OIL SANDS
PERFORMANCE REPORT
2011
Cautionary Note

The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate entities. In this report "Shell", "Shell group" and "Royal Dutch Shell" are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words "we", "us" and "our" are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. "Subsidiaries", "Shell subsidiaries" and "Shell companies" as used in this report refer to companies in which Royal Dutch Shell either directly or indirectly has control, by having either a majority of the voting rights or the right to exercise a controlling influence. The companies in which Shell has significant influence but not control are referred to as "associated companies" or "associates" and companies in which Shell has joint control are referred to as "jointly controlled entities". In this report, associates and jointly controlled entities are also referred to as "equity-accounted investments". The term "Shell interest" is used for convenience to indicate the direct and/or indirect (for example, through our 23% shareholding in Woodside Petroleum Ltd.) ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.

This report contains forward-looking statements concerning the financial condition, results of operations and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "anticipate", "believe", "could", "estimate", "expect", "intend", "may", "plan", "objectives", "outlook", "probably", "project", "will", "seek", "target", "risks", "goals", "should" and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this report, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for the Shell’s products; (c) currency fluctuations; (d) drilling and production results; (e) reserve estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including potential litigation and regulatory measures as a result of climate changes; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. All forward-looking statements contained in this report are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional factors that may affect future results are contained in Royal Dutch Shell’s 20F for the year ended 31 December, 2011 (available at www.shell.com/investor and www.sec.gov). These factors also should be considered by the reader. Each forward-looking statement speaks only as of the date of this report, April 12, 2012. Neither Royal Dutch Shell nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this report.
CONTENTS

ABOUT THIS REPORT 3
JOHN ABBOTT, EXECUTIVE VICE PRESIDENT, HEAVY OIL – LETTER OF INTRODUCTION 4
SHELL’S OIL SANDS OPERATIONS 7
SAFETY AND EMERGENCY PREPAREDNESS 9
MANAGING CARBON DIOXIDE EMISSIONS 12
ADDRESSING WATER USE AT OUR OPERATIONS 15
MANAGING MINE TAILINGS 18
LAND USE AND RECLAMATION 22
PEOPLE, ENGAGEMENT AND COMMUNITIES 25
GLOSSARY OF TERMS 27
DATA 28
FEEDBACK FORM 31
APPENDIX 33
Workers on site at Muskeg River Mine.
ABOUT THIS REPORT

This report represents Shell’s third oil sands performance report and covers six key areas: safety and emergency preparedness; CO₂; water; tailings; land and reclamation; and people, communities and engagement.

This year, the report has been expanded to include performance data for safety and to report on Shell’s emergency response preparation.

It is important to note that this report only provides information on Shell’s operating performance in 2011.

Data presented for the Scotford Upgrader accounts for all of 2011, capturing both operations of the base plant and construction activities leading to commercial startup in June of the Expansion facilities.

Unless otherwise noted, all data presented for the Muskeg River Mine, Jackpine Mine and Scotford Upgrader is in reference to total Athabasca Oil Sands Project performance before division amongst the joint venture owners. The Athabasca Oil Sands Project is a joint venture between Shell (60%), Chevron Canada Limited (20%) and Marathon Oil Canada Corporation (20%). Data presented for in situ operations is 100% Shell share.

All monetary amounts referenced in the report are in Canadian dollars unless otherwise noted.

In Scope:
- Muskeg River and Jackpine Mines
- Scotford Upgrader (including third processing train operational since June 2011)
- In Situ: Peace River, Orion, Seal, Cliffdale, Chipmunk
Welcome to our 2011 Oil Sands Performance Report. This is the third consecutive year we have published a report to make transparent the environmental and social performance data associated with our Alberta oil sands operations. This year, in response to feedback from our stakeholders, we have expanded the content to include information on our safety performance and emergency preparedness.

As the leader of Shell’s oil sands operations, I regularly meet many stakeholders with broad and diverse opinions on these resources and how they should be developed. I welcome constructive debate and believe that a two-way conversation is important as we seek to continually improve our operations.

Fundamentally I believe that the oil sands are an important energy source that has a role to play in the global energy mix. Oil sands are a secure, reliable source of energy and an economic engine which drives employment, training and business development across Canada and beyond.

In my opinion, the long-term success of oil sands in the energy mix depends not only on our ability to compete economically but also to advance improvements in our environmental performance. There are impacts associated with the development of any energy source. As an operator I believe our job is to develop resources responsibly and to keep improving our ability to manage these impacts.

“OIL SANDS ARE A SECURE, RELIABLE SOURCE OF ENERGY.”

Shell celebrated 100 years of operations in Canada in 2011. We have been producing heavy oil from the Peace River region since 1979 and from the Athabasca region through the Athabasca Oil Sands Project – our joint venture with Chevron and Marathon Oil – since 2003. Despite being a relative newcomer to the oil sands industry, we are determined to take a leadership role when it comes to innovation and meeting environmental and social challenges responsibly.

Our vision is to be the leading company in environmental performance in Heavy Oil through actions that generate substantial improvements in CO₂, water and land management. To that end, we are advancing environmental strategies for greenhouse gas (GHG), water and land management that identify short, medium and long term actions to continue to improve our performance. To aggressively drive performance improvement it is important to have high aspirations.

We have therefore articulated long term, aspirational goals to guide our approach and our thinking – envisioning a world where new oil sands developments have a CO₂ intensity less than the intensity of the average barrel of crude oil consumed in North America; where zero river water is diverted for new mining and in situ operations and no incremental fresh water diversion is required for new upgrading facilities; and where we achieve a net neutral disturbance footprint by offsetting our active footprint through reclaiming or conserving land.

Today I have to say that we don’t know everything it will take to achieve these goals. However, when I look back on the history of the oil and gas industry I see a pattern of repeated innovation, of development and application of new technology, and of continuing to learn and improve.

Globally we have seen substantial technology developments over the years – accessing resources in ever deeper water, liquefying natural gas to allow it to be shipped to markets, finding new ways to improve our own energy efficiency and stewardship of resources. In aiming to achieve our oil sands environmental aspirations we will be leveraging Shell’s global research and development capabilities as well as working with others in the industry. I am therefore confident that we can find new ways to better develop oil sands resources and reduce the environmental impact of our operations.

Over the next decade, Shell sees opportunities to incrementally invest in our mining and upgrading operations to increase
production while at the same time bringing down our operating costs and lowering the environmental footprint. Our aim is to get more barrels out of the ground for incrementally reduced emissions, water and land impact.

In 2012 Shell and its joint venture owners plan to take Final Investment Decision on Quest, our carbon capture and storage (CCS) project that will see more than one million tonnes of CO₂ a year captured from our Scotford Upgrader and safely stored over 2 km underground.

We are also progressing plans for the Carmon Creek in situ project at Peace River – a new development of up to 80,000 barrels per day that will include a number of key environmental mitigation measures, including produced water recycling, co-generation and acid gas disposal. Indeed, the project is premised on not using water from the Peace River during normal operations (though some make up water will be required for startup activities) but rather only using brackish water from sub surface aquifers.

Shell has a track record of continuous improvement and applying technology and innovation to find solutions to energy challenges. We recognize that we must do a better job in reducing the environmental impacts of our oil sands operations if we are to compete in a world rightly asking more of the energy it uses.

We must also continue to report transparently on both our successes and shortcomings in managing these impacts.

I welcome feedback on this report and all aspects of our oil sands operations as we seek to develop these resources in a manner that continues to provide energy, prosperity and economic development, while reducing the impacts of our operations on the environment.

John Abbott
Executive Vice President, Heavy Oil

SHELL’S ENVIRONMENTAL STRATEGIES FOR HEAVY OIL

The following focus areas have been identified under GHG, water and land to work towards our long term aspirational goals in each of these environmental performance areas. Shell will continue to report back annually on our progress via this performance report.

**Greenhouse gases (GHG)**
- Improve energy efficiency in our operations
- Use lower carbon energy supplies
- Implement carbon capture and storage
- Purchase offsets, preferably related to our business

**Water**
- Optimize or use more groundwater at our mines to reduce Athabasca River use
- Optimize/integrate water use and wastewater treatment at our Scotford Upgrader
- Replace fresh water with brackish water in our in situ operations
- Implement new developments within existing river water allocations
- Develop technologies that reduce our reliance on river water

**Land**
- Increase temporary reclamation (land revegetated to control erosion that will be re-disturbed by future mining or construction activities) and use conservation offsets in the near term
- Integrate planning and execution of mining, waste disposal and reclamation
- Improve tailings management technology to achieve faster reclamation
- Increase stakeholder (particularly Aboriginal) participation in reclamation
- Develop reduced disturbance technologies for ore recovery

John Abbott
Executive Vice President, Heavy Oil
ENVIRONMENTAL COLLABORATION
AND EXTERNAL CERTIFICATION

Shell’s involvement with multi-stakeholder groups is an important part of our environmental management strategy. We are an active member of the Oil Sands Developers Group, Cumulative Environmental Management Association, Wood Buffalo Environmental Association and Regional Aquatics Monitoring Program. We are also an active member of the Canadian Association of Petroleum Producers (CAPP). CAPP’s mission is 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.

In 2011 Shell played a key role in forming Canada’s Oil Sands Innovation Alliance (COSIA – www.cosia.ca), a new industry coalition publicly announced in March 2012 to enable responsible and sustainable growth of Canada’s oil sands while delivering accelerated improvement in environmental performance through collaborative action and innovation. The alliance was created because the public’s expectation of environmental performance in the oil sands continues to evolve. We want to meet those expectations and we’ll work collaboratively to do so, building on previous successes. The creation of COSIA as an independent alliance builds on work done over the past several years by both the oil sands industry members and research and development organizations. COSIA will take these efforts to a much larger scale and will help the industry address environmental challenges by breaking down the barriers in the areas of funding, intellectual property enforcement and human resources that may otherwise impede progress on environmental performance.

COSIA’s collaborative approach will accelerate the discovery and development of environmental technologies and reduce the time from idea to implementation.

Since 2004 Shell has participated in the voluntary Towards Sustainable Mining (TSM -www.mining.ca) initiative developed by the Mining Association of Canada. Members must subscribe to a set of guiding principles and report on specific performance indicators annually. Shell achieved Level A (categorized as good performance) or better rankings in the most recent review published in fall of 2011. The review verified performance in the areas of crisis management planning, external outreach, energy use and GHG management and tailings management.

We are part of the Integrated CO₂ Network (ICO₂N), a coalition of Canadian companies committed to the deployment of Carbon Capture and Storage in Canada.

ISO 14011 (www.iso.org) is an international, externally verified standard for environmental management systems (EMS). Registration demonstrates that an organization has a sound environmental policy and an effective EMS to support that policy. The EMS system at Shell’s Peace River operations has been certified since 2001 and in 2004 the EMS at Shell’s oil sands mining operations was the first oil sands mining operation to be certified to the ISO 14001 standard. Although it does not set standards for actual environmental performance, ISO 14001 includes a commitment to continuous improvement in environmental performance, complying with environmental legislation and protecting the environment.

“COSIA’S COLLABORATIVE APPROACH WILL ACCELERATE THE DISCOVERY AND DEVELOPMENT OF ENVIRONMENTAL TECHNOLOGIES AND REDUCE THE TIME FROM IDEA TO IMPLEMENTATION.”
SHELL’S OIL SANDS OPERATIONS

Oil sands consist of bitumen – a heavy oil – water, sand, clay and other minerals. Open pit mines using large trucks and mechanical shovels extract the bitumen where it lies close enough to the surface. In areas where the bitumen lies too deep to be mined, we recover it in place, or in situ, using conventional drilling techniques. Shell uses two methods to extract bitumen in situ: thermal recovery and cold production. Thermal recovery involves injecting steam underground to heat the bitumen to allow it to flow before pumping it to the surface, leaving the sand and clay in place. Where the bitumen is more mobile, cold production techniques involve using long horizontal or vertical wells to pump the product to the surface without the need for heat.

Once the bitumen is extracted, it is either converted into synthetic crude at an upgrader or sold to refineries with upgrading capability to produce diesel fuel, gasoline and other consumer products.

Oil sands are deposited in three regions in Canada: the Athabasca, Peace River and Cold Lake deposits in Alberta. Shell is the only international oil company with production and interests in all three of Canada’s main oil sands deposits. The term oil sands, where used in this report, refers to Shell’s mining, upgrading and in situ operations.

ATHABASCA OIL SANDS PROJECT

The Athabasca Oil Sands Project is a joint venture between Shell (60%), Chevron Canada Limited (20%) and Marathon Oil Canada Corporation (20%). The Athabasca Oil Sands Project consists of Shell’s two adjacent open-pit mining operations: the Muskeg River Mine and the Jackpine Mine, located north of Fort McMurray, Alberta and the Scotford Upgrader, located near Fort Saskatchewan, Alberta, which upgrades bitumen into synthetic crude oil. Shell operates the mines and upgrader on behalf of the Athabasca Oil Sands Project joint venture.

The Muskeg River Mine’s current production capacity is 155,000 barrels per day and the Jackpine Mine’s capacity is 100,000 barrels per day. Completion of our Scotford Upgrader Expansion in June, 2011, brought our total upgrading capacity to 255,000 barrels per day. In 2011, the Expansion start up year, the Athabasca Oil Sands Project produced around 197,000 barrels per day (gross production). The design capacity for mining facilities is based on an assumed average percentage of bitumen in the oil sands ore. Actual production will depend on the ore grade as well as other operational parameters associated with any conventional oil or gas production facility.

IN SITU OPERATIONS

In 2011, we produced around 17,000 barrels per day (gross production) from our in situ operations, which extract bitumen too deep to be mined. The Peace River Complex produces bitumen using thermal and cold recovery methods. Shell’s other cold production facilities include the Seal Battery and Cliffdale Battery and production from the Chipmunk field. Shell’s Orion project, which came on-stream in 2007, is a project in the Cold Lake area which uses Steam Assisted Gravity Drainage (SAGD) to produce heavy oil.

In 2011 we divested our Woodenhouse in situ assets adjacent to our Grosmont venture. The decision to divest these leases aligns with Shell’s strategy to manage our portfolio so that we focus on growing our core assets.
**POTENTIAL FUTURE GROWTH**

**Debottlenecking** – In the near term, growth in our oil sands operations will come from a series of debottlenecking projects in oil sands mining, which could add up to 85,000 barrels per day over the next decade.

**Jackpine Mine and Pierre River Mine** – Regulatory approval is currently being sought for a 100,000 barrels per day expansion of our Jackpine Mine and a proposed 200,000 barrels per day Pierre River Mine development.

**Carmon Creek** – Regulatory approval is currently being sought for 80,000 barrels per day for the Carmon Creek In Situ project in Peace River.

"GROWTH IN OUR OIL SANDS OPERATIONS WILL COME FROM A SERIES OF DEBOTTLENECKING PROJECTS IN OIL SANDS MINING, WHICH COULD ADD UP TO 85,000 BARRELS PER DAY OVER THE NEXT DECADE."
SAFETY AND EMERGENCY PREPAREDNESS

At Shell, safety is a deeply held value and is our top priority. We do not accept that safety incidents are an inevitable consequence of working. Instead, we believe we can operate with zero fatalities, and no substantial incidents that put our facilities at risk or harm employees, contractors or neighbours. Shell manages safety across our oil sands operations through a combination of robust systems and ongoing support for a strong safety culture. To support the drive for what we call “Goal Zero”, we are working to ensure compliance with our safety procedures and building a culture that values safe behaviors. We also maintain robust emergency response plans and work closely with first responders, neighbours and other agencies to ensure processes are clear and understood.

OUR 2011 SAFETY PERFORMANCE

Shell uses two key measures of safety performance: total recordable case frequency (TRCF) and lost-time injury frequency (LTIF). TRCF shows the rate of recordable injuries that required medical attention per one million exposure hours worked by employees and contractors. Shell Heavy Oil Operations had 42 recordable injuries for a TRCF of 1.8, a decline over 2010 which saw 115 recordable injuries and a TRCF of 2.5.

Shell’s oil sands mines cut their recordable injury rate in half from 2010, and now have an injury frequency approaching 50 per cent of the major oil sands mining operators. The Expansion completed in 2011, reached 43 million exposure-hours without an LTI. Due to this accomplishment, Shell was recognized with the 2011 Responsible Canadian Energy Performance award in the category of Health and Safety Performance from CAPP (www.capp.ca/rce).

Shell and its key contractors, suppliers and leaders from the building trades unions took a new collaborative approach to improving safety results at Scotford.

In 2011, a team convened, bringing senior leaders from across Shell together with the Canadian Executive Board, Alberta Building Trades and of the United Association of Journeymen & Apprentices. The goal was to speak to our contractor and trades workforce with a united voice. Shell, the contractors and the union reinforced the importance of people working safely and going home safely each day. However, the purpose of the day was not primarily to reinforce a safety message, but rather to learn more about the deeper issues that can make a further difference to safety at Scotford, particularly among the contractor workforce.

While it is encouraging to see our rate of incidents fall, we need to continue our focus on safety by leadership engaging the frontline staff, continued training and coaching on hazard identification and control, and choosing safe contractors to work on our sites to help keep people safe.
Building a Strong Safety Culture

Shell’s strong safety culture wasn’t built overnight and requires ongoing effort to sustain, particularly as new staff and contractors join our oil sands business. To support the right culture, we are developing the safety leadership skills of our staff, by engaging frontline staff, focusing on hazard assessments, work permit detail, rewarding successful performance and addressing issues preventing work from being completed in a safe manner.

Making safety leadership visible is the most important activity we have adopted. Daily field visits by senior leaders and efforts to invest in the quality of our leadership have greatly improved the safe work culture. A well understood set of Health Safety & Environment values have empowered people at all levels of the organization to embrace safe work practices and intervene when necessary. On June 8, 2011, Shell hosted and organized Safety Day, an annual day set aside globally by Shell to bring all contractors and employees together to engage and focus on safety.

Training also plays a key role in raising awareness and creating the right culture. Over 5,500 Shell Heavy Oil employees and contractors have completed a Worksite Hazard Management training program which has helped prevent thousands of potential incidents by helping workers identify and control hazards. Shell in its management of process safety applies barrier thinking by encouraging people to identify potential risks at the lowest level possible in the process. A highly reliable culture is key to ensure that barriers are not just effective but sustainable. We regularly review our risk management plans to proactively ensure our barriers are appropriate.

Emergency Preparedness

While our primary concern is to prevent emergencies from occurring in the first place, Shell employees and contractors are highly trained to respond to incidents. Comprehensive emergency response plans exist for all of Shell’s oil sands operations and we conduct simulated incidents to test our ability to respond.

We provide opportunities on an ongoing basis to ensure neighbours understand these plans. For example, our Scotford Complex tests its external callout system on an annual basis to ensure people understand how to keep themselves safe. We also invest in emergency response and safety initiatives in local communities.

To celebrate the expansion of the Athabasca Oil Sands Project, owners Shell, Chevron and Marathon created a safety program for communities neighbouring our mines, upgrader and proposed Quest project. The program will provide $300,000 each year from 2011 to 2013 to support safety initiatives in the areas of motor vehicle safety; injury and fire prevention; workplace safety training for students; and emergency response.

“PROCESS SAFETY MEANS MAKING SURE OUR FACILITIES ARE WELL DESIGNED, SAFELY OPERATED AND PROPERLY MAINTAINED.”

“Scotford Upgrader Residue Hydrogen Conversion Unit.”
MEETING THE CHALLENGE

Shell continues to simplify its procedures, standards and reporting into one Health Safety and Environmental management system. The system focuses on critical elements such as permit to work, maintenance effectiveness and contractor safety management. This continues to substantially reduce the injury frequency rate in our oil sands operations.

Process safety means making sure our facilities are well designed, safely operated and properly maintained. We have process safety standards with Shell-wide rules in place and utilize a team of independent, senior internal auditors specialized in process safety to ensure these standards are implemented.

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<th>Safety Performance Data for Shell Heavy Oil Operations</th>
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<tbody>
<tr>
<td>Hours</td>
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<tr>
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<td>2011</td>
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Lost time injuries per million exposure hours worked (employees and contractors)
* rounded to the nearest 1,000 hour
“MINE TRUCKS ARE A SUBSTANTIAL SOURCE OF CO₂ EMISSIONS.”

MANAGING CARBON DIOXIDE EMISSIONS

Canada, with 0.5 per cent of the world’s population, produces 2 per cent of global GHG. While the oil sands are the fastest growing source of global GHG in Canada, they still account for only 6.5 per cent of Canadian and 0.1 per cent of global greenhouse gas emissions (source 2011 Natural Resources Canada – www.nrcan.gc.ca).

Measuring CO₂ emissions from oil production (wells) through to combustion (wheels) is known as a well-to-wheels analysis. According to Cambridge Energy Research Associates, on a wells-to-wheels basis, CO₂ emissions from oil sands are around 5-15 per cent higher than from the average barrel of crude oil consumed in the USA. Our analysis suggests that Shell’s oil sands mining and upgrading operations produce fuels at the lower end of this spectrum, as a result of emissions reduction measures already in place, such as cogeneration to produce steam and power.
Our total emissions increased from 5.0 million tonnes (Mt) CO₂e in 2010 to 6.7 (Mt) of CO₂ equivalent (CO₂e), reflecting a full year of operations at the new Jackpine Mine and the expansion of production at the Scotford Upgrader in 2011. This figure includes both direct and indirect emissions. Direct emissions come from sources under the direct control of the operating facility, such as on site transportation and from tailings pond and mine face emissions.

Mine trucks are a substantial source of CO₂ emissions at our mines. As the mine increases in size, longer truck distances are travelled, resulting in a corresponding increase in diesel consumption.

Intensity-based reporting of CO₂e emissions reflects emissions on a per barrel produced basis. Shell produced around 197,000 barrels per day (gross production) from its oil sands operations in 2011 compared with around 147,000 barrels per day in 2010. CO₂e emissions intensity decreased from 88.5 kilogram/barrel in 2010 to 86.2 kilograms/barrel in 2011. The higher intensity in 2010 can be attributed to the first major turnaround at our mining and upgrading facilities as well as the start up of Jackpine Mine. In 2011, the intensity remained high (although lower than the previous year) due to the start up of the upgrader expansion in June 2011, as well as the start up of the High Temperature Froth unit at Muskeg River Mine in January 2011.

The CO₂e emissions intensity data charted on the following page includes internal energy efficiency measures as well as the impact of externally purchased offsets. This presentation data is intended to demonstrate the effort we are making to offset the impact of emissions from our operations and does not suggest a physical reduction in overall emissions or emissions intensity.

In 2011, Shell’s regulated facilities met their intensity targets through energy efficiency projects, 215,000 t CO₂e of EPCs from cogeneration, and the retirement of 600,000 t CO₂e from Alberta based offsets.

“IN 2012, WE PLAN TO TAKE FINAL INVESTMENT DECISION ON QUEST, OUR CARBON CAPTURE AND STORAGE PROJECT THAT WILL SEE MORE THAN ONE MILLION TONNES OF CO₂ A YEAR CAPTURED FROM OUR SCOTFORD UPGRADER AND SAFELY STORED OVER 2 KM UNDERGROUND.”
**SHELL’S QUEST PROJECT**

The International Energy Agency believes carbon capture and storage (CCS) could account for approximately one-fifth of required reductions in emissions by 2050. Shell’s proposed Quest CCS project would capture and permanently store underground more than one million tonnes of CO2 per year from our Scotford Upgrader starting in 2015.

In June of 2011, Shell announced signed funding agreements with the Governments of Alberta and Canada to secure $865 million for the Quest project. CCS is currently not commercially viable, as carbon markets do not deliver sufficient incentives to support long-term private investment in the technology.

Government support for the project is therefore essential in order to ensure the large-scale CCS projects such as Quest are established. Signing the funding agreements represents an important milestone prior to Shell, Chevron and Marathon Oil taking a financial investment decision in 2012, subject to the outcome of the regulatory process and economic feasibility.

If the project proceeds, Quest would reduce the Scotford Upgrader’s direct CO2 emissions by up to 35% annually – equivalent to taking 175,000 cars off the road – and be a world first application of CCS for an oil sands development. Quest will take wells-to-wheels CO2 emissions from the Athabasca Oil Sands Project closer to parity with the average barrel of US crude consumed. Not only will the project substantially reduce the carbon footprint of our oil sands operations, it will also contribute to global knowledge to help advance other carbon capture storage projects.

In November 2011, Det Norske Veritas, an international risk management firm, awarded the proposed Quest project the world’s first certificate of fitness for safe underground CO2 storage. The company was commissioned by Shell to undertake a comprehensive independent review to assess the suitability of the project’s underground storage formation to safely and permanently store injected CO2.

**MEETING THE CHALLENGE**

As our bitumen production and upgrading capacity rises, we are taking several actions to manage the associated rise in CO2 emissions from our operations. We have developed a CO2 strategy with targets for the near, medium and long term future. In the near term for example, we have reduced the hot water intensity required to separate the bitumen from the oil sands mixture at Muskeg River Mine. Longer term, we are assessing options to use alternative fuels to power trucks and shovels in our mining operations. Shell is also pursuing CCS through our proposed Quest project, while purchasing carbon offsets as a near-term measure.

Shell Enhance™ froth treatment is the first commercial application of an innovative technology that will improve energy efficiency and reduce costs in oil sands production. The froth treatment technology uses higher temperatures to remove impurities from the oil sands froth more efficiently.

**Total (Direct & Indirect Emissions) Mt CO2e**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Direct emissions (Mt CO2e)</th>
<th>Total Indirect emissions (Mt CO2e)</th>
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<tr>
<td>2007</td>
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<tr>
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<td>3.7</td>
</tr>
<tr>
<td>2011</td>
<td>1.9</td>
<td>4.9</td>
</tr>
</tbody>
</table>

**Emissions Intensity (Direct & Indirect) and Mitigation kg CO2e /bbl**

- Total CO2e intensity (kg CO2e/bbl)
- Total CO2e intensity including offsets (kg CO2e/bbl)*

* Numbers might not seem to add to the total due to rounding

* The data is intended to show the efforts we are making to offset emissions from our operations and does not suggest a physical reduction in overall emissions or emissions intensity.
ADDRESSING WATER USE AT OUR OPERATIONS

Shell’s mining operations are located near the Athabasca River and upgrading operations near the North Saskatchewan River. Oil sands operations require water to separate bitumen from the sand. Shell uses two to three barrels of Athabasca River water in addition to recycled water to extract one barrel of bitumen from our mining operations. At the Scotford Upgrader, we draw water to cool hydrocarbon fractions (streams) and produce hydrogen. We used less than our permitted fresh-water allowance for the Peace, Athabasca and North Saskatchewan rivers in 2011.

ATHABASCA OIL SANDS PROJECT WATER USE

While Shell has permits to withdraw 0.6 per cent of the Athabasca River’s average annual flow, we used less than 0.12 per cent in 2011. About 78 per cent of water used in the bitumen extraction process was recycled from tailings ponds at our two mines. Our mines used about 2.0 barrels of freshwater for every barrel of bitumen produced. This compares with a freshwater intensity of 2.4 in 2010, which was largely as a result of the startup of Jackpine Mine. No water from our mining operation is returned to the Athabasca River.

In 2011, the Scotford Upgrader used 0.4 barrels of fresh water for every barrel of bitumen produced. A significant part of fresh water drawn from the North Saskatchewan River was consumed in the upgrading process, largely due to water evaporation in the upgrader’s cooling tower. Most of the waste water resulting from bitumen processing is treated and reused in operations, while the effluent resulting from steam production is tested and returned to the river. Shell also conducts groundwater monitoring to confirm no impacts to water quality and that it meets regulations.

IN SITU WATER USE

Average water intensity increased in 2011 from 1.6 to 2.2 barrels of freshwater for every barrel of bitumen produced. This increase is largely attributed to more water being required for steam injection in 2011. Also, production was cutback due to the third party operated export pipeline being shut-in for a period of time. Shell’s Orion project recycled more than 95 per cent of water in 2011, in addition to using non-potable sources to replace water lost to evaporation.

“SHELL’S ORION PROJECT RECYCLED MORE THAN 95 PER CENT OF WATER IN 2011.”

Water sampling at Jackpine Mine Pond.
“WE ARE CONTINUING TO EXPLORE OPPORTUNITIES TO USE MORE BRACKISH GROUNDWATER AT OUR OPERATIONS AND INCREASE WATER RECYCLING TO FURTHER REDUCE OUR NEED FOR RIVER WATER PARTICULARLY DURING LOW FLOW PERIODS.”
MEETING THE CHALLENGE

Current oil sands extraction methods are water-based and require responsible management of water use to minimize withdrawals from fresh water resources. As we increase production, Shell’s fresh-water withdrawals will also increase, challenging us to use water even more efficiently. We are continuing to explore opportunities to use more brackish groundwater at our operations and increase water recycling to further reduce our need for river water particularly during low flow periods. For example, at our Scotford Upgrader we treat water used for processing at our waste-water treatment plants and reuse it in the cooling towers.

For our in situ operations, the Carmon Creek Project in the Peace River region will use fresh water for start up of the facilities for steam generation, but once the project is up and running with stable operations, all the produced water will be reused and any make up water will come from brackish water sources and no fresh water is planned to be used for steam generation. We continue to research recovery schemes that would not require the injection of water.

Shell’s environmental studies determined that the Jackpine Mine development would have an impact on fish in the Khahago Creek. The creek ran through a part of the future mining area and external tailings facility. In late summer of 2011, Shell led a major fish rescue operation to capture 71,102 fish and transport them to natural fish habitat where they were released. This effort not only saved a large number of fish, it also greatly improved knowledge of the quantities, species, and habitat associations of fish found locally. We are in the process of creating a bypass channel for Khahago creek to avoid surface fresh water from being incorporated into the onsite surface water collection system.

Mine Water Use

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Annual Water Use (million m³)</th>
<th>Percentage freshwater (Athabasca River and other sources)</th>
<th>Percentage recycled pond water</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>81.8</td>
<td>78%</td>
<td>2%</td>
</tr>
<tr>
<td>2008</td>
<td>92.6</td>
<td>78%</td>
<td>22%</td>
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<tr>
<td>2009</td>
<td>94.7</td>
<td>76%</td>
<td>24%</td>
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<tr>
<td>2010</td>
<td>93.4</td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td>2011</td>
<td>130.8</td>
<td>72%</td>
<td>28%</td>
</tr>
</tbody>
</table>

Scotford Upgrader Water Use

<table>
<thead>
<tr>
<th>Year</th>
<th>Total water use (million m³)</th>
<th>Percentage total effluent treated and returned to the river</th>
<th>Percentage net fresh water consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4.2</td>
<td>55%</td>
<td>45%</td>
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<td>2008</td>
<td>6.3</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>2009</td>
<td>6.3</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>2010</td>
<td>5.5</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>2011</td>
<td>7.4</td>
<td>65%</td>
<td>35%</td>
</tr>
</tbody>
</table>

In Situ Water Use

<table>
<thead>
<tr>
<th>Year</th>
<th>Total freshwater consumption (million m³)</th>
<th>Fresh water intensity (bbl water consumed/bbl in situ bitumen)</th>
<th>Fresh water intensity (bbl water consumed/bbl MRM and JPM bitumen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1.5</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>2008</td>
<td>2.2</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2009</td>
<td>2.1</td>
<td>1.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2010</td>
<td>1.9</td>
<td>1.6</td>
<td>0.5</td>
</tr>
<tr>
<td>2011</td>
<td>2.2</td>
<td>2.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>
MANAGING MINE TAILINGS

Oil sands mining generates tailings, a mixture of water, sand, clay and residual hydrocarbons that remain after the bitumen is extracted. Tailings can be stored in an above ground tailings pond known as an external tailings facility or in mined-out pits. Placing tailings in ponds or mined pits marks the first stage of reclamation. Eventually, nearly all of the water will be removed and the remaining solid tailings will be blended and treated to produce material suitable for use in land reclamation. The coarse sand found in tailings is relatively easy to manage because it rapidly settles and can be used to fill in the mined area for reclamation and for construction purposes. The main challenge with tailings is the decades it can take for the clay and silt particles to settle to a more dense material. During the settling process, tailings facilities provide water for reuse in the bitumen extraction process which minimizes freshwater use.

The area covered by tailings facilities at Muskeg River Mine and Jackpine Mine reduced from 24 km² in 2010 to approximately 23 km² (about 13 km² at the Muskeg River Mine and 10 km² at Jackpine Mine), largely as a result of progressive reclamation work undertaken. The total volume of tailings discharged to our tailings facilities in 2011 was about 174 million m³. These volumes are substantially higher than the combined 102.9 million m³ reported in 2010 given a full year of operations at Jackpine Mine and higher production at Muskeg River Mine (whereas 2010 included a two month maintenance shutdown). Much of this volume is comprised of water which is largely reused in our operations.

HANDLING TAILINGS

Tailings water contains concentrated naturally occurring substances that can be hazardous to the health of people or wildlife if not managed. Managing them to protect wildlife as well as surface and groundwater is an important part of our operations. Residual oil floating on the surface of tailings ponds poses a threat to birds if they land on the pond to rest. Shell has implemented an advanced radar-based deterrent system, which includes the use of a multi array of sensory devices to deter birds away from the tailings facility. The combination use of these sensory type devices help prevent birds from landing. Recorded bird mortalities at Muskeg River Mine decreased from 15 in 2010 to 9 in 2011. Bird mortalities at Jackpine Mine decreased from 23 in 2010 to 17 in 2011. Bird mortalities were attributed to: collisions with mining equipment, site infrastructure (i.e. buildings) and with residual bitumen on the external tailings pond facilities.

Tailings are closely monitored to prevent impacts to water. Several methods are used to limit and manage the small amount of seepage that can occur from tailings facilities. Seepage collection systems capture and pump captured seepage back into the tailings ponds, while ground water monitoring wells ensure the system is functioning properly. Surface water monitoring around the mine sites is conducted as part of the Regional Aquatic Monitoring Program. In addition Alberta Environment conducts a water quality monitoring program within the watershed of the two mines. Shell monitors surface water at various locations throughout the Muskeg River watershed. Sampling results are closely monitored to ensure tailings from our facilities do not impact local aquatic resources.
“SHELL HAS IMPLEMENTED AN ADVANCED RADAR-BASED DETERRENT SYSTEM, WHICH INCLUDES THE USE OF A MULTI ARRAY OF SENSORY DEVICES TO DETER BIRDS AWAY FROM THE TAILINGS FACILITY.”
“SINCE 2005, SHELL HAS INVESTED NEARLY $200 MILLION IN TAILINGS RESEARCH, INCLUDING AN ADVANCED TEST FACILITY AT MUSKEG RIVER MINE TO SPEED UP THE DRYING OF TAILINGS FROM YEARS TO WEEKS.”

**IMPROVING TAILINGS TECHNOLOGY**

Since 2005, Shell has invested nearly $200 million in tailings research, including an advanced test facility at Muskeg River Mine to speed up the drying of tailings from years to weeks. Shell is deploying several methods to deal with tailings, including:

**Thickened Tailings** – this technique uses hydrocyclones, devices that apply centrifugal force to separate coarse and fine particles. Fine tailings are then “de-watered” by adding a chemical agent followed by gravity settling in a thickener. The Muskeg River Mine and Jackpine Mine are the only oil sands mines that use tailings thickeners to recover warm water from the tailings before they are deposited in storage facilities, as well as providing a concentrated stream of fine material. The collection and reuse of warm water reduces energy use and associated GHG emissions.

**Non-Segregated Tailings** – coarse sand is combined with de-watered fine tailings (clay and silt particles) from a thickener which fill the pores between the sand particles. A thickening agent is added to thicken the tailings and release water from the mixture. The mixture is kept in pits where more water is slowly released and reused while the remaining mixture forms a sandy deposit that settles and strengthens over time.

**Composite Tailings** – as with non-segregated tailings, sand is combined with clay to create a deposit. The major difference is that the fine tailings are not collected from a thickener but instead from the tailings pond. A composite tailings plant at Muskeg River Mine is expected to be fully constructed in 2012.

**Atmospheric Fines Drying** – a dredge collects fluid tailings, consisting of water, fine silts and clay particles, from the inner portion of the tailings facility and transports the tailings to a drying area where they are mixed with a binding agent (floculant) to help accelerate de-watering. The material is then placed on a shallow slope to actively move water off of the deposited material, as well as to increase drying through evaporation. Shell has established an atmospheric fines drying test facility at the Muskeg River Mine, which now occupies 0.85 km² of drying areas. In 2011, the facility delivered a final deposit of nearly 0.5 million tonnes of captured fines and clays, which reduces the amount of fines contained within the tailings facility.

---

**Total Liquid* Volume to Tailings Facilities (million m³)**

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muskeg River Mine (MRM)</td>
<td>102.5</td>
<td>112.4</td>
<td>118.9</td>
<td>82.2</td>
<td>106.1</td>
</tr>
<tr>
<td>Jackpine Mine (JPM)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20.7</td>
<td>68.28</td>
</tr>
</tbody>
</table>

* liquid discharged to the external tailings facility is the gross volume of water, coarse sand, silt and clay particles and small amounts of hydrocarbons. 78% of this water was recycled in 2011 for use in operations. Jackpine Mine started operations in 2010 so has no volumes to report prior to that year.
MEETING THE CHALLENGE

The Alberta industry regulator, the Energy Resources Conservation Board, issued a tailings directive – Directive 074 – in 2009 to reduce the amount of liquid tailings, thereby speeding reclamation. While the Directive is technically challenging, Shell supports its objectives. Shell has submitted required annual tailings plans for Jackpine Mine and Muskeg River Mine. Further information on Directive 074 and Shell’s plans to meet the regulation can be found at www.ercb.ca.

Shell was instrumental in establishing an Oil Sands Tailings Consortium of seven companies that agreed in late 2010 to share intellectual property and collaborate on tailings related research and development and technology. Building on the success of this consortium, we continue to promote increased sharing and collaboration within our industry on common environmental issues (see page 6).

In the latter half of 2011 we started mobilizing equipment and initiating activity to address the inflow of water into a mine pit cell that was being prepared to receive tailings in late 2010. Since that time, we have continued to safely contain the inflow and have been working to fully understand it and develop an appropriate technical solution. We have a technical plan in place to address the inflow and are engaging with regulators, other operators, Aboriginal neighbors and other stakeholders on the plan.
LAND USE AND RECLAMATION

Alberta’s oil sands lie under approximately 142,200 km² of land according to Alberta Environment1. About three per cent of that land could potentially be impacted by mining methods. The remaining reserves that underlie the surface area are too deep to access by mining and are only recoverable by in situ drilling methods which require much less surface land disturbance. In situ operations have a substantially smaller footprint than those of mining operations because bitumen separation is conducted underground. Mining involves moving large quantities of overburden (soil, rock and other materials) by truck and shovel before the bitumen can be extracted. Our mines move about one cubic metre of overburden to process 1.33 cubic metres of oil sands ore.

LAND USE IN OUR OPERATIONS
Land use for Jackpine Mine and Muskeg River Mine at the end of 2011 is detailed in the table on page 24. The Scotford Upgrader occupies an area of about 190 hectares. Our in situ operations had an active footprint of approximately 1,800 hectares in 2011. This total includes land used for production and test wells, pipelines, access roads and processing facilities.

THE MINE RECLAMATION PROCESS
Reclamation involves re-filling mined-out areas or re-contouring disturbed land prior to placing topsoil and planting suitable vegetation. The land used in our oil sands mining must be reclaimed – for example, through revegetation or reforestation – to a state that matches its pre-mined capability, as required by the Alberta government. The future landscape will not be identical to the previous land but will be designed to support local plants and animals. For example, in many cases the land will contain higher proportion of dryland ecosystems than existed previously (wetland ecosystems) to support larger trees than existed previously. Integrated closure and reclamation plans are developed and approved by the regulator prior to mine disturbance. The plans detail how disturbed lands will be reclaimed during operations and into the closure phase.

Oil sands operations have a long life-span, with many producing for around 40 years. Although reclamation work is underway, full reclamation is a staged process that takes several decades to complete. Reclamation of mining operations cannot begin until each mine cell is mined out, isolated and finally backfilled, while tailings ponds cannot be fully reclaimed until they are no longer required for operational use.

RECLAMATION UNDERTAKEN
Total reclamation at the Muskeg River Mine by the end of 2011 was 214 hectares, with 12 hectares of permanent reclamation and 202 hectares of temporary reclamation. Temporary reclamation areas are divided into two types:
1) areas that are undergoing reclamation activity (soil placement, but no trees or shrubs planted),
2) areas that have had soil placed and grasses established to reduce erosion or slope stability.

The second type will be re-disturbed by future mining or construction activities.

A portion of the west side of the external tailings facility and a portion of one of the overburden disposal areas at Muskeg River Mine were seeded in 2011. Shell also completed re-seeding of a landform along man-made Jackpine Lake, created to compensate for streams impacted by our operations.

We segregate and stockpile five different soil types at our mine sites (two upland surface soils, fine and coarsertextured subsoil and peat mineral mixture). The total volume of reclamation materials salvaged from Muskeg River Mine and Jackpine Mine in 2011 was about 6.91 million m³. Net stockpile volumes totalled 27.2 million m³. This material will eventually be used in final reclamation work.

1 Understanding the Oil Sands Land Fact Sheet, September, 2011
CONSULTING OTHERS
We continue to seek to work with Aboriginal neighbours to incorporate their thinking and traditional knowledge into our management of land and reclamation efforts. Aboriginal elders and users of the land teach us about the traditional roles of land, vegetation and wildlife in their culture to help ensure that once mining ends, the land will meet local needs. In 2011 Shell brought together Aboriginal representatives and other community members to participate in a reclamation workshop. The two-day event allowed people to speak directly with Shell employees and consultants involved in reclamation work and to see first-hand the work undertaken to date. Shell also spent time listening to ensure stakeholder views were understood and could be incorporated into our reclamation planning.

Shell continues to work with the Northern Alberta Institute of Technology (NAIT) Boreal Research Institute, located in Edmonton, Alberta, and other organizations to identify best practices for restoration work and to gain expertise from academia, government and industry.

“SHELL’S RECLAMATION GOAL IS TO ACHIEVE MAINTENANCE-FREE, SELF-SUSTAINING ECOSYSTEMS. WE ARE COMMITTED TO STARTING PROGRESSIVE RECLAMATION OF OUR MINED AREAS WITHIN 20 YEARS FROM THE DAY OF FIRST LAND DISTURBANCE.”
MEETING THE CHALLENGE

Shell’s reclamation goal is to achieve maintenance-free, self-sustaining ecosystems. We are committed to starting progressive reclamation of our mined areas within 20 years from the day of first land disturbance.

Over the next decade, we plan to increase permanent reclamation and develop technologies and mine development plans to minimize our land disturbance. We continue to collaborate with research institutions and other operators to share our findings and accelerate the pace of land reclamation.

Shell is helping to conserve land in Canada’s northern boreal zone. In early 2012, we announced the purchase of a nearly 740 hectares parcel of land known in northern Alberta. The property, known as the Shell True North Forest, is located about 70 km north of Grand Prairie, Alberta and less than one km south of Moonshine Provincial Park. The land was secured through an arrangement with the Alberta Conservation Association. Together, both parties will manage the Shell True North Forest for biodiversity conservation and low impact recreational use.

<table>
<thead>
<tr>
<th>2011 LAND STATUS</th>
<th>Jackpine Mine</th>
<th>Muskeg River Mine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity (all units hectares)</td>
<td>Jackpine Mine</td>
<td>Muskeg River Mine</td>
</tr>
<tr>
<td>EPEA approved footprint</td>
<td>7,669</td>
<td>12,572</td>
</tr>
<tr>
<td>Total Active Footprint</td>
<td>3106.7</td>
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</tr>
<tr>
<td>Cleared</td>
<td>889.8</td>
<td>814.1</td>
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<tr>
<td>Disturbed</td>
<td>3405.3</td>
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<tr>
<td>Permanent Reclamation</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Temporary Reclamation</td>
<td>5.6</td>
<td>202</td>
</tr>
<tr>
<td>Certified Reclamation</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Given the 40 year or so life cycle of the average oil sands operation, we have a long-term interest in the development and well-being of the communities in which we operate. The impacts of our operations can be positive or negative, but how well we manage them affects the wellbeing of our neighbours and ultimately of our business.

Shell uses the term social performance to describe how we manage the impacts of our business on the communities and broader society in which we operate. The discipline ties together the company’s social impact management, social investment, stakeholder engagement and Aboriginal capacity building activities.

The Scotford Upgrader expansion project in 2011 delivered substantial economic benefit and provided opportunity to a large number of apprentices (equivalent to more than 30 per cent of workers on the project). However, one consequence of a large scale development like this is road congestion. Over nearly 5 years more than 45,000 different people worked on the project at Scotford, so a carefully coordinated plan to manage the traffic particularly during shift change was required. Shell re-configured the work day and breaks so workers could leave the site 30 minutes before the much larger expansion construction crew. By leaving the site early most people cut their commuting time by an hour.

STAKEHOLDER ENGAGEMENT
We seek opportunities to gain advice and input from people neighbouring our operations and those who take an active interest in Shell’s oil sands business. In spring of 2011, Shell hosted the Energy Café, a forum to discuss the oil sands and broader energy issues that aired nationally on Canada’s Global Television. Later that fall, Shell convened a roundtable comprised of representatives from academia, non-governmental organizations and think tanks in Canada and the US to discuss issues related to oil sands development with a focus on GHG emissions and climate change. Shell held open houses in four communities along the proposed pipeline route and CO2 injection site for our Quest CCS project in 2011. That fall, open houses were also held in the communities of Peace River, Fort Chipewyan and Fort McMurray.

Shell also frequently hosts tours of our oil sands operations to help stakeholders understand our business and how we’re addressing environmental and social impacts.

SOCIAL INVESTMENT
Shell contributes to the communities in which we operate through company-wide programs such as the Shell Community Service Fund and our FuellingChange™ environmental program. Shell and its employees are strong supporters of the United Way in Fort McMurray, raising funds for programs that address community priorities. Approximately $3.4 million was invested in environmental and social programs supporting communities neighbouring our oil sands operations in 2011. Of this, Shell and its joint venture owners contributed $1 million to fund the Father Patrick Mercredi High School’s Science & Technology Centre in Fort McMurray. In early 2011, Shell and its joint owners, also announced a $1.2 million commitment over three years through the Northern Lights Health Region to support research into mental health issues and improve the health of homeless people in Fort McMurray.

Full details on Shell’s social investment program are available at www.shell.ca/community.

“APPROXIMATELY $3.4 MILLION WAS INVESTED IN ENVIRONMENTAL AND SOCIAL PROGRAMS SUPPORTING COMMUNITIES NEIGHBOURING OUR OIL SANDS OPERATIONS IN 2011.”
SUPPORTING ABORIGINAL COMMUNITIES

Many of Shell’s operations are located on or near the traditional lands of Aboriginal peoples. Oil sands development can have an impact on traditional land use and culture. We work closely with local communities to build and maintain mutually beneficial relationships. We provide substantial funds to Aboriginal organizations to take part in consultation activities with Shell and for a range of other activities. These include conducting traditional knowledge and land use studies; consulting with Elders and other community members; and hiring consultants to conduct technical reviews of Shell’s environmental impact assessments and other technical studies. In total, Aboriginal employees comprised 4% of our employee workforce in 2011, which is approximately 150 people.

Strong relationships exist with Aboriginal businesses based near our oil sands developments. In 2011, Shell spent about $92.5 million with companies in the Regional Municipality of Wood Buffalo, and nearly $159 million on business with Aboriginal suppliers, many from the nearby Aboriginal community of Fort McKay. In June 2011, Shell Canada announced it had reached a milestone of $1-billion in contracts with Aboriginal companies over the previous six years, much of that related to oil sands mining. Shell actively seeks to increase the number of Aboriginal people in our workforce through internships and other programs. In 2011 Shell introduced an archaeological assistants training program. The program provides a unique opportunity to local First Nations people to gain experience in archaeological field survey techniques.

In 2011 Shell announced a fly-in/fly-out program for Fort Chipewyan, making it possible for employees to continue living in their community while working at Shell. Through the National Aboriginal Achievement Foundation, Shell provides scholarships for Aboriginal students from communities near its operations and provides financial assistance to Aboriginal students in Alberta who are pursuing oil and gas trades and technology careers. Since 2004, Shell’s funding of the Fort McKay E-Learning Centre has enabled 14 young people to complete high school and dozens more to access classes while remaining in Fort McKay as opposed to commuting 130 km round trip to Fort McMurray each day. Shell also contributed funding in 2011 to support creation of a Woodland Cree video to increase Aboriginal cultural awareness in the Peace River region.

MEETING THE CHALLENGE

The regional municipality of Wood Buffalo as well as Alberta’s industrial heartland have experienced substantial changes since the mid-1990s due to growth by oil sands mining and upgrading. Growth has impacted the ability of local and regional service providers to meet the needs of a fast growing population. Shell works individually and through a number of multi-stakeholder groups to mitigate the impacts of oil sands development while enhancing opportunities for local people. We seek to train and hire locally, in addition to using businesses and services in the areas around our operations. For example, Shell financially supports Careers: The Next Generation, a private-public partnership to develop the next generation of skilled workers. Since 2007 we have provided internships for approximately 90 students at our oil sands operations.

A substantial number of commitments have been made to local people and stakeholders related to our oil sands operations. These focus on areas such as: community infrastructure, training, cultural retention and community wellness. Ensuring we deliver on our commitments is of great importance to Shell. We regularly review progress on commitment delivery with stakeholders.

We work closely with local communities to build and maintain mutually beneficial relationships.
GLOSSARY OF TERMS

ATHABASCA OIL SANDS PROJECT, a joint venture among Shell Canada Limited (60%), Chevron Canada Limited (20%) and Marathon Oil Canada Corporation (20%). The AOSP consists of the Muskeg River and Jackpine Mines located north of Fort McMurray, Alberta and the Scotford Upgrader, located near Edmonton, Alberta.

BITUMEN A thick hydrocarbon, referred to as heavy oil.

CLIMATE CHANGE AND EMISSIONS MANAGEMENT FUND The fund set up under the Climate Change and Emissions Management Act that is used to support research, development and deployment of transformative change technologies to reduce greenhouse gas emissions in Alberta. (Source: Specified Gas Emitters Regulation)

CO₂ emits – Carbon dioxide equivalent. The 100-year time horizon global warming potential of a specified gas expressed in terms of equivalency to CO₂. (Source: Specified Gas Emitters Regulation)

COGENERATION Combined production of heat for use in industrial facilities and the production of electricity as a by-product. (Source: Specified Gas Emitters Regulation)

COLD PRODUCTION An in situ production technique used when the bitumen is less viscous and does not require heating to make it fluid enough to be pumped to the surface.

DIRECT EMISSIONS The release of specified gases from sources under the direct control of the operating facility expressed in tonnes CO₂e.

EFFLUENT Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial facility. (Source: Environment Canada)

EMISSIONS INTENSITY The quantity of specified gases released by a facility per unit of production from that facility.

EMISSION OFFSET A reduction in one or more specified gases (regulated greenhouse gas emissions) occurring at sites not covered by the Specified Gas Emitters Regulation. (Source: Specified Gas Emitters Regulation)

EMISSION PERFORMANCE CREDIT (EPCS) Generated when a facility reduces its Net Emissions Intensity below its Net Emissions Intensity Limit. EPCS are awarded on a tonne CO₂e reduction basis. (Source: Specified Gas Emitters Regulation)

GREENHOUSE GAS (GHG) Mainly, carbon dioxide (CO₂), methane (CH4), and nitrous oxide (N₂O), all of which contribute to the warming of the Earth’s atmosphere. (Source: Government of Alberta, Department of Energy)

HA – HECTARE. A unit of surface area equal to a square that is 100 metres on each side.

HEAVY OIL – Refers to Shell’s upgrading, mineable and in situ oil sands business.

INDIRECT EMISSIONS – Emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.

IN SITU Refers to various methods used to recover deeply buried bitumen deposits, including steam injection, solvent injection, electrical heating and cold production.

Km² – Square kilometre. A unit of surface area equal to a square that is one kilometre on each side.

LOST-TIME INJURY FREQUENCY Refers to the rate of recordable injuries requiring time off work per one million exposure hours worked.

m³ – Cubic metre. A unit of volume or capacity equal to 1000 litres.

MT – Megatonne. A unit of mass equal to one million tonnes.

RECLAMATION Returning disturbed land to a land capability equivalent to what it was prior to mining. Reclaimed property is returned to the province of Alberta at the end of operations.

CERTIFIED RECLAMATION Reclaimed areas for which a certificate has been issued under the terms of the Alberta Environmental Protection and Enhancement Act (EP&E), signifying that the terms and conditions of the EPA approval have been complied with and the lease is returned to the Crown.

PERMANENT RECLAMATION Landform construction and contouring, placement of capping and reclamation materials and revegetation for terrestrial or wetlands areas. Land cannot be listed under the permanent reclamation category until revegetation has occurred that is reflective of the approved Reclamation Plans.

TEMPORARY RECLAMATION Includes gHg emissions from direct and indirect sources.

TOTAL GHG EMISSIONS Includes GHG emissions from direct and indirect sources.

TOTAL RECORDABLE CASE FREQUENCY Refers to the rate of recordable injuries that required medical attention per one million exposure hours worked.

SPECIFIED GAS EMITTERS REGULATION Regulates six GHG species – carbon dioxide (CO₂), methane (CH4), nitrous oxide (N₂O), PFCs, HFCs, and sulphur hexafluoride (SF₆) – for facilities emitting over 100,000 tonnes of CO₂ per annum in Alberta.

STEAM ASSISTED GRAVITY DRAINAGE (SAGD) A method of producing heavy oil which involves two horizontal wells; one above the other; steam is injected into the upper well and softened bitumen is recovered from the lower well.

SYNTHETIC CRUDE OIL A mixture of hydrocarbons, similar to crude oil, derived by upgrading bitumen from oil sands.

TAILINGS The residual by-product that remains after the bitumen is separated from the mined oil sands ore; tailings are composed of residual bitumen, water, sand, silt and clay particles.

THERMAL PRODUCTION A bitumen recovery technique that includes injecting high-pressure steam underground to mobilize the bitumen, which is then pumped to the surface leaving the sand in place.

TOTAL GASS EMISSIONS Includes GHG emissions from direct and indirect sources.
DATA

SAFETY (rounded to the nearest 1,000 hour)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tbody>
<tr>
<td>Hours</td>
<td>21,063,000</td>
<td>30,227,000</td>
<td>46,611,000</td>
<td>45,713,000</td>
<td>23,540,000</td>
</tr>
<tr>
<td>Total Recordable Cases</td>
<td>91</td>
<td>113</td>
<td>119</td>
<td>115</td>
<td>42</td>
</tr>
<tr>
<td>Total Recordable Case Frequency</td>
<td>4.3</td>
<td>3.7</td>
<td>2.6</td>
<td>2.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Lost Time Injuries</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Lost Time Injury Frequency</td>
<td>0.3</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

CO₂

Oil Sands Operations (Muskeg River Mine, Jackpine Mine, Scotford Upgrader and In Situ)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
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<th>2010</th>
<th>2011</th>
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</thead>
<tbody>
<tr>
<td>Total direct emissions (Mt CO₂e)</td>
<td>2.3</td>
<td>3.2</td>
<td>3.2</td>
<td>3.7</td>
<td>4.9</td>
</tr>
<tr>
<td>Total indirect emissions (Mt CO₂e)</td>
<td>1.5</td>
<td>1.6</td>
<td>1.5</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total emissions (Mt CO₂e)</td>
<td>3.8</td>
<td>4.8</td>
<td>4.7</td>
<td>5.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Total CO₂e intensity (kg CO₂e/bbl)</td>
<td>69.0</td>
<td>84.0</td>
<td>82.8</td>
<td>88.5</td>
<td>86.2</td>
</tr>
<tr>
<td>Total CO₂e intensity including offsets (kg CO₂e/bbl)*</td>
<td>69.0</td>
<td>82.1</td>
<td>74.5</td>
<td>45.2</td>
<td>55.7</td>
</tr>
<tr>
<td>Total direct emissions (Mt CO₂e) – In Situ</td>
<td>0.34</td>
<td>1.12</td>
<td>1.02</td>
<td>0.89</td>
<td>0.58</td>
</tr>
<tr>
<td>Total indirect emissions (Mt CO₂e) – In Situ</td>
<td>0.09</td>
<td>0.16</td>
<td>0.13</td>
<td>0.14</td>
<td>0.15</td>
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<tr>
<td>Total direct emissions (Mt CO₂e) – Scotford Upgrader</td>
<td>1.87</td>
<td>1.82</td>
<td>1.86</td>
<td>1.82</td>
<td>2.85</td>
</tr>
<tr>
<td>Total indirect emissions (Mt CO₂e) – Scotford Upgrader</td>
<td>0.07</td>
<td>0.13</td>
<td>0.05</td>
<td>0.03</td>
<td>0.41</td>
</tr>
<tr>
<td>Total direct emissions (Mt CO₂e) – Jackpine and Muskeg River Mines</td>
<td>0.47</td>
<td>0.57</td>
<td>0.75</td>
<td>1.01</td>
<td>1.44</td>
</tr>
<tr>
<td>Total indirect emissions (Mt CO₂e) – Jackpine and Muskeg River Mines</td>
<td>1.03</td>
<td>1.03</td>
<td>1.01</td>
<td>1.11</td>
<td>1.32</td>
</tr>
</tbody>
</table>

* The data is intended to show the efforts we are making to offset the impact of emissions from our operations and does not suggest a physical reduction in overall emissions or emissions intensity.
## Water

### Scotford Upgrader

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total water use (million m³)</td>
<td>6.2</td>
<td>6.0</td>
<td>6.3</td>
<td>5.5</td>
<td>7.4</td>
</tr>
<tr>
<td>Net fresh water consumption (million m³)</td>
<td>3.7</td>
<td>3.3</td>
<td>3.7</td>
<td>3.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Total effluent treated and returned to the river (million m³)</td>
<td>2.5</td>
<td>2.7</td>
<td>2.6</td>
<td>2.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Percentage net fresh water consumption</td>
<td>60%</td>
<td>55%</td>
<td>58%</td>
<td>57%</td>
<td>65%</td>
</tr>
<tr>
<td>Percentage total effluent treated and returned to the river</td>
<td>40%</td>
<td>45%</td>
<td>42%</td>
<td>43%</td>
<td>35%</td>
</tr>
<tr>
<td>Fresh water intensity (bbl water consumed/bbl MRM and JPM bitumen)</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
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### Muskeg River Mine and Jackpine Mine**

<table>
<thead>
<tr>
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<th>2008</th>
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<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total water use – Freshwater from the Athabasca, freshwater from other sources and recycled pond water (million m³)</td>
<td>81.8</td>
<td>92.6</td>
<td>94.7</td>
<td>93.4</td>
<td>130.8</td>
</tr>
<tr>
<td>Mine recycle water use (million m³)</td>
<td>72.1</td>
<td>73.3</td>
<td>74.2</td>
<td>69.6</td>
<td>101.9</td>
</tr>
<tr>
<td>Net Athabasca River freshwater consumption (million m³)</td>
<td>5.7</td>
<td>13.5</td>
<td>15.2</td>
<td>17.5</td>
<td>23.0</td>
</tr>
<tr>
<td>Net freshwater from other sources consumption – surface runoff and basal (million m³)</td>
<td>4.0</td>
<td>5.8</td>
<td>5.3</td>
<td>6.3</td>
<td>5.8</td>
</tr>
<tr>
<td>Percentage recycled pond water</td>
<td>88%</td>
<td>79%</td>
<td>78%</td>
<td>74%</td>
<td>78%</td>
</tr>
<tr>
<td>Percentage freshwater (Athabasca River)</td>
<td>7%</td>
<td>15%</td>
<td>16%</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td>Percentage freshwater from other sources (surface runoff and basal)</td>
<td>5%</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>Freshwater Intensity – Athabasca River (bbl freshwater/bbl bitumen)</td>
<td>0.7</td>
<td>1.8</td>
<td>2.0</td>
<td>2.4</td>
<td>2.0</td>
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### In Situ

<table>
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<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total freshwater consumption (million m³)</td>
<td>1.5</td>
<td>2.2</td>
<td>2.1</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Fresh water intensity (bbl water consumed/bbl in situ bitumen)</td>
<td>2.8</td>
<td>1.3</td>
<td>1.5</td>
<td>1.6</td>
<td>2.2</td>
</tr>
</tbody>
</table>

** Better accounting of water use at our mine sites in 2010 has seen the inclusion of freshwater from other sources.
### TAILINGS

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
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<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Muskeg River Mine</strong></td>
<td>102.5</td>
<td>112.4</td>
<td>118.9</td>
<td>82.2</td>
<td>106.1</td>
</tr>
<tr>
<td><strong>Jackpine Mine</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20.7</td>
<td>68.28</td>
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### LAND AND RECLAMATION

<table>
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<tr>
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<th>2011</th>
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<tbody>
<tr>
<td><strong>Muskeg River Mine</strong></td>
<td>4,929</td>
<td>5,578</td>
<td>5,738</td>
<td>5,393</td>
<td>5,696.4</td>
</tr>
<tr>
<td>Total active footprint – mine + plant size (ha)</td>
<td>4,929</td>
<td>5,578</td>
<td>5,738</td>
<td>5,393</td>
<td>5,696.4</td>
</tr>
<tr>
<td>Permanent reclamation (ha)</td>
<td>17</td>
<td>21</td>
<td>16</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Temporary reclamation (ha)</td>
<td>11</td>
<td>111</td>
<td>111</td>
<td>111</td>
<td>202</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Jackpine Mine</strong>*</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total active footprint – mine + plant size (ha)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,708</td>
<td>3,106.7</td>
</tr>
<tr>
<td>Permanent reclamation (ha)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Temporary reclamation (ha)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>5.6</td>
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### COMMUNITY

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<th>2009</th>
<th>2010</th>
<th>2011</th>
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</thead>
<tbody>
<tr>
<td>Social investment spend (millions)</td>
<td>1.8</td>
<td>1.5</td>
<td>2.7</td>
<td>2.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Aboriginal spend (millions)</td>
<td>207</td>
<td>212</td>
<td>222</td>
<td>185</td>
<td>159</td>
</tr>
</tbody>
</table>

*** No historical information exists for Jackpine Mine as 2010 is first reporting year.
WE WELCOME YOUR INPUT
Stakeholder feedback is an integral part of our sustainability reporting. Your feedback on this report or Shell’s oil sands activity is important to us. Please take a few minutes to complete this feedback form, e-mail us at dialogues-canada@shell.com or call 1-800-250-4355 with your comments.

<table>
<thead>
<tr>
<th>Where did you receive the report?</th>
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<tbody>
<tr>
<td>[ ] Shell open house</td>
</tr>
<tr>
<td>[ ] Other event</td>
</tr>
<tr>
<td>[ ] Shell head office</td>
</tr>
<tr>
<td>[ ] Shell field office</td>
</tr>
<tr>
<td>[ ] Passed on from a friend</td>
</tr>
<tr>
<td>[ ] Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is Shell reporting the right set of performance metrics?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Yes</td>
</tr>
<tr>
<td>[ ] No</td>
</tr>
</tbody>
</table>

Why or why not?

Please send your completed form to: Attention: Oil Sands Communications Shell Canada Limited 400-4th Avenue S.W. Calgary, Alberta, Canada T2P 2H5
### Do you believe Shell provides enough opportunities to ask questions or give feedback?

- [ ] Yes
- [ ] No

### What additional questions do you have or information would you like to receive?

- 
- 
- 

### Any other comments?

- 
- 
- 

### If you would like to receive a reply to your questions or more information, please provide your contact information:

<table>
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<tr>
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<th>Information</th>
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<td>Mailing address</td>
<td></td>
</tr>
<tr>
<td>Phone number</td>
<td></td>
</tr>
</tbody>
</table>

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APPENDIX

OVERALL
- Data cited in this report has been confirmed as of February 13, 2012. If substantial data changes occur after preparation of this report, they will be updated in next year’s publication.

CO₂
- Total CO₂e intensity is calculated on the basis of operational emissions. CO₂ intensity including offsets – this data is intended to show the efforts we are making to offset the impact of emissions from our operations and does not suggest a physical reduction in overall emissions or emissions intensity.

WATER
- The 2010 back data table included an error in the Scotford net fresh water consumption (indicated 3.1 when number should have been 3.4). The total water use # cited in the data table and charted was, however, correct.

LAND
- Note that Shell’s total active footprint for Jackpine Mine and Muskeg River Mine has been re-stated for 2010 as it was confirmed to be lower after publication of the 2010 report (Muskeg River mine 5,393 ha vs reported 6,246 and Jackpine Mine 2,708 ha vs reported 3,541). The 2010 Total Active Mine Footprints were overstated as the spatial data analysis technique was updated in 2011. 2010 data has been corrected with the updated analysis technique. The correct numbers for 2010 are 2708 (ha) and 5393 (ha) for 2010.

SOCIAL INVESTMENT
- Shell’s social investment spend does not include funding provided by Shell to aboriginal neighbors as part of mitigation agreements.