

**IN THE MATTER OF THE JOINT REVIEW PANEL ("JOINT PANEL")
ESTABLISHED TO REVIEW THE JOSLYN MINE NORTH PROJECT ("PROJECT")
PROPOSED BY TOTAL E&P CANADA LTD. ("TOTAL")**

**AND IN THE MATTER OF ALBERTA ENERGY RESOURCES CONSERVATION
BOARD ("ERCB") APPLICATION NO. 1445545**

**AND IN THE MATTER OF CANADIAN ENVIRONMENTAL ASSESMENT AGENCY
("AGENCY") REFERENCE NO. 08-05-37519**

**AND IN THE MATTER OF THE CANADIAN ENVIRONMENTAL ASSESMENT ACT
("CEAA"), S.C. 1992, C. 37, S. 16**

**AND IN THE MATTER OF THE OIL SANDS CONSERVATION ACT, R.S.A. 2000, C.
O-7, S. 10**

**AND IN THE MATTER OF THE ENERGY RESOURCES CONSERVATION BOARD
RULES OF PRACTICE, ALTA. REG. 252/2007, S. 9**

AFFIDAVIT OF SIMON DYER

I, **SIMON DYER**, of Calgary, Alberta, make oath and say that:

1. I am the Oil Sands Program Director at the Pembina Institute for Appropriate Development ("Pembina Institute") in Calgary, Alberta. I am a registered professional biologist I hold a Master of Science in environmental biology and ecology from the University of Alberta, and a Master of Arts in natural sciences from the University of Cambridge in England. From 1999 to 2005 I was employed by AI-Pac as a wildlife biologist and Forest Ecology Program Manager. I am the co-author of a number of publications related to the management of terrestrial environmental impacts of oil sands development including *Death by a Thousand Cuts: Impacts of In-situ Oil Sands Development on Alberta's Boreal Forest* and *Haste Makes Waste: the Need for a New Oil Sands Tenure Regime*.
2. I represented the Pembina Institute on the Sustainable Ecosystems Working Group ("SEWG") of the Cumulative Environmental Management Association ("CEMA") during the time that the Terrestrial Ecosystems Management Framework ("TEMF") was created. I have reviewed the portions of the Environmental Impact Assessment and supplemental information (collectively referred to as "the EIA") filed by Total E&P Joslyn Ltd. related to the assessment of cumulative effectives on terrestrial resources and wildlife. I oversaw the preparation of OSEC's information request to Total and reviewed Total's response. As such, I have personal knowledge of the matters to which I depose

in this affidavit, except where otherwise stated to be based upon information and belief, in which case, I verily believe the facts and matters to be true, based on the best evidence available.

3. CEMA is a multi-stakeholder organization comprised of members representing industry, provincial, federal and municipal governments, Aboriginal communities and environmental nongovernmental organizations. CEMA's mandate is to develop cumulative effects management frameworks for all environmental media within the Regional Municipality of Wood Buffalo ("RMWB"), including air, water, and land.
4. The TEMF was created, in part, because Alberta's Regional Sustainable Development Strategy ("RSDS") identified the research and management of the cumulative impacts on fish, wildlife and ecosystems as a priority" related to the cumulative effects of development on fish, wildlife, and ecosystems. SEWG studied these issues over a 2.5 year period and developed the TEMF.
5. The TEMF recommended a triad approach which included conservation areas and maximum levels of intensive development, to mitigate the cumulative effects of development and resource use on ecosystems and landscapes at a regional scale. Attached as **Exhibit 1** to my affidavit is the Press Release and "backgrounder" providing an overview of the TEMF published by CEMA On June 05, 2008.
6. Attached as **Exhibit 2** to my affidavit is a copy of the TEMF published by CEMA June 05, 2008. CEMA recommended a variety of immediate actions by taken to protect wildlife. The research and modeling that was done to develop the TEMF was accepted and considered reliable and valid by SEWG and CEMA. Key findings are summarized in Exhibit B at page 12 and 13 included:
 - Rapidly increasing oil sands development is the key driver of landscape change in the RMWB due to the increasing footprint on the land and the long duration of the footprint.
 - Both mining and in situ developments must be considered intensive land uses due to their impacts on environmental indicators.
 - The landscape has already been substantially altered in the RMWB and will continue to change due to development in the future.
 - Most environmental indicators of terrestrial ecosystems will decline outside their natural range of variation (NRV) with continued development in the absence of management intervention.
 - Indicators of native fish integrity, fisher, moose and black bear are already below their NRV and will continue to decline.

- Linear feature (footprint) density is a key driver of declines in environmental indicator performance, both through their direct impact on landscape structure and through their use by humans and predators.
7. We found through our work in developing the TEMF that some species were already adversely affected or significantly adversely affected by oil sands development in the RMWB. Fish and woodland caribou were determined to be in a "red" condition - meaning that modeling and monitoring found these "indicators" were measures at more than 20% below the lower limit of the Natural Range of Variation (NRV), or modeling predicted it will drop to this level within 15 years, in the RMWB. Fisher and Black bear habitat were found to be currently in a "yellow condition," meaning that it either monitoring measures it at 10-20% below the lower limit of the NRV, or modeling predicts it will drop more than 10% below the lower limit of the NRV within 30 years, both measured across the entire RMWB. This is why we recommended immediate action be taken to reverse this trend.
 8. CEMA's assessment of the impacts of regional development on terrestrial resources included all key impacts, including forest fires and forest harvesting. Attached at **Exhibit 3**, "Natural Level of Forest Age-class Variability on the RSDS Landscape of Alberta," prepared by Silvatech Group, consultants retained by SEWG, explaining the methodology. In section 5.5.1.1, at pages 15 and 16, of this report explains how forest fires were taken into account through modeling using reference documents published by CEMA. Section 5.5.1.2., at pages 17 and 18, summarizes how forest harvesting was taken into account and the calculations of forest harvesting using AI-Pac data.
 9. Both exhibits B and C have been available to CEMA members and the public since 2008.
 10. I have been advised by Margaret Luker, program manager, Sustainable Ecosystems Working Group, which I believe to be true from my own observations as a member of SEWG, that TOTAL was member of CEMA and an observer (but not an active participant) in SEWG during the time when the TEMF was developed.
 11. By letter dated May 06, 2008, TOTAL confirmed conditional support for TEMF through a letter from Mr. Ray Reipas, TOTAL's Vice-President for Mining, to Glen Semenchuk, CEMA Executive Director. It is attached as **Exhibit 4** to my affidavit.
 12. According to TOTAL's EIA, it was aware that the TEMF was being developed in 2006 as set out in "Joslyn North Mine Project, Section A: Project Introduction", February 2006, page A-52. The TEMF was cited as a monitoring and mitigation strategy.
 13. However, the 2010 Total states that, "SEWG is developing a management framework," even though CEMA completed its assessment and submitted the

TEMF to the Government of Alberta in 2008. See TOTAL E&P Joslyn Ltd., "Joslyn North Mine Project, Section 14: Environmental Assessment", February 2010, Pg. 149-159. I verily believe this to be false based on my personal involvement in the TEMF and the documents attached to my affidavit as Exhibits A to D.

14. TOTAL states on page 74 of its July 2010 Additional Information, that, "[d]etermining significance is best done in the context of accepted resource objectives or ecological thresholds for the resource in question. A project or cumulative effect is considered significant when it exceeds a threshold of what is considered acceptable. Several initiatives in the oil sands region are working to establish goals and thresholds for biodiversity. At this time however, thresholds for wildlife habitat have not been developed or the region." I am aware from my review of the letters of support from CEMA members for the TEMF, that the majority of members supported, or conditionally supported, the thresholds for wildlife set out in the TEMF. Alberta has not yet formally adopted the TEMF, but these are the best available thresholds available for wildlife in the Project's regional study area.
15. I reviewed TOTAL's EIA and it does not contain any consideration of the research or modelling done for the TEMF or the TEMF. TOTAL assessed impacts on Black Bear and Fisher in Section 14.14 of the AI Project Update but did not reference any of TEMF's work on black bear and fisher populations.
16. I reviewed the terms of reference set by Alberta Environment and, in section 5.1, they direct TOTAL to "demonstrate use of appropriate predictive tools and methods, consistent with CEMA, WBEA, RAMP and any other relevant initiatives, to enable quantitative estimates of future conditions with the highest possible degree of certainty". See Appendix 1 of 2006 Integrated Application, vol. 2.
17. In my opinion, CEMA's tools and methods and available information have not been integrated into the environmental assessment, including the assessment of significance. TOTAL submits in Table 14.14-3 in the AI Project Update with respect to the cumulative effects on wildlife, that the impacts are insignificant. The assessment of significance for cumulative impacts on wildlife is, in my opinion, underestimated by TOTAL

Forest Fires

18. I reviewed the Terms of Reference for the Project set by Alberta Environment, which is Registry Document #6. It states "[t]he [Environmental Impact Assessment] will include the following basic environmental information requirements for three assessment scenarios," including, at s. 5.1(e), "information about ecological processes and natural forces that are expected to produce changes in environmental conditions, e.g., forest fires, flood or drought conditions and predator-prey population cycles."

19. I reviewed the EIA prepared by Total and its does not include the likelihood of forest fires in its assessment of the impacts of its Project on terrestrial resources.
20. I reviewed a document published by the Alberta Energy Utilities Board, Alberta Environment, and Natural Resources Conservation Board entitled "Cumulative Effects Assessment in Environmental Impact Assessment Reports," which is attached as **Exhibit 5**. It advises proponents at page 3 to take into account natural events and activities such as forest fires in order to avoid adverse effects.
21. OSEC submitted an information request to TOTAL on August 05, 2010, registry document #214, requesting the following information about forest fires: "Did the cumulative environmental assessments of wildlife and vegetation include the modeled effects of future forest fires? If so please provide the assumptions and modeling results."
22. Total responded on August 24, 2010, registry document #222, stating on page 46 that, "The cumulative environmental assessment of wildlife and vegetation did not include the modeled effects of future forest fires. Future forest fires were not included as fire is a stochastic process and as such is not inherently predictive spatially."
23. CEMA (SEWG) has completed research and modelling based on on historic fire cycles in the RMWB. This is set out in detail in Bandaloo Landscape-Ecosystem Services, 2005. Natural Levels of Forest Age-Class Variability on the RSDS Landscape of Area (**Exhibit 3**) in these proceedings.
24. From this work and based on my professional opinion, I conclude that an average of 5,000 ha will burn each year in the RSA
25. In my opinion, forest fires are reasonably likely to occur during the life of the Total project and contribute to the cumulative impact of the Project on the environment.
26. Sections 5.6 (c), (g), and (j) of the Terms of Reference require that the EIA evaluate how the Project will effect current and future forestry and forest harvesting on the lands affected by the Project.
27. On June 21, 2010, the Joint Review Panel requested Total provide the following information (Registry document #183) regarding forestry:
 4. Provide a map of Forest Management Units of the Resource Management Area (RMA) relative to the Regional Study Area (RSA):
 - a. Provide a chart listing the annual allowable cut for each of the Forest Management Units within the RSA.
 - b. List the volume and area harvested in each of the last 5 years, and the next 25 years of projected harvests, broken down by areas harvested for oil sand projects, and normal harvest areas.
 - c. Include a breakdown for the coniferous and deciduous resources.

28. TOTAL response in its July 2010 Additional information at page 13 acknowledged that they did not consider any forest harvest after 2016 and assumes that there will be no forest harvesting outside of oil sands mining sites.
29. This assumption is incorrect, in my opinion for the following reasons:
- According the Al-Pac FMA Area Timber Supply Analysis (attached as **Appendix 6**) the forest management plan for Forest Management Area A15, where the proposed mine is located, has an approved annual allowable cut of 925,000 m³ per year. This is expected to drop to around 500,000 m³ per year after 2031.
 - Al-Pac operates Canada's newest and North America's largest single line bleached kraft pulp mill. The approved annual allowable cut of the forest companies must be met in order to furnish the mills
 - Al-Pac's timber supply analysis (attached as **Appendix 6**) shows how approximately 15,000 to 35,000 ha of forests in A15 can be expected to be harvested each year over the next 200 years. Al-Pac has an approved spatial harvest sequence (SHS) that prioritizes harvest in the mineable oil sands area until 2021 (attached as **Exhibit 13**).
 - Although the exact spatial harvest sequence has not been confirmed it is possible in my experience to incorporate planned forest harvest in the modeling of cumulative environmental impacts SEWG included annual forecasted forest yield in its detailed assessment of the impacts of regional development.

Future Reasonably likely Projects

30. The terms of reference set by Alberta Environment require that the environmental assessment include, "any planned project or activity that has been publicly disclosed prior to the issuance of the terms of reference or up to six months prior to the submission of the project application and EIA report, whichever is sooner."
31. The terms of reference for the Joint Review Panel are attached as **Exhibit 7**. Part III of the Appendix to those terms states that the, "Panel shall identify and assess the project's cumulative effects. Cumulative effects are those changes to the environment due to the project combined with the existence of other works or other past, present and reasonable foreseeable future projects."
32. When Total updated its EIA in February 2010, it included a list of projects that it had taken into account in the Planned Development Case (PDC) which it used to assess cumulative impacts. These projects are set out in Table 14.1-2 which is attached as **Exhibit 8** to my affidavit for convenience.
33. This list does not include the Frontier or Equinox oil sands mines proposed by UTS Energy/Teck Cominco in the vicinity of the Joslyn North Mine.

34. Attached as **Exhibit 9** is a print out of the pages entitled "Summary of environmental assessment - current projects" from the Government of Alberta's website <http://environment.alberta.ca/02313.html>. It indicates the final terms of reference for the Equinox and Frontier Mine were issued February 11, 2009.
35. The Alberta Environment Assessment website provided a link to the public disclosure document for these mines which is attached at **Appendix 10**. It indicates these mines were publicly disclosed in March 2008 and that:
- (a) The Frontier mine is located on Leases 311, 468, 470, 477, and 610, west of the Athabasca River in Townships 100 and 101, Range 11. Planned production is 100,000 to 160,000 barrels per day to commence between 2015 and 2017.
 - (b) The Equinox Mine is on the jointly owned Lease 14, west of the Athabasca River, directly across from the Fort Hills Project and 10 kilometres south of the Frontier Project in Township 98, Ranges 10 and 11. It is expected to produce 50,000 barrels of bitumen per day starting as early as 2014.
36. I believe that the Equinox Mine is located within the air, wildlife, vegetation, hydrology, soils regional study area for the project and the Frontier Mine is located within the air, hydrology and soils regional study areas. Attached as **Exhibit 11** is a copy of figure C.6.2-2 from the EIA with a hand drawn notation of the approximate location of the Equinox and Frontier mines.
37. Based on my review of the attached news release (**Exhibit 12**) dated July 07, 2010, Total will or has, acquired a 50% interest in the Equinox and Frontier mines.
38. I make this affidavit in support of a motion requesting the Panel to obtain the information necessary to conduct an environmental assessment of project taking into account the reasonably foreseeable future activities and projects which may cause significant adverse effects on the Environment when combined with the Total Joslyn North Mine and other existing and approved projects.

SWORN BEFORE ME at the Town of Rocky)
 Mountain House, in the Province of Alberta)
 this 20th day of September, 2010)
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<original signed by>
 A Commissioner for Oaths in and for
 the Province of Alberta

<original signed by>
SIMON DYER