

# The case against the proposed Shell Jackpine oilsands mine expansion

## At a Glance

A joint federal and provincial review panel will conduct hearings this fall into a proposal to expand Shell Canada's Jackpine oilsands mine.

This backgrounder provides an overview of environmental issues related to the proposed mine expansion, based on the Oil Sands Environmental Coalition's submission to the joint review panel. The Pembina Institute is opposing the project as a member of the coalition, which includes the Alberta Wilderness Association and the Fort McMurray Environmental Association, and is represented by Ecojustice.

Our concerns about the proposed Jackpine mine expansion include impacts to:

**Wildlife** — Shell's assessment shows a higher level of cumulative impacts to wildlife and biodiversity at the regional level than any oilsands assessment previously tabled.

**Wetlands and forests** — Shell's environmental assessment projects that 18 per cent (185,872 hectares) of the wetlands in the regional study area will be lost or altered as a result of the Jackpine mine expansion and other industrial activity.

**Air quality** — Shell's environmental assessment shows nitrogen dioxide emissions (an air pollutant that has been linked to human respiratory problems) would exceed the legal air quality limits outlined in Alberta's new Lower Athabasca Regional Plan by two to three times in some areas.

**Acid deposition** — Modelling predicts that large areas of the oilsands region and 21 lakes in northeastern Alberta will exceed critical levels for acid deposition when all approved oilsands projects are completed. If the number of oilsands projects that are currently planned (but not yet approved) is also included, a total of 23 lakes would be pushed past the limit for critical levels of acidification.

**Water use** — Withdrawing water from the Athabasca River during low-flow periods puts stress on fish and other aquatic life, making it more difficult to reproduce, decreasing habitat and food sources, and jeopardizing the ability of many species to survive the winter.

**Climate change** — The Shell Jackpine Mine expansion represents a significant increase in greenhouse gas pollution and is a step away from, rather than toward, meeting federal and provincial climate commitments.

This backgrounder contains a brief overview of each of the above concerns; for a more detailed discussion of each issue, please see the coalition's complete submission, which is available at: <http://www.ceaa.gc.ca/050/document-eng.cfm?document=81969>

## Overview

### About the project

The first phase of Shell Canada's Jackpine oilsands mine was approved in 2004 and began operations in August 2011.<sup>1</sup> Located roughly 70 km north of Fort McMurray on the east side of the Athabasca River in Alberta's Boreal Forest, the mine is approved to produce up to 200,000 barrels of bitumen per day. In late 2007, Shell released a proposal to increase production at the facility by 100,000 barrels per day by establishing additional mining areas and associated processing facilities, utilities and infrastructure.<sup>2</sup> The Jackpine mine expansion project is currently under environmental review by a joint federal and provincial panel, and the public hearing into the project begins October 29, 2012.<sup>3</sup>

### Considering the cumulative impacts of oilsands expansion

Under Canadian law, large projects like oilsands mines and mine expansions trigger a cumulative effects assessment (CEA) to determine what impacts the project will have on the environment, combined with other developments in the area. The assessment is also meant to inform decision-making about whether, given those likely impacts, approving the project is in the public interest.

For the Jackpine mine expansion project, Shell Canada's initial environmental assessment failed to take into account at least 11 planned oilsands projects, logging plans for forest companies that share the same landscape, mandatory exploration disturbance from over a million hectares of oilsands leases, and the impact of forest fires on a landscape that burns frequently. The Oil Sands Environmental Coalition raised these issues with Shell and the Government of Alberta, but they declined to address these errors. In December 2011, as a member of the coalition, the Pembina Institute wrote to the joint federal-provincial panel charged with reviewing the Shell Jackpine expansion project to highlight these significant omissions in the environmental assessment.<sup>4</sup>

The Pembina Institute's analysis found that, by failing to take these and other known disturbances into account, Shell's application would underestimate the cumulative environmental footprint in the region by a factor of 12.<sup>5</sup> And without considering the impacts of the Shell project in conjunction with the impacts from other disturbances in the area, the panel could not know if the project would exceed environmental thresholds and result in unacceptable environmental impacts overall.

This spring, Shell tabled a precedent-setting revision to its environmental assessment.<sup>6</sup> Shell's new environmental assessment reveals the cumulative impacts of proposed developments over thousands of hectares of habitat in Canada's Boreal Forest, along with the logging commitments that have been made and the likely rate of forest fires that cannot be prevented. Accounting for anticipated impacts at such a detailed and comprehensive level is critically important given the planned expansion of oilsands development in the region; the data Shell has included in its application will give the public and decision makers a more complete picture of environmental consequences from oilsands development using current technologies and practices.

### Why the Pembina Institute is opposing the Jackpine mine expansion

Shell's environmental assessment shows that expanding the Jackpine oilsands mine will harm fish and wildlife, damage wetlands and old growth forests, pollute the air and cause the acidification of land and lakes. It will leave a legacy of toxic waste, damage two significant rivers, and produce greenhouse gas pollution that will push Canada's and Alberta's climate targets further out of reach.

When we consider Shell’s proposal in the context of all the other industrial activity currently taking place or planned for the oilsands region, it becomes clear that the cumulative impacts of oilsands expansion can have significant consequences for our environment — in some cases causing chronic or irreversible harm.

Further, there appears to be no system for reporting by Alberta and Canada and their regulatory agencies on whether or not project proponents follow through on the recommendations made by past oilsands joint review panels. In other words, the panel could make numerous recommendations to Shell in hopes of mitigating the negative impacts of this project, but there is currently no system in place to track how, or if, the company takes action in line with those recommendations.<sup>7</sup>

Shell’s proposal to expand the Jackpine oilsands mine does not include adequate measures to prevent, reduce or mitigate the negative impacts related to the project. Without those measures, and strict conditions (rather than recommendations) requiring their implementation, it would be irresponsible to approve this project.

## Key concerns about the Jackpine mine expansion

### Impacts on wildlife

*Shell’s assessment shows a higher level of cumulative impacts to wildlife and biodiversity at the regional level than any oilsands assessment previously tabled.*<sup>8</sup>

The cumulative effects of planned industrial activity for the oilsands region would breach many of the regional ecological thresholds for the protection of wildlife habitat and species at risk. If Shell’s Jackpine mine expansion and other proposed developments in the region are approved, 13 of 22 assessed species will lose more than 20 per cent of their high-value habitat in the 2.3 million hectare terrestrial regional study area<sup>9</sup> — a threshold identified in a previous oilsands mine review decision (for the Total Joslyn mine) as representing a significant adverse effect.<sup>10</sup>

Species	Predicted habitat loss (from natural condition)
Canada Warbler	61%
Woodland Caribou	47%
Black-throated Green Warbler	44%
Barred Owl	43%

Table 1. Predicted habitat loss related to the cumulative effects of the proposed Shell Jackpine mine expansion and other development in the oilsands region.

One of the challenges for decision makers in assessing impacts on wildlife is the lack of binding standards for the protection of habitat and species in the oilsands region. The Terrestrial Ecosystem Management Framework developed by the Cumulative Effects Management Association (CEMA) identifies the ecological threshold for habitat disturbance at 10-20 per cent below the limit of the range of variability that exists in nature. Shell’s environmental assessment indicates that, when all planned (i.e. approved or proposed) development is taken into account along with the impacts of the Jackpine mine, the habitat threshold according to CEMA for old growth birds, moose, caribou and fisher are likely to be exceeded. However, CEMA’s Framework has not yet been fully adopted by the Government of Alberta.<sup>11</sup>

Furthermore, the province's Lower Athabasca Regional Plan was approved in August 2012 but the Biodiversity management framework does not yet exist and is not planned to be developed until 2013.

**Bottom line:** The proposed level of impact on valued wildlife species and species at risk clearly exceeds ecological thresholds and is contrary to the stated policy goals for the region. Shell has not identified adequate mitigation to address these impacts, nor has any regional mitigation been identified that would ensure that wildlife objectives will be met for the region.<sup>12</sup>

## Wetlands and forests

*Shell's environmental assessment projects that 18 per cent (185,872 hectares) of the wetlands in the regional study area will be lost or altered as a result of the Jackpine mine expansion and other industrial activity.*<sup>13</sup>

The destruction or degradation of wetlands has serious impacts on old-growth forests (making them more susceptible to forest fires, and contributing to a loss of biodiversity) and species that live in them (such as woodland caribou, or the Canada warbler) — yet Shell's environmental assessment has underestimated the potential for loss of old-growth forest.<sup>14</sup>

Once mining destroys the extensive freshwater peat wetlands that are integral to Alberta's northern forests, they are very difficult to recreate, requiring precise moisture and soil conditions over centuries. The marshes that have been reconstructed to date, and which Shell proposes as substitutes for the original wetlands, are salty and support fewer species.<sup>15</sup> This wetland loss has serious consequences for species, including woodland caribou, western boreal toad, rusty blackbird and yellow rail. While the oilsands industry has yet to demonstrate that peat wetland reclamation is actually possible, projects continue to be approved at an "unprecedented" pace and scale.<sup>16</sup>

Alberta's draft wetland policy (2010) says destruction of peatlands should be a "last resort" and require compensation to replace wetland value<sup>17</sup> — but Shell hasn't proposed any way to adequately compensate for the loss of peatlands, wetlands or old-growth forest resulting from its mine expansion.<sup>18</sup>

**Bottom line:** The proposed Jackpine mine expansion should not be approved without a proven plan to replace wetlands on site to the same extent that they occurred on the landscape before development, and a requirement to conserve wetlands and old-growth forest elsewhere that would otherwise be degraded or destroyed as a way to compensate for the damage caused.<sup>19</sup>

## Air quality

*Shell's environmental assessment shows nitrogen dioxide emissions — an air pollutant that has been linked to human respiratory problems — would exceed the legal air quality limits outlined in Alberta's new Lower Athabasca Regional Plan by two to three times in some areas.*<sup>20</sup>

The World Health Organization has found that long-term exposure to nitrogen dioxide (NO<sub>2</sub>) in the air can reduce lung health and development and increase bronchitis symptoms in children with asthma.<sup>21</sup> Classified as a “criteria air contaminant” in Canada for its potential impact on human health, NO<sub>2</sub> also contributes to poor air quality and acid deposition.

Alberta's Lower Athabasca Regional Plan, finalized in August 2012, requires the provincial government to take mandatory action to bring emissions back to acceptable levels (such as restricting additional sources of emissions and/or requiring emissions reductions) and proactive action to ensure limits are not exceeded.<sup>22</sup> Given that Shell's environmental assessment shows air pollution in some areas would exceed the legal limits outlined in the regional plan, the proposed Jackpine mine expansion serves as a litmus test of the new provincial rules.

**Bottom line:** If the province is serious about protecting air quality in the oilsands region, it's going to have to start saying 'no' to some types of industrial activity — and Shell's proposed Jackpine mine expansion is the first test of Alberta's new land management rules.

## Acid deposition

*Modelling predicts that large areas of the oilsands region and 21 lakes in northeastern Alberta will exceed critical levels for acid deposition when all approved oilsands projects are completed. If the number of oilsands projects that are currently planned (but not yet approved) is also included, a total of 23 lakes would be pushed past the limit for critical levels of acidification.*<sup>23</sup>

When acid falls on the landscape, it can alter the chemistry and nutrient balance of lakes and soils, making it more difficult for species to thrive and reproduce, and damaging the ecosystem as a whole.<sup>24</sup> The Alberta government's Acid Deposition Management Framework sets limits for the emissions that cause acid rain and other forms of acid deposition, to prevent long-term irreversible harm to vegetation and lake ecosystems and to keep clean areas from becoming contaminated. Sulphur and nitrogen compounds in the air contribute significantly to acidification, and Shell's proposed project is a major source of acid-forming air pollution.

The provincial framework mandates that action must be taken to maintain low levels of acid deposition in relatively “clean” areas and to prevent areas that are becoming acidified from exceeding critical levels.

Acid levels in the oilsands region are assessed every five years, so the pace of expansion makes it challenging to prevent acidification levels from being exceeded between assessment periods. Modelling shows that the amount of acidification associated with oilsands projects that have already been approved

contradicts the intent of the framework and exceeds limits for the region. For this reason, it would be irresponsible to approve another project that would lead to further acidification.<sup>25</sup>

**Bottom line:** Shell's proposed Jackpine mine expansion would further increase air pollution and acid deposition in the oilsands region, and the company's proposal does not include sufficient mitigation measures to make it align with provincial regulations or the public interest.

## Water use

*Withdrawing water from the Athabasca River during low-flow periods puts stress on fish and other aquatic life, making it more difficult to reproduce, decreasing habitat and food sources, and jeopardizing the ability of many species to survive the winter.*

Extracting bitumen from the Jackpine mine requires large volumes of water from the Athabasca River. These industrial water withdrawals represent a risk to the river's ecosystem, particularly on the Lower Athabasca River, where average low-flow levels decreased 30 per cent over a 40-year period.<sup>26</sup>

To support the Jackpine mine expansion, Shell is proposing to increase the amount of water it is allowed to withdraw from the Athabasca River by 18 million cubic metres per year<sup>27</sup> — roughly the amount of water that would be needed to fill an Olympic-sized swimming pool for every person living in Banff, Alberta.<sup>28</sup>

Along with existing and approved projects, the cumulative impact of water use will change the volume of water flowing in the Athabasca River, which can cause significant issues for the river ecosystem during low-flow periods. Shell plans to store enough water to avoid taking water from the river for up to 30 days during low-flow periods, but this plan is not consistent with recent approvals for other oilsands mines, which require water storage capacity for up to 90 days.<sup>29</sup>

Furthermore, independent and government analysis has found that water monitoring in the Athabasca region is inadequate; flow levels are currently overseen by the Regional Aquatics Monitoring Program (RAMP) and Shell's own monitoring.

The federal and provincial governments are overdue to establish and enforce an ecological base flow limit for the Athabasca River, which would restrict the withdrawal of water during low-flow periods. Such a limit has been recommended in various joint review panel decisions over the past eight years and in independent reviews of water management policies and practices in the region.<sup>30</sup>

**Bottom line:** In the absence of an ecological base-flow limit, water withdrawals should be prohibited during low-flow periods to ensure that the Shell Jackpine mine expansion does not contribute to damaging the river ecosystem.

## Climate change

*The Shell Jackpine Mine expansion represents a significant increase in greenhouse gas pollution and is a step away from, rather than toward, meeting federal and provincial climate commitments.*

Both Alberta and Canada have made formal commitments to reduce greenhouse gas emissions, but neither has implemented policies or plans that are adequate to deliver the necessary reductions.

According to the assessment for the Jackpine mine expansion, Shell appears to have made no improvement to the amount of greenhouse gas pollution associated with each barrel of bitumen produced by the mine since the first phase of the project was approved eight years ago.<sup>31</sup>

The proposed expansion has an emissions intensity of 32.3 kilograms of carbon dioxide equivalent (CO<sub>2</sub>e). Over the project's lifespan, the Jackpine mine expansion would add 1.18 megatonnes of greenhouse gas emissions to the atmosphere each year. That represents a 2.5 per cent increase in total oilsands emissions or 0.5 per cent increase provincially (from 2010 levels) and does not include emissions from upgrading, refining, or burning the fuel in vehicles.<sup>32</sup>

Under current federal and provincial policies, Canada is on track to fall short of its 2020 targets by nearly 50 per cent.<sup>33</sup> Emissions from the oilsands are projected to grow more than any other sector of Canada's economy between 2010 and 2020,<sup>34</sup> so approving a project that would contribute further to the growth in emissions and does not propose adequate measures to cut its emissions is inconsistent with the climate commitments at both the provincial and federal levels. Rejecting the proposed expansion would move Alberta a step closer to meeting its 2020 emissions reductions targets.<sup>35</sup>

**Bottom line:** Alberta and Canada's current climate policies will not deliver the emission reductions necessary to meet our commitments. Shell's proposed mitigation efforts are too vague and weak to assure Canadians that the company plans to reduce, eliminate or offset greenhouse gas pollution from this project in keeping with the need to reduce overall and per-barrel emissions from the oilsands sector.

## Key resources

- The Oil Sands Environmental Coalition's written submission to participate in the hearing: <http://www.ceaa.gc.ca/050/document-eng.cfm?document=81969>
- Shell's revised environmental assessment for the Jackpine mine expansion project: <http://ceaa.gc.ca/050/document-eng.cfm?document=56367>
- Pembina Institute blog post: "Environmental review of oilsands project doesn't fit federal government's script" (June 26, 2012) <http://www.pembina.org/blog/636>
- Pembina Institute blog post: "Shell's 'too good to be true' environmental assessment leaves decision-makers relying on faulty data" (Dec. 6, 2011) <http://www.pembina.org/blog/597>

## Notes

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- <sup>1</sup> Carol Christian, “Shell opens Jackpine mine.” *Fort McMurray Today*. August 29, 2011. <http://www.fortmcmurraytoday.com/2011/08/29/shell-opens-jackpine-mine>
- <sup>2</sup> *Shell Canada Oil Sands Expansion: Jackpine Mine Expansion and Pierre River Mine, Public Disclosure*. January 2007. Available at: [http://environment.alberta.ca/documents/Shell\\_Jackpine\\_Pierre\\_PDD.pdf](http://environment.alberta.ca/documents/Shell_Jackpine_Pierre_PDD.pdf)
- <sup>3</sup> For a detailed timeline related to the review of the Jackpine mine expansion proposal, see the “Milestones” list at the website of the federal Major Projects Management Office: <http://www2.mpmo-bggp.gc.ca/MPTracker/project-projet-03.aspx?pid=111&psid=3>
- <sup>4</sup> Karin Buss, "Response to the Request for Public Comment on the Adequacy fo the Environmental Impact Statement (From Karen [sic] Buss on behalf of Oil Sands Environmental Coalition to Joint Review Panel)." (Ackroyd LLP, December 6, 2011). <http://www.ceaa.gc.ca/050/document-eng.cfm?document=53546>
- <sup>5</sup> Simon Dyer, “Shell’s ‘too-good-to-be-true’ environmental assessment leaves decision makers relying on faulty data.” (Pembina Institute blog post, December 6, 2011) <http://www.pembina.org/blog/597>
- <sup>6</sup> Shell Canada, “Response to Supplemental Information Requests of January 30, 2012.” <http://ceaa.gc.ca/050/document-eng.cfm?document=56367>
- <sup>7</sup> Ecojustice Canada, *Submission by the Oil Sands Environmental Coalition. [OSEC Submission]*, 11. *October 1, 2012*. <http://www.ceaa.gc.ca/050/document-eng.cfm?document=81969>
- <sup>8</sup> For a detailed list of species facing significant habitat loss from the proposed Shell Jackpine mine expansion, see *OSEC Submission*, 17.
- <sup>9</sup> The regional study area is a large area around the project where cumulative effects are assessed. It’s boundaries are different for each of the environmental parameters studied. The local study area, referred to in the full OSEC submission, is the small area within the footprint of the mine site itself.
- <sup>10</sup> See *OSEC Submission*, 17.
- <sup>11</sup> For more information about ecological thresholds, see *OSEC Submission*, 20-23.
- <sup>12</sup> See *OSEC Submission*, 25.
- <sup>13</sup> See *OSEC Submission*, 26.
- <sup>14</sup> See *OSEC Submission*, 29.
- <sup>15</sup> Lee Foote. “Threshold considerations and wetland reclamation in Alberta’s mineable oil sands.” *Ecology and Society* 17, no.1 (2012). Pages 4-5 in PDF version, <http://www.ecologyandsociety.org/vol17/iss1/art35/> Cited in *OSEC Submission*, 28.
- <sup>16</sup> Rebecca Rooney, “Alberta Oil Sands.” [http://www.biology.ualberta.ca/faculty/suzanne\\_bayley/?Page=6444](http://www.biology.ualberta.ca/faculty/suzanne_bayley/?Page=6444)
- <sup>17</sup> Government of Alberta, *Wetlands – Policy Intent, Draft* (2010), 5. Cited in *OSEC Submission*, 30.
- <sup>18</sup> See *OSEC Submission*, 29.
- <sup>19</sup> See *OSEC Submission*, 12.
- <sup>20</sup> Government of Alberta, *Lower Athabasca Regional Air Quality Management Framework for Nitrogen Dioxide (NO<sub>2</sub>) and Sulphur Dioxide (SO<sub>2</sub>)* (2012), 33. Cited in *OSEC Submission*, 35.
- <sup>21</sup> World Health Organization, “Air quality and health.” <http://www.who.int/mediacentre/factsheets/fs313/en/index.html> (accessed September 3, 2012)
- <sup>22</sup> See *OSEC Submission*, 34.
- <sup>23</sup> See *OSEC Submission*, 43.
- <sup>24</sup> Environmental Protection Agency, “Environmental effects of acid rain.” <http://www.epa.gov/region1/eco/acidrain/enveffects.html>
- <sup>25</sup> See *OSEC Submission*, 45.
- <sup>26</sup> A. J. Squires, C. Westbrook, and M. G. Dube, “An approach for assessing cumulative effects in a model river, the Athabasca River basin,” *Integrated Environmental Assessment and Management* 6, no.1, 119–134.
- <sup>27</sup> See *OSEC Submission*, 45.

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<sup>28</sup> Calculation based on Banff's population of 7584 as reported by Statistics Canada in the 2011 census, and a standard FINA-regulated swimming pool volume of 2500 m<sup>3</sup>. "Focus on Geography Series, 2011 Census – Census subdivision of Banff, T – Alberta," (Statistics Canada, 2011). <https://www12.statcan.gc.ca/census-recensement/index-eng.cfm>

<sup>29</sup> According to Total's description of the Joslyn project, the company's 90-day operational water storage system "exceeds industry standards and reduces the impact of water withdrawal from the Athabasca River during low flow conditions in winter months, when aquatic life conditions are most sensitive." Total E&P Canada, "Joslyn Asset." <http://www.total-ep-canada.com/upstream/joslyn.asp>

<sup>30</sup> See *OSEC Submission*, 51.

<sup>31</sup> See *OSEC Submission*, 52.

<sup>32</sup> For a detailed explanation of greenhouse gas emissions related to the proposed Jackpine mine expansion, see *OSEC Submission*, 51-52.

<sup>33</sup> It can be argued that Canada is further than 50% away from its target given that 25 Mt of the reductions to date result from new accounting rules established by the UN for forestry and land-use change. This new accounting was applied only to current emissions not retro-actively to 2005 levels upon which Canada's targets were set. See P.J. Partington, "Are we there yet? Closing the gap on Canada's climate commitments." (Pembina Institute blog post, August 9, 2012.) <http://www.pembina.org/blog/643>

<sup>34</sup> See *OSEC Submission*, 53-54.

<sup>35</sup> Alberta's climate change plan, published in 2008, sets a target to reduce annual emissions 14 per cent below 2005 levels by 2050, or a 50 Mt reduction below business as usual by 2020. For more details on provincial and federal climate targets, policies and plans, see *OSEC Submission*, 59.