's paid off. It's been absolutely rewarding and, as a graduate, I would definitely recommend the program to others. I love getting up every morning and coming to work.”

Aboriginal Relations

Performance Overview

- Regular consultation and community engagement meetings were held with all five of the region's First Nations and several Métis locals
- Regular contact with Aboriginal contractors was maintained, and issues and concerns were promptly addressed
- Elders advisory tours on Syncrude reclamation projects were held with region's First Nations and Métis locals

Aboriginal Relations Policy, Program & Governance

Syncrude's policies pertaining to our relationships with Aboriginal stakeholders are incorporated into our overarching Communications and Stakeholder Relations Policy and Stakeholder Consultation Guidelines.

The goals of our Aboriginal Relations Program are to:

- be a corporate leader in Aboriginal Relations and employment and a sustainable and socially responsible leader and employer in the oil sands industry;
- attract and retain qualified employees from local Aboriginal communities to assist in meeting our workforce needs;
- be an employer of choice for Aboriginal people;
- be a corporate leader in Aboriginal business development;
achieve effective, two-way relationships and consultation with local Aboriginal stakeholders;

- focus community investment initiatives on education and recruitment, community relations, cultural retention, and Aboriginal leadership;

- ensure local Aboriginal communities have the capacity to engage with Syncrude regarding consultation, employment, business, and environmental and socio-economic impacts from our projects; and

- ensure Syncrude's environmental programs are designed to mitigate impacts to traditional land uses, incorporate traditional knowledge where possible and are well understood by our stakeholders.

Progress toward these goals is stewarded by Syncrude's Aboriginal Relations Steering Committee, whose mandate is to ensure that Syncrude delivers on its six key commitment areas for Aboriginal Relations: Corporate Leadership, Employment, Business Development, Education, Community Development and the Environment. The Committee includes senior managers and advisors from throughout Syncrude who meet quarterly to guide and champion strategies to ensure positive outcomes for Aboriginal stakeholders. An Aboriginal Relations team supports the Committee; the team manages the day-to-day interactions and relationships with local stakeholders.

### Our Approach to Aboriginal Consultation

Syncrude operates on the traditional lands of five First Nations. Since our earliest days, we have, where possible, accommodated the interests of the local First Nations and Métis Locals. We endeavour to earn support through relationship-building and formal agreements that are aligned with our mutual interests, mitigate concerns, provide benefit to affected communities, and are in accord with Canadian law.

Our engagement with those affected by our operations is ongoing, and in specific cases is also triggered by regulatory applications that fall under the following laws and under which Syncrude has delegated the procedural aspects of consultation:

- Oil Sands Conservation Act;

- Alberta Environmental Protection and Enhancement Act, including Closure and Reclamation Plan renewals;

- Alberta Water Act;

- Federal government approvals or amendments (e.g.: Fisheries Act or Canadian Environmental Assessment Act); and

- Licenses or permits that fall outside of existing Mineral Surface Leases (e.g.: winter drilling programs).

In 2012, consultation continued on the Base Mine Lake project. Syncrude also released a public disclosure document on the Mildred Lake Extension (MLX) project and announced our intentions to begin stakeholder consultations. Initial project scoping is underway and we anticipate filing a formal regulatory submission in 2014.

### Our Aboriginal Workforce

Syncrude was successful in attracting 32 new permanent Aboriginal employees in 2012. Attrition among Aboriginal employees was lower than overall workforce attrition, at 10.4 percent. As at year-end 2012, our 474 Aboriginal employees comprised 9.1 percent of our total workforce, an increase of 0.5 percent over 2009.
Ongoing recruitment initiatives, such as the day-to-day work of Syncrude's Aboriginal Recruitment Specialist, Syncrude's rotational employment program in several Wood Buffalo Aboriginal communities, and Syncrude's participation in the Aboriginal Human Resource Council's Inclusion Works National Career Fair will help maintain strong levels of Aboriginal hiring. Workforce development initiatives, such as our work to support education and trades training programs, also play an important role in developing the next generation of Aboriginal employees.

**Aboriginal Workforce**

In 2012, Aboriginal people represented about 10 percent of our new employees.

**Business Development Reaches $1.8 Billion**

Syncrude recorded strong performance for Aboriginal procurement in 2012, with a total business volume of $147 million with companies owned by Aboriginal entrepreneurs and First Nations in the Wood Buffalo region. This brought to $1.8 billion the total cumulative procurement since 1992, when Syncrude established a minimum annual target of $30 million. Our policy requires an Aboriginal business to be 51 percent owned by a First Nation, Métis Local or Aboriginal person. The Aboriginal owner must also be in control of the operations on a day-to-day basis.

**Procurement with Aboriginal-Owned Companies**
The cumulative total for Syncrude business with First Nations- and Métis-owned companies since 1992 is over $1.7 billion.

**Investing in Strong, Healthy Communities**

Syncrude invested over $600,000 in Aboriginal community projects during 2012. Among the projects we supported:

- The National Aboriginal Achievement Awards (now the Indspire Awards) and the NAAF Education Series Career Fair for Aboriginal high school students.
- The Science Alberta Foundation. It will produce classroom science learning tools for Aboriginal schools in the Wood Buffalo region and beyond.
- Athabasca Tribal Council Regional Gathering. This event celebrates Aboriginal culture and brings together First Nations communities to promote better understanding and appreciation of traditional values.
- Alberta Foundation for the Arts Travelling Exhibition (TREX) Program. It features works by Aboriginal artists in an exhibition that travels to various communities across Alberta.
- The WISEST and DiscoverE programs with the University of Alberta School of Engineering, which will now reach out to Aboriginal communities in northern Alberta.

**Syncrude Leaders Serve on National Boards**

Two Syncrude leaders continued to serve on the governing boards of national Aboriginal organizations during the 2012 reporting period. Dan Brown, Manager of Process Control and Automation, volunteers for the Aboriginal Human Resource Council, and Kara Flynn, Vice President of Government and Public Affairs, volunteers for the Canadian Council for Aboriginal Business.

**Syncrude Accredited Through PAR Program**

The Canadian Council of Aboriginal Business Progressive Aboriginal Relations (PAR) Program establishes a framework for companies to measure progress on developing progressive Aboriginal relations. It considers corporate efforts in Aboriginal employment,
Aboriginal business development, building individual capacity and enhancing relations with Aboriginal communities. Syncrude is the only oil sands company holding Gold Level PAR distinction, and has been accredited five times.

**Syncrude Aboriginal Review**

Published annually, Syncrude's Aboriginal Review provides a comprehensive overview of our Aboriginal Relations work and our progress in stewarding to our key commitment areas of corporate leadership, employment, business development, education, community development and the environment. View the 2012 report here. The magazine has been recognized internationally with a MarCom Platinum Award and an Award of Excellence from the APEX Awards for Publication Excellence.
Safety and Health

Performance Overview

- Recordable incident rate remains stable; focus in 2013 on more effective hazard recognition
- Employees achieved 11 million hours (361 days) between lost-time incidents; 5.9 million hours employee and contractor combined
- Charged with six counts under the Occupational Health and Safety Act, relating to June 2010 incident; court hearings proceeding
- Syncrude team overall winner at provincial mine rescue competition

Safety & Health Management System

We are committed to achieving year-over-year improvement in safety performance towards an injury-free workplace.

Towards this, Syncrude is in the process of fully implementing the ExxonMobil Operations Integrity Management System (OIMS) as our primary tool for managing personnel and process safety, and workforce health. The new system is expected to be fully in place by the end of 2013. It focuses on identifying and managing hazards and regulatory compliance through more clearly defined work processes and workforce responsibilities.

Oil Sands Industry Injury Comparison
Incidents Highlight Need for Constant Diligence

In June 2010, a fire occurred in an operating unit at our Mildred Lake facility. Four contractors and one employee were injured in the incident. Syncrude was charged with six counts under the Occupational Health and Safety Act. The case has not yet been resolved. We are committed to providing a safe workplace, and have applied the lessons learned by revising operating manuals and procedures.

The government completed their investigation into a second incident in 2010 when a contract worker was found unresponsive at a Syncrude construction site. The worker was pronounced dead at the scene. The investigation concluded that, while the incident was work related, Syncrude’s safety procedures were appropriate and the company was not charged.

Emergency Response Preparation

Syncrude’s emergency response personnel deal with many different kinds of situations. They prepare for these in various ways, including by participating in regional and national events that provide training in a competitive atmosphere. Their typically strong performance at these events demonstrates their proficiency to handle real-life situations. In 2012, a Syncrude team won the provincial mine rescue competition and will represent Alberta at the western Canadian championships in 2013.

Community Health Studies

The First Nations community of Fort McKay, which is adjacent to Syncrude’s Mildred Lake site, agreed in late 2011 to work with the Alberta government to identify the main health concerns of residents and the studies needed to assess the validity of those concerns. Community members have long had questions regarding the health effects of oil sands operations and the agreement should help provide definitive answers. The study began in 2012, with results expected in 2013.
Negotiations with the community of Fort Chipewyan for a similar agreement on health studies are continuing.

Syncrude takes seriously the health concerns of the surrounding communities, and supports enhanced scrutiny and transparency through the joint federal and provincial environmental monitoring program and the Wood Buffalo Environmental Association (WBEA).

**Recognition for Safety Performance**

Each year, Syncrude presents awards to encourage continuous improvement in safety performance throughout the organization and among contractor companies. These awards also enable the sharing of best practices and lessons learned. Three Syncrude suppliers – Aluma Systems, Acuren Group and Neegan – were recognized for having exemplary safety performance in 2012, while Klemke (KMC Mining) received the award for most improved performance.

In addition, Syncrude’s Base Plant Projects department and the Hydroprocessing Business Team received awards for excellent safety performance.

**Safety and Health**

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employee lost-time incident rate</strong></td>
<td>0.04</td>
<td>0.05</td>
<td>0.09</td>
<td>0.07</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Contractor lost-time incident rate</strong></td>
<td>0.10</td>
<td>0.03</td>
<td>0.04</td>
<td>0.09</td>
<td>0.05</td>
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<tr>
<td><strong>Combined employee and contractor lost-time incident rate</strong></td>
<td>0.07</td>
<td>0.04</td>
<td>0.06</td>
<td>0.08</td>
<td>0.04</td>
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<td><strong>Employee lost-time injuries (#)</strong></td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
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<tr>
<td><strong>Contractor lost-time injuries (#)</strong></td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>6</td>
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<tr>
<td><strong>Combined employee and contractor lost-time injuries (#)</strong></td>
<td>9</td>
<td>5</td>
<td>9</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td><strong>Employee total recordable incident rate</strong></td>
<td>0.49</td>
<td>0.35</td>
<td>0.36</td>
<td>0.83</td>
<td>0.66</td>
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<tr>
<td><strong>Contractor total recordable incident rate</strong></td>
<td>0.63</td>
<td>0.37</td>
<td>0.47</td>
<td>0.70</td>
<td>0.80</td>
</tr>
<tr>
<td><strong>Combined employee and contractor recordable incident rate</strong></td>
<td>0.59</td>
<td>0.36</td>
<td>0.43</td>
<td>0.75</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Employee recordable injuries (#)</strong></td>
<td>26</td>
<td>20</td>
<td>21</td>
<td>48</td>
<td>36</td>
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<tr>
<td><strong>Contractor recordable injuries (#)</strong></td>
<td>44</td>
<td>29</td>
<td>43</td>
<td>66</td>
<td>97</td>
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<tr>
<td><strong>Combined employee and contractor recordable injuries (#)</strong></td>
<td>70</td>
<td>49</td>
<td>64</td>
<td>114</td>
<td>133</td>
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<tr>
<td><strong>Syncrude injury severity rate</strong></td>
<td>0.20</td>
<td>4.20</td>
<td>6.54</td>
<td>7.55</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Contractor injury severity rate</strong></td>
<td>6.26</td>
<td>0.95</td>
<td>4.18</td>
<td>11.92</td>
<td>2.52</td>
</tr>
<tr>
<td><strong>Syncrude and contractor injury severity rate</strong></td>
<td>3.63</td>
<td>2.32</td>
<td>5.09</td>
<td>10.26</td>
<td>1.92</td>
</tr>
<tr>
<td><strong>Injury-free performance - maximum hours between LTIs (millions of hours)</strong></td>
<td>11.7</td>
<td>14.3</td>
<td>13.1</td>
<td>10.9</td>
<td>5.9</td>
</tr>
<tr>
<td>Employee health - temporary disability absenteeism (% of Syncrude workforce)</td>
<td>3.9</td>
<td>4.3</td>
<td>3.8</td>
<td>3.9</td>
<td>3.6</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Employee health - new long-term disability (LTD) cases (#)</td>
<td>21</td>
<td>14</td>
<td>22</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td>Employee health - health centre visits (#)</td>
<td>16,164</td>
<td>18,202</td>
<td>15,025</td>
<td>16,088</td>
<td>14,049</td>
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<tr>
<td>Employee fatalities (#)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Contractor fatalities (#)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>On-site responses by emergency services (#)</td>
<td>2,312</td>
<td>2,117</td>
<td>2,095</td>
<td>1,986</td>
<td>1,487</td>
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<tr>
<td>Off-site responses by emergency services (#)</td>
<td>123</td>
<td>104</td>
<td>72</td>
<td>68</td>
<td>82</td>
</tr>
<tr>
<td>EH&amp;S professionals on staff (#)</td>
<td>137</td>
<td>136</td>
<td>107</td>
<td>97</td>
<td>118</td>
</tr>
<tr>
<td>Workforce represented in formal joint management-worker H&amp;S committees (i.e. safe operating committees) (#)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>201</td>
<td>173</td>
</tr>
<tr>
<td>Health and safety convictions (#)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>On-site workforce (#)</td>
<td>11,766</td>
<td>13,518</td>
<td>14,963</td>
<td>15,178</td>
<td>16,830</td>
</tr>
</tbody>
</table>

1. Safe Operating Committees are a requirement of the Operations Integrity Management System currently being implemented throughout the organization; official tracking of participation began in 2011.

Safe Operating Committees are a requirement of the Operations Integrity Management System currently being implemented throughout the organization. Syncrude has always had safety committees; however, official tracking of participation began in 2011.

Syncrude adopted a new injury classification system in 2011. Under this, injury classifications include:

- **A lost-time incident** is an injury / illness that requires medical attention and results in the worker being absent from work; lost-time incident statistics include all lost time injuries / illnesses and fatalities.

- **Total recordable incident rate** includes all injuries / illnesses requiring medical attention, involving work restrictions, or that resulted in a worker being absent from work (recordable injury / illness statistics include all non-first aid injuries / illnesses); it is expressed as injuries / illness per 200,000 work hours.

- **Injury severity** is the average rate of lost workdays per lost-time injury / illness; only lost-time injuries / illness have days lost.
Finance and Operations

Performance Overview

- Shipments of 104.9 million barrels
- Operating expenditures of $42.24 per barrel
- $7.9 billion in capital projects underway to improve operations and environmental performance
- Mildred Lake Extension (MLX) Project announced; stakeholder consultation begins
- Ranked among top R&D spenders in Canada

Research and Development Expenditures
Major Projects Progress

There are four major projects* now underway at our sites:

- Construction of the two new mine trains at Mildred Lake is estimated at $4.2 billion, with start-up scheduled for late 2014. These trains will incorporate new wet crushing technology which will increase production capacity and bitumen recovery, and reduce maintenance requirements.

- Relocation and start-up of two mine trains at the Aurora North mine were complete ahead of schedule and under budget, as of the third quarter of 2013.

- Construction of a $1.9 billion centrifuge plant began in 2012. It will dewater fluid fine tails (FFT) and produce a clay-rich soil material that can be used in the reclamation of former mine areas. Start-up is scheduled for the first half of 2015.

- Construction of a $800 million composite tails (CT) plant at our Aurora North mine has been completed on-schedule and under budget. This plant will dewater and process FFT into reclamation-ready material.

* Status of projects as of Q4 2013.

Sulphur Management

Sulphur, a natural constituent of the oil sands resource, is removed in Syncrude’s bitumen upgrading process. It is by law considered a natural resource that must be managed according to provincial guidelines. Syncrude’s Joint Venture owners take their proportional share of all of Syncrude’s daily liquid sulphur production and market it independently. Sulphur is only stored in blocks during emergency or maintenance situations.

To reduce the liability associated with current sulphur inventories, Syncrude owners are exploring options to make the stockpile available to the market.

Future Development Plans

Syncrude is focused on improving capacity utilization for the next number of years. Our owners believe this approach is the best opportunity to add value in the near term.

In 2012, we announced our intention to develop the Mildred Lake Extension (MLX) Project to sustain bitumen production levels at our Mildred Lake operation upon depletion of the currently approved mining areas. Initial project scoping is underway and we anticipate filing a formal regulatory application in late 2014. Pending stakeholder, regulatory and final Joint Venture owner approvals, construction is expected to commence towards the end of this decade for start-up by 2023.

While previous preliminary plans had been to expand production capability by developing the Aurora South Mine leases, these will likely remain undeveloped until the early 2020s or later depending on progression of the MLX Project.

Near-term capital spending through 2014 will focus on mine train relocations and replacements at both the Mildred Lake and Aurora North sites, as well as construction of the tailings management facilities.

Expansion projects require unanimous approval by the Syncrude Joint Venture participants. The most recent information about Syncrude’s forward-looking plans is available from Canadian Oil Sands Limited.
## Financial and Operating Summary

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total crude oil production</strong>¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millions of barrels per year</td>
<td>105.8</td>
<td>102.2</td>
<td>107.0</td>
<td>105.2</td>
<td>104.9</td>
</tr>
<tr>
<td>Thousands of barrels per day</td>
<td>289</td>
<td>280</td>
<td>293</td>
<td>288</td>
<td>286</td>
</tr>
<tr>
<td>Millions of cubic metres per year</td>
<td>16.821</td>
<td>16.249</td>
<td>17.012</td>
<td>16.694</td>
<td>16.678</td>
</tr>
<tr>
<td><strong>Realized SCO selling price</strong> ($ per barrel)⁴</td>
<td>107.47</td>
<td>69.47</td>
<td>80.53</td>
<td>101.20</td>
<td>91.90</td>
</tr>
<tr>
<td><strong>Total operating costs</strong>²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millions of dollars</td>
<td>3,749.6</td>
<td>3,645.8</td>
<td>4,040.2</td>
<td>4,344.4</td>
<td>4,428.7</td>
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<tr>
<td>$ per barrel of production</td>
<td>35.44</td>
<td>35.69</td>
<td>37.74</td>
<td>41.28</td>
<td>42.24</td>
</tr>
<tr>
<td><strong>Capital expenditures</strong>³ (millions of dollars)</td>
<td>765.9</td>
<td>1198.1</td>
<td>1376.7</td>
<td>1477.4</td>
<td>2501.7</td>
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<tr>
<td><strong>Research and development expenditures</strong> (millions of dollars)</td>
<td>50.3</td>
<td>56.2</td>
<td>74.0</td>
<td>92.0</td>
<td>158.2</td>
</tr>
<tr>
<td><strong>Revenues</strong>⁴ (millions of dollars)</td>
<td>11,347</td>
<td>7,118</td>
<td>8,655</td>
<td>10,708</td>
<td>9,706</td>
</tr>
<tr>
<td><strong>Retained earnings</strong>⁵</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Bitumen produced</strong> (million barrels)</td>
<td>121.3</td>
<td>120.0</td>
<td>126.3</td>
<td>125.2</td>
<td>121.2</td>
</tr>
<tr>
<td><strong>Bitumen recovery</strong> (%)</td>
<td>90.3</td>
<td>90.8</td>
<td>90.7</td>
<td>91.7</td>
<td>91.6</td>
</tr>
<tr>
<td><strong>Upgrading yield</strong> (%)</td>
<td>85.9</td>
<td>86.9</td>
<td>85.8</td>
<td>85.7</td>
<td>86.3</td>
</tr>
<tr>
<td><strong>Environmental fines</strong> ($ millions)</td>
<td>0</td>
<td>0</td>
<td>3.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>**Environmental protection orders (#)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

¹ Production is Syncrude crude oil shipped

² Operating costs are costs related to the mining of oil sands, the extraction of bitumen into Syncrude crude oil, and maintenance of facilities; they also include administration costs, start-up costs, research, and purchased energy. There is no generally accepting accounting definition as to what constitutes "Operating Costs".

³ Capital expenditures includes development expense related to sustaining capital and growth capital projects. The accounting treatment of certain costs may vary significantly between different producers; some producers may elect to capitalize or defer and amortize certain expenditures that are recorded as an expense by other producers, and may segment "Corporate" costs.

⁴ Production of Syncrude Crude Oil becomes the property of Syncrude’s Joint Venture owners at point of departure from the Syncrude plant. As the operator, Syncrude does not collect revenue from the sale of crude oil or other products. Selling price and revenue reported here reflects only that of Canadian Oil Sands Limited, a 36.74% owner, grossed up for 100% Syncrude, and is solely meant to provide an indication of performance.

⁵ Syncrude’s annual operating and capital expenditures are funded pro-rata by Syncrude’s Joint Venture owners.

⁶ Syncrude paid a $5,000 administrative penalty to the Government of Alberta for failure to sufficiently report the release of emissions due to an isolated, on-site sour water leak in July 2010.

Note: These figures may differ from those reported by any of the Joint Venture participants due to differences in reporting conventions and methodology.
“When I took over Neegan Development from the Mikisew Cree First Nation in 1990, the company was going broke because we had too much heavy equipment that wasn't being used. Dennis Love, who was Syncrude's mine manager, sent over a couple of people to evaluate our fleet and finances before changing the scope of our tree-clearing contract. It allowed us to survive and reorganize. Our relationship has grown since then and we have more than 200 employees working in different areas at Syncrude.

It showed real foresight from Syncrude's leadership to see our community as potential suppliers because the conventional oil patch in Alberta was closed to Aboriginals at that time. We started the Northeastern Alberta Aboriginal Business Association to help others learn how to work with industry. Syncrude has supported the association by working with members on what they need to do to work at their sites. Both the industry and the communities have prospered because of this vision. That's win-win in my books.”

Economic Contribution

Performance Overview

- Economic contribution of $7.6 billion
- Purchased $5.5 billion in goods and services
- $2.1 billion spent in northern Alberta and with Aboriginal suppliers

Total Expenditures by Category

($ millions)

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalties, payroll &amp; municipal taxes</td>
<td>1,988</td>
<td>1,026</td>
<td>1,204</td>
<td>1,269</td>
<td>853</td>
</tr>
<tr>
<td>Purchased energy¹</td>
<td>878</td>
<td>432</td>
<td>458</td>
<td>528</td>
<td>339</td>
</tr>
<tr>
<td>Employees (net)</td>
<td>684</td>
<td>937</td>
<td>843</td>
<td>907</td>
<td>866</td>
</tr>
<tr>
<td>Materials and supplies</td>
<td>817</td>
<td>1,026</td>
<td>978</td>
<td>931</td>
<td>937</td>
</tr>
<tr>
<td>Contracted services</td>
<td>1,929</td>
<td>2,509</td>
<td>2,916</td>
<td>3,233</td>
<td>4,520</td>
</tr>
</tbody>
</table>
Other expenditures | 128 | 170 | 30 | 27 | 53
---|---|---|---|---|---
Total | 6,424 | 6,100 | 6,430 | 6,895 | 7,568

1. Also includes expenditures related to purchased bitumen

**Generating Economic Benefits**

Syncrude recognizes that its procurement strategy must benefit all Canadians. While Alberta will remain Syncrude's primary supply hub, supply chain studies indicate substantial indirect flow-through to other provinces via subcontracting. The Canadian Energy Research Institute conducts occasional studies on the economic impacts of oil sands development. Visit their website for more information.

**Annual Economic Contributions**

![Graph showing annual economic contributions from 2008 to 2012]

**Annual Procurement of Goods and Services**

---

Economic Contributions
Geographic Distribution of Expenditures ($ millions)

<table>
<thead>
<tr>
<th>Region</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal community</td>
<td>139</td>
</tr>
<tr>
<td>Municipality of Wood Buffalo</td>
<td>1,933</td>
</tr>
<tr>
<td>Edmonton area</td>
<td>1,717</td>
</tr>
<tr>
<td>Rest of Alberta</td>
<td>2,367</td>
</tr>
<tr>
<td>Rest of Canada</td>
<td>1,320</td>
</tr>
<tr>
<td>International</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>7,568</td>
</tr>
</tbody>
</table>

Geographic Distribution of Expenditures
Aboriginal Business Expenditures

Over $1.8 billion has been spent with Aboriginal companies since 1992.
Corporate Governance

Syncrude Canada Ltd. is a private company incorporated under the Business Corporations Act of Alberta.

Syncrude's bylaws stipulate that shares in the corporation may be held only by the shareholders in proportion to their interest in the Syncrude Project, a joint venture, and that Syncrude Canada Ltd. may not carry on business or activities other than to act as operator of the Syncrude Project on behalf of the shareholders.

Board of Directors

The Board of Directors of Syncrude is responsible for providing corporate oversight and direction. The Board of Directors takes seriously its duties and responsibilities, and it is the view of the Board that its approach in directing the business of Syncrude Canada Ltd. is comprehensive, effective and consistent with generally accepted standards of Canadian corporate governance. The whole Board meets at least annually and fulfills all statutory and other legal requirements that have not been delegated to the Committees of the Board. There are four Committees of the Board, which meet on a more frequent basis: CEO Committee; Human Resources & Compensation Committee; Pension Committee; and Safety, Health, Environment & Corporate Sustainability Committee. The Board and its Committees are composed of Directors appointed by the shareholders of the Corporation.

CEO Committee

The CEO Committee assists the Board in providing corporate direction and oversight for the Corporation's business and strategic plans and specific matters pertaining to its executive and senior management team, including:

- To review and endorse the long-term strategic plan of the Syncrude Project and the business plans of the Corporation;
- To review and approve the Corporation's succession plans for its executive and senior management team;
- To review and approve annual adjustments to the compensation of the Chief Executive Officer of the Corporation, as well as the other officers of the Corporation, as recommended by the Human Resources & Compensation Committee.

Human Resources & Compensation Committee

The Human Resources & Compensation Committee assists the Board in providing corporate direction and oversight for the Corporation's principal compensation and benefit programs and human resource policies and succession plans, including:

- To review and approve annual adjustments to the salaries and benefits of the Corporation's employees;
- To review and approve principal human resource policies and programs of the Corporation and significant changes thereto and to provide advice and direction on major human resource issues;
- To approve changes in any benefit plan texts, including the Retirement Plan for the
Employees of Syncrude Canada Ltd. and Member Corporations ("Retirement Plan"), that require Board approval;

- To approve any post-retirement pension payment adjustments and adhoc increases, and to authorize the Corporation, as sponsor of the Retirement Plan, to make such payments; and

- To review and approve changes to management structure and senior management succession plans of the Corporation or to provide guidance on significant issues regarding those matters.

**Pension Committee**

The Pension Committee assists the Board in providing corporate direction and oversight for the Corporation's responsibilities as administrator of the *Retirement Plan for Employees of Syncrude Canada Ltd. and Member Corporations* ("Retirement Plan") pursuant to the Employment Pension Plans Act ("Act"), including:

- To monitor the Retirement Plan assets and approve the appointment of the Actuary and the Trustee & Custodian of the Retirement Plan;

- To review and confirm or amend the Statement of Investment Policies and Procedures ("SIPP") each year on behalf of the Board;

- To review and recommend to the Board that the Board approve the annual audited financial statement of the Retirement Plan; and

- To review and approve financial assumptions and actuarial valuations of the Fund when required by the Act or when the Committee deems that additional Fund valuations are necessary.

**Safety, Health, Environment & Corporate Sustainability Committee**

The Safety, Health, Environment & Corporate Sustainability Committee assists the Board in fulfilling its corporate direction and oversight responsibilities for the Corporation's safety, health and environmental requirements, policies, practices, compliance systems and performance, and in monitoring current and future trends in safety, health and environmental laws and practices, including:

- To review and approve the Corporation's SH&E policy and significant revisions to that policy and the principal programs and processes supporting it;

- To review, assess and approve the Corporation's processes for the selection, preparation and disclosure of sustainability performance criteria and information and sustainability targets and measures as well as the programs and initiatives to address sustainability objectives and issues;

- To monitor and assess the Corporations performance in complying with its SH&E policy, procedures, standards and related requirements by receiving and reviewing regular or special reports from the Corporation outlining such performance;

- To confirm that the Corporation has implemented and continues to maintain and audit appropriate policies, procedures, controls and due diligence systems with respect to safety, health and environmental requirements and issues including, without limitation, compliance with all applicable laws, appropriate plans or responses to deal with emerging issues, or trends, and procedures for notifying the Board and Management Committee of the Syncrude Project of any significant or material incidents and, when necessary, to recommend to the Corporation revisions or amendments to such policies, procedures, controls and due
diligence systems; and
- To review reclamation and closure plans and receive updates on reclamation activities, including tailings management.

**Management Committee**

Each of the Participants of the Syncrude Project, a joint venture, appoints two representatives to the Management Committee, which meets regularly and provides oversight and governance for the project on behalf of the Participants. The weight assigned to each Participant's vote through the Management Committee is proportionate to its interest in the Syncrude Project.

The Management Committee reviews and approves the Syncrude Project's strategic plans, business plans, annual budget and major capital appropriations. In addition, it reviews overall performance, both operationally and financially.

The Management Committee is chaired by one of its members. The current Chair is Marcel Coutu, Chief Executive Officer of Canadian Oil Sands Limited.

The Management Committee has created subcommittees and delegated the indicated powers and duties to support Syncrude and the Participants. Each Participant, as well as Syncrude, is entitled to nominate two representatives to each of the subcommittees. Each subcommittee reports to the Management Committee, which appoints the chair and secretary of each subcommittee.

**Operations Subcommittee**

The Subcommittee assists the Management Committee of the Syncrude Project on operations matters, including:
- To monitor the performance of the Syncrude operations and provide advice and guidance to the Management Committee and Syncrude on plans designed to address improvement opportunities;
- To provide advice and guidance to the Management Committee and Syncrude on each Business Plan and Annual Budget for the Syncrude Project, including:
  - sustaining capital or significant changes to operating expenditures;
  - material regulatory matters, including those related to reclamation approvals and requirements;
  - procedures and controls for safety, health, environmental and security matters; and
  - the Pembina crude pipeline for the Syncrude Project.

**Growth & Development Subcommittee**

The Subcommittee assists the Management Committee of the Syncrude Project on capital growth and development opportunities, including:
- To identify and evaluate such opportunities and make recommendations concerning same;
- To provide advice and guidance to the Management Committee and Syncrude on each Business Plan and Annual Budget for the Syncrude Project with respect to growth and development opportunities and major capital projects in progress;
- To monitor the status and performance of all major capital projects in progress under its
mandate, including cost and schedule relative to applicable work programs and budgets; and

- To establish appropriate business controls for major capital project spending and performance.

**Audit & Business Controls Subcommittee**

The Subcommittee oversees all aspects of Syncrude's internal control systems and financial and related disclosures as required by law and good accounting practice, including:

- To review the adequacy of internal control systems and the scope and adequacy of the Corporation's internal audit program and the results of their activities;
- To review the scope, timing and findings of the external audit;
- To review and approve the selection and application of accounting principles and practices applied to the Syncrude Project;
- To review and recommend to the Board and/or Management Committee for approval all annual financial statements and/or related information;
- To review the quarterly and annual representations made by Syncrude to the Participants, as well as changes to the form of those representations; and
- To review and recommend new or additional Syncrude reporting disclosures as a result of changes in and/or emerging reporting, accounting or internal control issues affecting Syncrude Canada Ltd. financial statements or Participants' respective regulatory reporting requirements.

**Code of Ethics and Business Conduct**

Syncrude has a Code of Ethics and several other Business Conduct policies that are designed to foster a high level of ethical conduct expected by our many internal and external stakeholders. The Corporation stewards the application of these policies and reports regularly to the Audit and Business Controls Subcommittee and makes representations to the Board to confirm compliance. In addition to internal processes, Syncrude has an external system for the reporting of concerns about corporate conduct. Employees, contractors and members of the public may file their concerns anonymously and confidentially through EthicsPoint, at www.ethicspoint.com or 1-800-493-1866. This information is available internally and through Syncrude's external website at www.syncrude.com.
Corporate Information

Board of Directors

Canadian Oil Sands Partnership #1
Marcel Coutu\textsuperscript{1,2,3}
Trudy Curran\textsuperscript{2,5}
Darren Hardy\textsuperscript{4}
Ryan Kubik

Imperial Oil Resources
Dee Brandes\textsuperscript{3,4,5}
Glenn Scott\textsuperscript{1,2}
John Whelan

Mocal Energy Ltd.
Steve Fly\textsuperscript{3}
Kemmei Nakata
Kazuo Tanabe\textsuperscript{1}

Murphy Oil Company Ltd.
Dennis Ward\textsuperscript{5}
Cal Buchanan
Ron McIlwrick\textsuperscript{1,3,4}

Nexen Oil Sands Partnership
Kevin Reinhart\textsuperscript{1}
Jim Arnold\textsuperscript{3}
Bern Frasson\textsuperscript{2,4,5}

Sinopec Oil Sands Partnership
Weiquan Xiao
Pengfei Yin\textsuperscript{4,5}
Lianhua Zhang\textsuperscript{1,2,3}

Suncor Energy Oil and Gas Partnership
Richard Brown\textsuperscript{3}
Don Goodrow\textsuperscript{2,4}
Stephen Reynish\textsuperscript{1}
Pat Suzuki\textsuperscript{5}

Notes
1. CEO Committee
2. Human Resources & Compensation Committee
3. Management Committee
4. Safety, Health, Environment & Corporate Sustainability Committee
5. Pension Committee
Officers of Syncrude Canada Ltd.

Marcel Coutu
Chairman of the Board

Scott Sullivan
President and CEO

Harold Kunas
Chief Financial Officer and Vice President, Business Services

Ray Hansen
Vice President, General Counsel and Corporate Secretary

External Financial Auditors

Pricewaterhouse Coopers LLP
111-5th Avenue S.W., Suite 3100
Calgary, AB T2P 5L3
Canada

Further Information

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E-mail: info@syncrude.com
Website: www.syncrude.com
Investor Information

Advisory

In the interest of providing readers of this report with information regarding Syncrude, including management's assessment of Syncrude's future technologies, emissions and production levels and Syncrude operations, certain statements and graphs throughout this sustainability report contain "forward-looking information" under applicable securities law. Forward-looking statements in this report include, but are not limited to, statements and graphs with respect to: the expected amount of total major project costs, anticipated target in-service dates and estimated completion percentages for the Mildred Lake mine train replacements, the Aurora North mine train relocations, the composite tails plant at the Aurora North mine and the centrifuge plant at the Mildred Lake mine; the expected benefits of wet crushing technology; the anticipated scope and economics of the Mildred Lake mine extension ("MLX") project; the expectation that Syncrude will submit a regulatory application for the MLX project in 2014; the timing of construction and spending for the MLX project; all expectations regarding the development of the Aurora South mine leases; the expectations regarding 2014 capital spending; the expectations regarding the implementation of the Exxon Mobil Global Reliability System and Operations Integrity Management System; the expected emission reductions and costs relating to the Syncrude emissions reduction project; the expectations with respect to reducing emissions such as nitrogen oxide; the expected improvement in energy efficiency; the expected amount of energy use in 2013; the land reclamation plans and targets for Mildred Lake and the Aurora sites; Syncrude's tailings management plans, including without limitation, the anticipated timing of implementation of the various technologies and the benefits resulting from the technologies and the expectation that Syncrude's tailings management plan will meet the requirements of ERCB Directive 074 by 2015; and the expected water recovery from reverse osmosis.

The factors or assumptions on which the forward-looking information is based include, but are not limited to: the successful and timely implementation of capital projects; major project spending plans; the ability to obtain regulatory and Syncrude joint venture owner approval; the continuation of assumed tax, royalty and regulatory regimes and the success of the tailings management technologies.

You are cautioned not to place undue reliance on forward looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature, forward looking statements involve numerous assumptions, known and unknown risks and uncertainties, both general and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur. Although Syncrude believes that the expectations represented by such forward-looking statements are reasonable and reflect the current views of Syncrude, there can be no assurance that such expectations will prove to be correct.

Some of the risks and other factors that could cause results to differ materially from those expressed in the forward-looking statements contained in this sustainability report include, but are not limited to: the impact of technology on operations and processes and how new complex technology may not perform as expected; risks inherent to the operation of any large, complex refinery units, especially the integration between mining operations and an upgrader facility; changes in business strategy; imprecision of reserve and resource estimates; regulatory decisions; the effects of competition and pricing.
pressures; shifts in market demands; potential increases in costs; timing of completion of capital or maintenance projects; various events which could disrupt operations including severe weather conditions; technological changes; management retention and development; skilled labour shortages and the productivity achieved from labour in the Fort McMurray area; the supply and demand metrics for oil and natural gas; the unanimous joint venture owner approval for major expansions; the impact of Syncrude being unable to meet the conditions of its approval for its tailings management plan under ERCB Directive 074; the impacts of legislative or regulatory changes, especially as such relate to royalties, taxation, the environment and tailings and such other risks and uncertainties described from time to time in the reports and filings made with regulatory authorities by Syncrude.

You are cautioned that the foregoing list of important factors is not exhaustive. Furthermore, the forward-looking statements contained in this report are made as of the date of this report and unless required by law, Syncrude does not undertake any obligation to update publicly or to revise any of the included forward-looking statements, whether as a result of new information, future events or otherwise. The forward-looking statements contained in this report are expressly qualified by this cautionary statement.

Jantzi Social Index & Dow Jones Sustainability Index

Joint Venture owner Canadian Oil Sands Limited has been included on the Jantzi Social Index and Dow Jones Sustainability Index (DJSI), recognizing the performance of the Syncrude Project through a set of broadly based environmental, social and governance rating criteria. Jantzi Research is Canada's leading provider of social and environmental research for institutional investors. The DJSI recognizes companies for leadership in corporate responsibility.

Further information about Syncrude's business performance and investing in Syncrude can be obtained through the web sites listed here.

Canadian Oil Sands Limited
(COS – TSX)
www.cdnoilsands.com

Imperial Oil Resources
(IMO – TSX/AMEX)
www.imperialoil.com

Mocal Energy Limited
(5020 – TSE)
www.noex.co.jp

Murphy Oil Company Ltd.
(MUR – NYSE)
www.murphyoilcorp.com

Nexen Inc.
www.nexeninc.com

Sinopec Corp.
(386. HK – HKEX, 600028 – SSE, SNP – NYSE/LSE)
http://english.sinopec.com
Partners in Sustainability

**Syncrude has many partners in its sustainability journey.** Together, we are working to address and improve the economic, environmental and social performance of Canada's resource industry. In many cases, Syncrude is a leading contributor through the provision of staff expertise and funding. Readers are invited to learn more by visiting the websites listed below.

Aboriginal Human Resource Council  
www.aboriginalhr.ca

Alberta Chamber of Resources  
www.acr-alberta.com

Canada's Oil Sands Innovation Alliance  
www.cosia.ca

Canadian Association of Petroleum Producers  
www.capp.ca

Canadian Business for Social Responsibility  
www.cbsr.ca

Canadian Council for Aboriginal Business  
www.ccab.com

Canadian Oil Sands Network for Research and Development  
www.conrad.ab.ca

Mining Association of Canada  
www.mining.ca

Oil Sands Community Alliance  
www.oilsandsdevelopers.ca

**CAPP RESPONSIBLE CANADIAN ENERGY™**

Responsible Canadian Energy™ (RCE) is an industry performance program developed by the Canadian Association of Petroleum Producers (CAPP) with support and leadership from across the upstream oil and gas industry. The program is about performance and reflects industry’s ongoing commitment to responsible resource development and to continuous improvement in environment, safety and health, and social performance.

**Syncrude is a participant in the Towards Sustainable Mining (TSM) initiative of the Mining Association of Canada, which is a strategy for improving the sustainability performance of Canada's mining industry.**
Syncrude is a member of Canadian Business for Social Responsibility (CBSR), a business-led, non-profit Corporate Social Responsibility consultancy and peer-to-peer learning organization. CBSR provides its members with candid counsel and customized advisory services to improve their social, environmental and financial performance.

Syncrude is accredited at the Gold Level in the Progressive Aboriginal Relations (PAR) Program of the Canadian Council for Aboriginal Business. PAR measures corporate performance in Aboriginal employment, business development, capacity development and community relations.

Syncrude is a participant in the Integrated CO2 Network, or ICO2N, which is exploring the viability of large-scale carbon capture, transportation and storage for a cross-section of Canadian industry.

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