



**SHELL CANADA PEACE RIVER  
IN SITU EXPANSION  
Carmon Creek Project  
Public Information Document  
2009**





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## TABLE OF CONTENTS

Summary .....	03
History and Current Operations .....	05
Project Overview .....	06
Environment .....	09
Stakeholder Engagement .....	11
Regulatory Review .....	13

## COMPANY PROFILE

**S**hell Canada Limited (Shell) is a wholly owned subsidiary of Royal Dutch Shell plc. Shell first began operations in Canada in 1911. It is one of the largest integrated petroleum companies in Canada, producing natural gas, natural gas liquids, bitumen and sulphur. Shell is also a leading manufacturer, distributor and marketer of refined petroleum products. Shell currently employs more than 6,000 people across Canada.

Shell Canada Limited, as managing partner of Shell Canada Energy, proposes to apply for the regulatory approvals necessary to further develop its leases in the Peace River oil sands.



## SUMMARY

Shell Canada Limited (Shell), as managing partner of Shell Canada Energy, proposes to apply for the regulatory approvals necessary to further develop its leases in the Peace River area.

The current Shell Peace River Complex is licensed to produce up to 12,500 barrels of bitumen per day (2 000 cubic metres) using thermal (steam) recovery methods. In addition to its thermal operation, Shell also owns and operates two heavy oil facilities on its Peace River leases, which use cold (primary) recovery methods to extract bitumen from areas of the reservoir where the bitumen is fluid enough to be pumped to the surface unaided by steam.

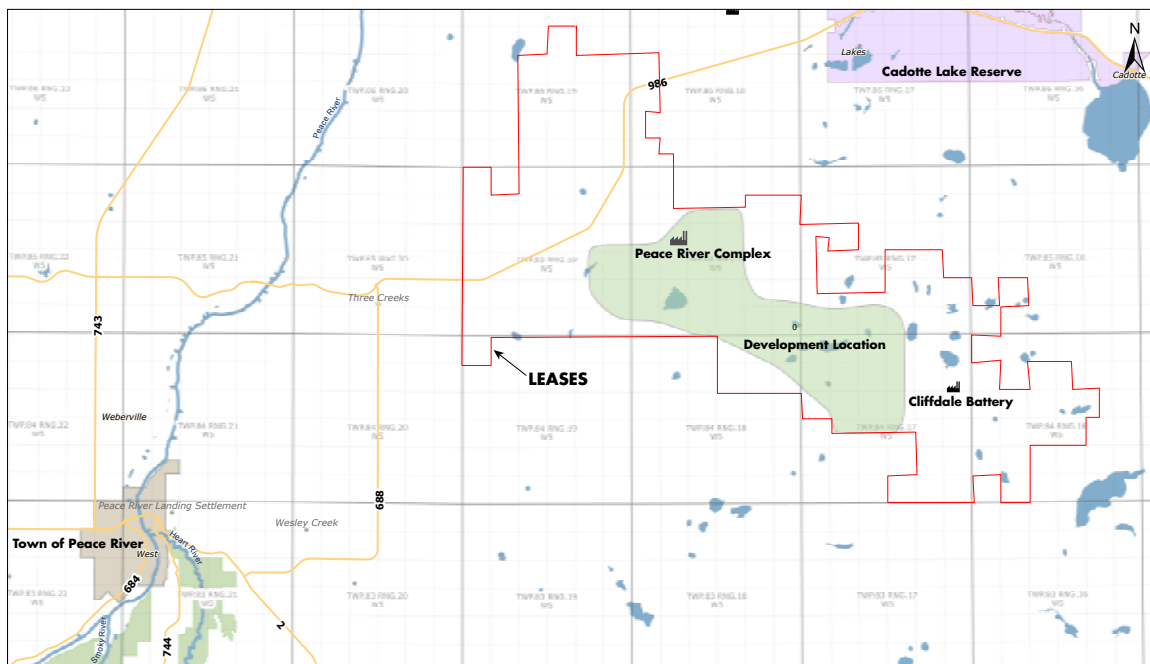
Shell is proposing to increase thermal bitumen production from its Peace River leases up to 80,000

barrels of bitumen per day (12 600 cubic metres) using vertical well steam drive technology.

Shell proposes to submit a project application to the regulators later in 2009. Shell invites public input as we continue to plan this development. Contact information appears on the back page of this document.

The purpose of this document is to describe Shell's preliminary plans for development, environmental impact assessment, timelines and consultation. The final development plan and schedule depends on the timing and outcome of the regulatory processes, the ability to meet our sustainable development criteria, market conditions, key economic indicators, final project costs, and ongoing consultation with key stakeholders.

## DEVELOPMENT LOCATION





## HISTORY AND CURRENT OPERATIONS

**S**hell has a long history of operations in the Peace River area. Since obtaining the leases in the 1950s, Shell has tested a number of technologies to efficiently and economically develop this resource. Shell began producing bitumen from its leases using steam recovery methods in 1979 with the Peace River In Situ Project (PRISP). The existing Peace River Complex was started up in 1986 as part of the Peace River Expansion Project (PREP). In 2004, Shell began assessing opportunities to expand its bitumen production. In 2006, it acquired the assets of another operator in the area, adding additional leases and two cold production facilities to its area assets. Later in the year it submitted an application for the Carmon Creek Project, a 100,000-barrels-per-day (15 900 cubic metres) expansion project. Following additional technical and review work, which resulted in changes to the initial application, Shell elected to withdraw this application in November 2008 and prepare and submit a new Carmon Creek application. This new application will use much of the work that was conducted for the original application as well as integrate work associated with the changes to the project. This document summarizes the scope and timing of this new application.



## PROJECT OVERVIEW

The Carmon Creek Project will produce up to 80,000 barrels per day of bitumen (12 600 cubic metres) using vertical well steam drive technology. The development will comprise the following:

- Vertical deviated wells that are clustered into well pads. The pattern of wells and pads, and the amount of deviation built into the individual well designs, will be optimised to minimise the number of wells and pads required to achieve the steam drive objective. Well pad locations will be finalised once this has been done. Shell proposes to construct and tie-in new well pads as necessary to maintain production volumes over the life of the project
- A pipeline distribution and gathering system that will connect the well pads to central processing facilities. The pipeline system will distribute steam to the well pads, and gather produced fluids from the wells for routing back to the central processing facilities.
- Central processing facilities that separate the produced fluids into oil, water, and gas.
  - The oil will be treated and then diluent will be added to reduce its viscosity before it is exported via pipeline to the Haig Lake terminal.
  - The produced water will be treated to remove solids and residual hydrocarbons, and then re-used to make steam.
- The gas will be treated to remove hydrogen sulphide ( $H_2S$ ) and associated carbon dioxide ( $CO_2$ ), and then used as fuel to produce the steam.
- The removed  $H_2S$  acid gas stream and associated  $CO_2$  will be re-injected into suitable strata beneath the bitumen reservoir.
- The steam will be generated primarily using new cogeneration facilities, although some steam boiler back-up might be required. The cogeneration units will enable the production facilities to be self-sufficient in electrical power. Any excess power generated will be exported to the provincial grid system for sale to public consumers.
- The steam injected into the reservoir will reduce the bitumen viscosity enough to allow it to flow through the reservoir to the well bore. However, since system pressure will be insufficient to push the bitumen to the surface unaided, pumps will be used to bring the bitumen to the surface. These will be driven using power distributed from the cogeneration units.
- The gas produced with the bitumen will be insufficient to generate all of the steam required for bitumen production, so additional natural gas will be needed. Diluent, to reduce bitumen viscosity, will also be needed. These, together with other supporting elements, will be provided via utility, offsite and infrastructure tie-in facilities.

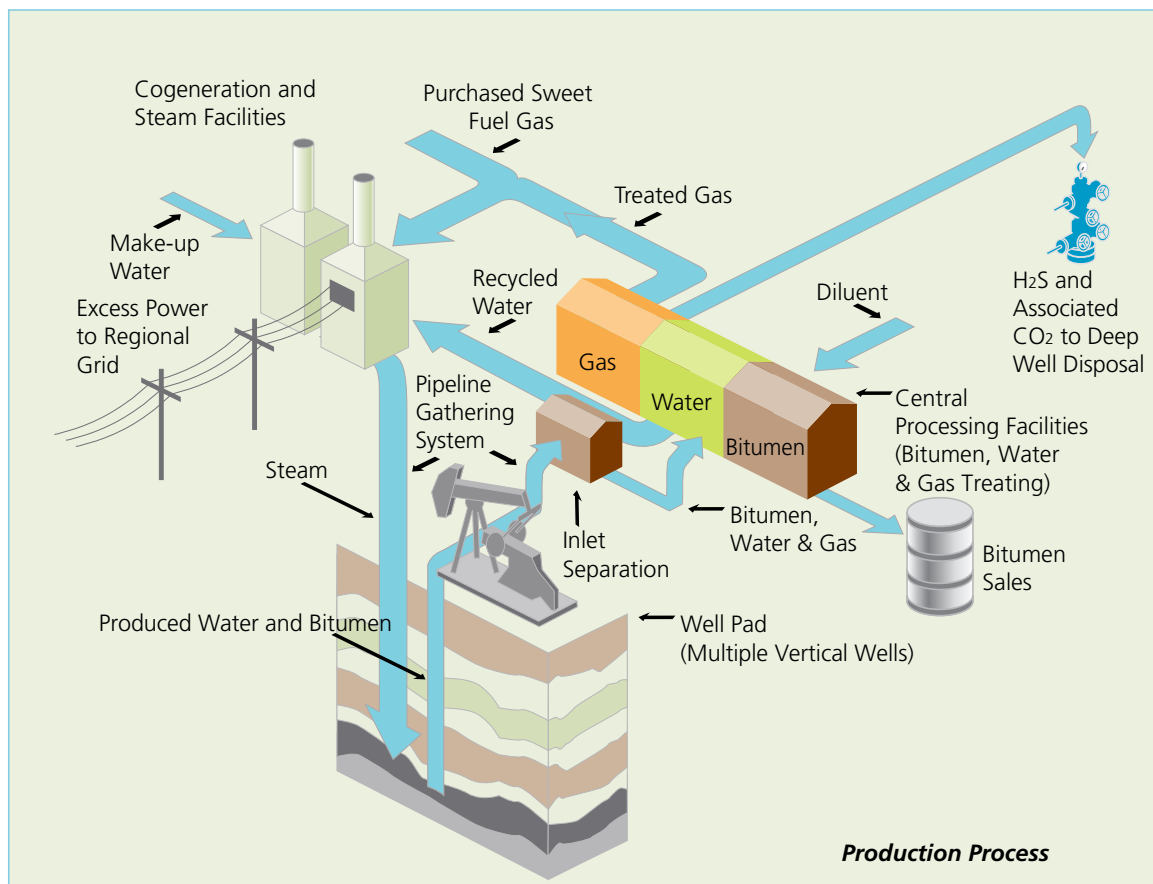


## PROJECT OVERVIEW *(cont'd)*

The water required for steam generation will be separated from the produced bitumen, and re-used. However, this can not happen until bitumen production is under way. As a result, for a temporary period during the start-up of each phase it will be necessary to take some water from the Peace River to generate steam until sufficient steam has been injected into the reservoir to enable the bitumen to be produced. Some make-up water may also be required from time to time. The primary source of make-up water will be brackish (non-potable) water taken from a subsurface aquifer. Based on

the variability of the amount of make-up water needed for the first few years of operation, it may be necessary to supplement the brackish make-up water with some fresh water from the Peace River. Fresh water will be needed for potable use.

Other activities connected to the project include the review of airstrip options; which may include upgrades to the existing municipal airstrip or construction of a new private airstrip in the project area; tankage upgrades at the Haig Lake terminal; and provision of electrical transmission lines (including connection to the provincial grid).





## ENVIRONMENT

The proposed development location is located in an area with northern boreal forest. Land use activities near the development location include farming and grazing activities to the south and west; hardwood and softwood logging operations; trapping activities; and other producers' natural gas and cold bitumen production activities.

## ENVIRONMENT

Shell is committed to designing, constructing and operating all its projects in a profitable and environmentally and socially responsible manner.

As part of the Carmon Creek Project Shell will prepare an Environmental Impact Assessment (EIA), which will identify potential environmental and socio-economic impacts of the project during construction, operation and reclamation of the project as well as mitigation measures. The scope of the EIA will include assessment of potential impacts associated with a 80,000-barrels-per-day (12 600 cubic metres) development.

Shell has more than 25 years of operating experience in the Peace River area and its current operations have a number of measures in place to protect the environment. Examples include: construction and monitoring of wildlife crossings over above-ground pipelines, use of existing disturbances where practical when building new facilities and planning new disturbances to avoid sensitive environmental areas, conducting pre-disturbance assessments, aligning linear disturbances into one right-of-way, and drilling multiple wells per pad to minimise surface impacts. The project will implement these existing environmental protection measures along with new best practices such as minimizing fresh water use, acid gas capture and subsurface re-injection, and re-use of well pad equipment. Ongoing reclamation of well pads at the end of their life span will help to minimise the overall footprint area of the new well pads being constructed during the project's lifespan.

Shell is working with other companies in the region to assess the cumulative effects of potential projects on the landscape to identify where there may be



opportunities for integrated land management to minimise impacts to the environment.

Shell is a partner in several collaborative research initiatives, which have occurred, or are occurring near its Peace River Complex. These include wetland reclamation trials, a boreal toad habitat study, a herptile habitat study and a completed wildlife crossing use study. Shell is also involved and has contributed to the NAIT Boreal Forest Research Centre in Fairview. The goal of its participation in these research initiatives is to identify possible impacts and assess opportunities to enhance best management practices.



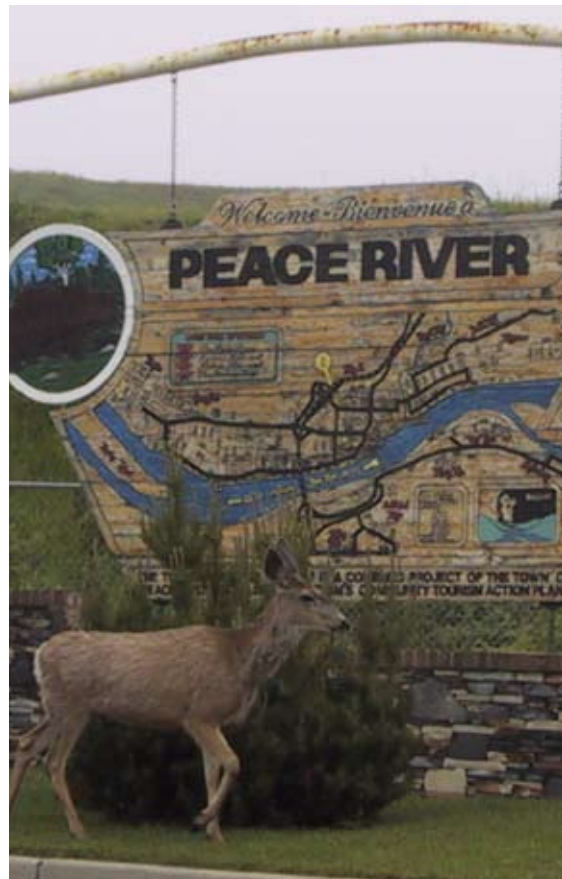
## STAKEHOLDER ENGAGEMENT

**S**hell will work with its neighbours and surrounding communities to maintain positive long-term relationships.

- It will consult early, and continue to consult with people throughout the life of project.
- It will, on an ongoing basis, involve its neighbours in decisions that impact them with the objective of finding solutions that both parties view as positive over the long term.
- It will construct and operate its operations in an environmentally responsible and economically robust manner.
- It will provide opportunities to local businesses where they are competitive and can meet Shell's contracting requirements.

Shell will continue to provide information on the project and seek input from the public on its activities via the following opportunities:

- Public notice of the project
- The Environmental Impact Assessment (EIA) conducted for the project
- One-on-one discussions, community meetings, open houses, website, etc.
- Regulatory review process





## ECONOMIC BENEFITS

The Carmon Creek Project will provide significant benefits to the local communities, as well as Albertans and the Canadian economy, through employment, contracting and service and supply opportunities and through the payment of municipal taxes and provincial royalties.

## REGULATORY REVIEW

The Energy Resources Conservation Board is the primary regulatory agency responsible for determining whether the project is in the public interest. Alberta Environment determines whether the project has been designed in an environmentally acceptable way. The Alberta Utilities Commission will determine whether the cogeneration facilities are in the public interest.

Shell anticipates that in early 2009, Alberta Environment will ask the public to comment on a proposed Terms of Reference (TOR) for the Environmental Impact Assessment required for this project. Once finalised, the TOR will identify for the community, for stakeholders and for Shell the information required by the regulatory agencies to assess the potential environmental impacts of the project.

Shell is currently working to prepare the regulatory submissions for the project. The Energy Resources Conservation Board, Alberta Environment, and the Alberta Utilities Commission will seek public input at various stages throughout the regulatory review process. Shell's public consultation will continue through 2009 and throughout the life of the project.

Based on the current best estimate the schedule below outlines the major stages and timelines for the regulatory review and development of the project.

## PROPOSED TIMELINE

TASK	2009	2010	2011	2012	2013	2014
EIA, Socio-Economic Assessment & Application	■					
Regulatory Review Process		■	■			
Design/Construct/Startup			■	■	■	■

## CONTACT INFORMATION

For further information about the Carmon Creek Project please call toll-free 1-877-347-4355 or send an e-mail to [carmoncreek@shell.com](mailto:carmoncreek@shell.com)

[www.shell.ca](http://www.shell.ca)





