

# Oil Sands Environmental Coalition

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17 November 2016

Alberta Energy Regulator  
Authorizations Review and Coordination Team  
Suite 1000, 250 – 5 Street SW  
Calgary, Alberta  
T2P 0R4  
E-mail: [ARCTeam@aer.ca](mailto:ARCTeam@aer.ca)

**Re: The Shell Canada Energy Muskeg River Mine Fluid Tailings Management Plan OSCA Application No. 1870302**

Dear Authorizations Review and Coordination Team:

I am writing you on behalf of the Oilsands Environmental Coalition (OSEC) regarding the proposed Shell Canada Energy (Shell) Tailings Management Plan (TMP) for the Muskeg River Mine (hereinafter the 'Modified Project'). The proposed modifications relate to tailings management of the existing Muskeg River Mine (hereinafter the "Existing Project"). Shell is the operator and majority shareholder of the Athabasca Oil Sands Project (AOSP), which consists of Shell oilsands mining and extraction operations, the Scotford Upgrader, and the Quest Carbon Capture and Storage project. Pursuant to Section 13 of the Oil Sands Conservation Act (OSCA), this letter is submitted as a Statement of Concern from OSEC regarding the Modified Project.

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute. Members of OSEC have a legal interest in recreational lease lands near the Settlement of Fort McKay, in close proximity (approximately 5 kilometers) west of the Modified Project operations. The interest consists of a license to occupy lands on the Muskeg and Athabasca Rivers for recreational purposes, such as camping, boating and fishing. Members of OSEC are concerned that Shell's Modified Project will adversely impact water quality and quantity, wildlife species and terrestrial values, and recreational opportunities available to OSEC members.

OSEC has longstanding concerns about the growing risks that oilsands tailings pose to the environment. We are concerned about the extent to which the Modified Project meets the stated intent and technical requirements of the recently issued *Lower Athabasca Region – Tailings Management Framework for the Mineable Oilsands* (TMF), which comprises a policy direction intended to "manage fluid tailings volumes during and after mine operation in order to manage and decrease liability and environmental risk resulting from the accumulation of fluid tailings on the landscape."<sup>1</sup> The Shell Muskeg River Mine (MRM) **OSCA Application No. 1870302** claims to comply with the *Tailings Directive 085: Fluid Tailings Management for Oil Sands Mining*

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<sup>1</sup> Government of Alberta. 2015. *Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF)*, p.1.

*Projects*,<sup>2</sup> which was developed under the *Oil Sands Conservation Act* (OSCA) and sets requirements for managing fluid tailings volumes for oilsands mining projects. We have several concerns regarding the sufficiency of this application in meeting the information requirements, fluid tailings management reporting, and surveillance and compliance processes stipulated by the Directive. In this regard, we have prepared a preliminary list of questions and concerns that we would like to bring to the attention of the Alberta Energy Regulator.

**1. Identify why you believe you may be directly and adversely affected by a decision of the AER on the application(s)**

All members of OSEC are directly and adversely affected by a decision of the AER on the application(s) cited herein. OSEC has an interest in lands near Fort McKay and in close proximity to the Modified Project. The interest consists of a license to occupy lands on and near the MacKay and Athabasca Rivers for recreational purposes, such as hiking, bird watching, camping, swimming and boating. Consequently all employees from Pembina and members of FMEA will be directly affected relative to their potential recreation activities on the recreation-leased lands.<sup>3</sup>

The mine and associated extraction facility are located on the west side of Lease 13 in between the Athabasca and Muskeg Rivers. The Modified Project is located about 70 kilometers north of Fort McMurray, Alberta. Given its close proximity to Fort McMurray and Fort Mackay, individual members of FMEA are directly and adversely affected by the Modified Project. As all members of OSEC have an interest in recreational lands near Fort McKay, they will be affected by environmental impacts in this region resulting from the Modified Project.

While emphasizing that it will first and foremost be directly and adversely affected by a decision of the AER on the Shell application, OSEC contends that it also meets the requirements for participation as a genuine interest intervener, as set out in the recent changes to intervener status procedures under the auspices of the AER's enhanced participation pilot program for Directive 085 Tailings Management Plan (TMP) applications. As such, **Appendix A** has been included to demonstrate OSEC's supplementary eligibility for genuine interest intervener status, in addition to its primary eligibility to participate as directly and adversely affected.

**2. Identify the nature of your objection to the application(s)**

Shell's TMP for the Modified Project is consistent and aligned with the Annual Mine Plan submitted to the AER in 2016 and the Mine Reclamation Plan submitted to the AER in 2015. Some changes were made to the MRM plan life of mine closure plan (LMCP) due to be submitted in December 2016, including: altered timing of tailings infilling to facilitate closure of the MRM External Tailings Facility (ETF); use of TT, CT, FFT drying, AFD, and centrifuge technology to manage long term FT inventories (instead of TT, AFD, CT, and NST as in

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<sup>2</sup> AER. 2016. *Directive 085: Fluid Tailings Management for Oilsands Mining Projects*.

<sup>3</sup> These lands are legally described as:

- a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;
- b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;
- c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and
- d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

previous MRM submissions); and, increased wetlands in the closure landscape due to larger volumes of TT deposits, as well as the generation of centrifuge deposits instead of NST.<sup>4</sup>

OSEC has concerns regarding the Modified Project's proposed fluid tailings profiles, reclamation criteria and timeline, fluid tailings treatment technologies, End Pit Lake design and water management, and proposed final reclamation landforms. Moreover, OSEC has concerns regarding AER procedures for ensuring industry-wide best practices in tailings management in alignment with Directive 085 and the TMF.

These concerns are described in more detail below.

### *I. Fluid Tailings Profiles*

OSEC is concerned about Shell's proposed fluid tailings profiles. The TMF stipulates in Section 5.2.1 the following guideline for 'Phase I – Early Production of Fluid Tailings Profiles':

It is expected that projects manage an inventory of fluid tailings is in the range of the volume that is expected to be produced during 3-10 years of full production, depending on site-specific circumstances.

However, Shell's profile predicts an accumulation of tailings from 2015-2024, wherein the inventory on-site in 2024 will be equivalent to 13 years of full production.<sup>5</sup> Based on these metrics, Shell's application does not meet the specified expectations of the TMF. Additionally, legacy tailings do not decrease over this period, with new tailings constituting just 5.5 years of the overall accumulation. This trajectory does not comply with the expectation delineated in Section 4.4 of Directive 085 that during design operation, growth of FT must closely match treatment rates. OSEC contends that this accumulation of fluid tailings is unreasonable, and that Shell should be treating FT at the same rate as it is producing FT sooner, particularly since MRM is an established mine that has been operating since 2002.

Furthermore, in Section 5.2.1 of the TMF a guideline is provided regarding fluid tailings volume profiles for "Phase II – Design Operation." This guideline states:

It is expected that growth of fluid tailings will closely match the rate of treatment so that, on average, fines can be managed to a treated state as they are produced.

As evident in Shell's profile, however, this will not occur for MRM until 2025, with inventories continuing to build in the 9 year interim. The peak volume of total FT for MRM is reached in

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<sup>4</sup> Shell Canada Energy (Shell). 2016. *Muskeg River Mine Fluid Tailings Management Plan: Approval No. 8512, as amended*. Submitted October 7, 2016 to the Alberta Energy Regulator.

<sup>5</sup> **OSEC calculations:**

Average Annual FT = 14.6Mm<sup>3</sup>/year

Peak Volume in 2024 = 186.3Mm<sup>3</sup>

$(186.3\text{Mm}^3)/(14.6\text{Mm}^3/\text{year}) = \underline{12.6 \text{ years}}$

**Formula used:**

*Average annual FT production = Average (Year X legacy FT – Year (x-1) legacy FT) + (Year X new FT – Year (x-1) new FT) – Year X RTR FT*

2024 at 186 Mm<sup>3</sup>. However, peak new FT is reached in 2054 at 127.8 Mm<sup>3</sup>, which constitutes roughly 9 years of new FT build-up at 14.6Mm<sup>3</sup> annually.<sup>4</sup> OSEC contends that these anticipated peak total and new FT volume date trajectories are too far into the future, and advocates for a more aggressive treatment trajectory if possible.

Finally, Requirement 8k in Section 4.4 of Directive 085 states that applications must contain tables showing predicted annual volumes of each FT pond and treated tailings deposits over the life of mine and 10 years after, including both legacy and new FT. While Shell generally meets this requirement in Appendix C, OSEC would like to inquire into the disappearance of 19.2 Mm<sup>3</sup> of FT from the "All FT" inventories in 2040 without this volume being accounted for as "Treated FT." An explanation for this apparent discrepancy would be appreciated.

## *II. Fluid Tailings Treatment Technologies*

Requirement 10 of Section 4.6 in Directive 085 stipulates that applications "justify that the technologies proposed are the best available for the project." In Appendix C of Shell's application, it is stated that volumes of FT will be treated using a Tailings Solvent Recovery Unit (TSRU), but the technology is not described within the text of the application. Furthermore, Section 3.2.3 states that the TSRU will be utilized to treat FT from Shell's Jackpine Mine (JPM) until 2107. However, TRSU is not a stand-alone treatment technology, and while Shell discusses potential centrifuges or alternate technologies, no specific plans are provided. Some more detailed clarification regarding the anticipated treatment plan(s) for JPM FT from 2058 to 2115 would accordingly be appreciated.

## *III. Proposed End Pit Lakes and Water Management*

Requirement 12 in Section 4.6 of Directive 085 states that where water-capped tailings technology is proposed, the application must identify an alternative technology. In Table 7.2 within its application Shell respectively discusses mitigation strategies for its two EPLs. However, OSEC contends that this discussion is not sufficiently comprehensive. In particular, Shell states in Table 7.2 that FT will "densify (fluid to solids) to meet dam de-licensing requirements." However, no details are provided regarding how this would work, proposed technologies, when it would occur, and where the materials would be placed. Additionally, OSEC asserts that the associated "implied perpetual maintenance" is not a viable option.

Moreover, Section 6.6 of the TMF states that applications that anticipate the return of process-affected water to the environment must include supporting analyses including the evaluation of potential ecosystem and human health risks. There are no such analyses included in Shell's application. This deficiency is a major concern for OSEC, particularly in light of the major existing provincial policy gap for water release from oilsands operations into the natural environment. OSEC is accordingly concerned about the implications of this planned open water management system on both the ecology of the Athabasca river and the livelihoods and recreational activities of local stakeholders.

OSEC asserts more broadly that the lack of water return policy remains a critical missing element in addressing tailings management at the industry level. In particular, OSEC is concerned by the absence of any existing guidelines or standards on naphthenic acids. As this issue is unique to the Alberta oilsands industry, it is OSEC's recommendation that the

Government of Alberta and the AER prioritize addressing it directly with an inclusive and concentrated policymaking working group prior to approving any Directive 085 applications (or, at minimum, including clear conditions *vis-à-vis* upcoming policy implementation for any approvals granted). Extensive consensus-building and consultation processes will ultimately be imperative to designing and implementing water return regulations for this industry.

#### *IV. Reclamation Criteria and Timelines*

In Section 4.7 of Directive 085, Requirement 13b stipulates that applications identify and justify proposed performance indicators for each deposit. Correspondingly, Table 5.2 in Shell's application shows a timeline to reach the RTR and RFR criterion. However, Shell states a high degree of uncertainty regarding whether these criteria are appropriate or accurate, and assumes that it will be possible to "revise criteria as more data becomes available." OSEC is concerned about this stated lack of confidence that treated FT will efficaciously be on a trajectory for RFR.

Moreover, OSEC is concerned that Shell's TMP does not meet Requirement 13e in Section 4.7 of Directive 085, which requires that the application contain a justification of how proposed performance indicators and criteria align with targeted landforms. Shell states in Section 5.3.2 that "due to centrifuge deposits being expected (the base technology was NST in previous plans), the distribution of end land use may have more localized wetlands and potentially some open water compared to previous closure submissions." As such, OSEC is concerned that the performance of these deposits will dictate the final landform as opposed to the converse, as stipulated by the aforementioned Requirement 13e. Some clarification regarding this apparent discrepancy would be appreciated.

Finally, Requirement 13a in Section 4.7 of Directive 085 requires that applications contain a map of the location and size of treated tailings deposits and fluid tailings ponds, both existing and proposed, including final landforms and targeted ranges of ecosites. Shell's application correspondingly includes figures in Appendix D delineating these components of the site. However, there appears to be some discrepancy between Figure D-9 and Figure 7-1 regarding the location for the EPLs. Subsequently, it is difficult to understand how much FT will be captured in these EPLs. Section 4.4.2 explains one of the EPLs will be located in cell 1, but it is unclear which DDA will form the second EPL. Some clarification would be greatly appreciated.

#### *V. Ensuring Best Practices in Tailings Management*

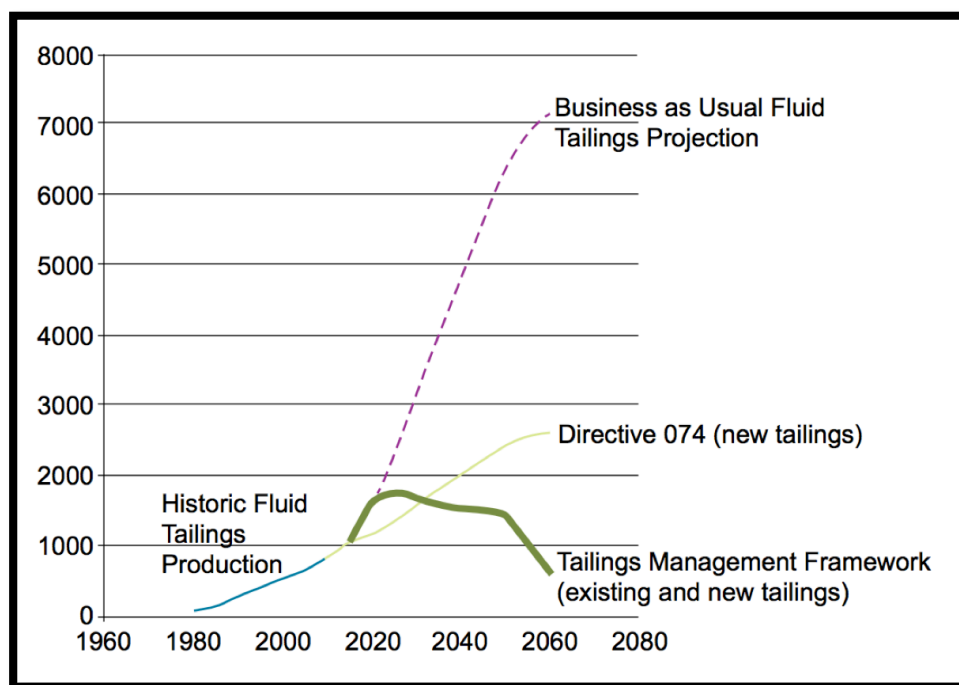
OSEC is interested in ensuring that all companies are using best practices in addressing tailings management and that operators will be held to similar standards. Notably, Pembina is currently conducting a cumulative industry-wide analysis of all Directive 085 applications. The results of this analysis to date has demonstrated that cumulative tailings inventories are not consistent with the expectations presented in the TMF. OSEC correspondingly continues to seek clarification regarding how the AER will consolidate and critically analyze all proponents' trajectories, and delineate which projects are underperforming at the expense of industry-wide expectations.

The TMF graphically outlines the expected cumulative trajectory of all fluid tailings on the landscape including a peak date for tailings accumulation, a rate of decline, and the point at which tailings cumulative tailings volumes will actually decline (**Figure 1**). OSEC has amalgamated the projected tailings volumes from all Directive 085 applications submitted to

date, and compared it with the aforementioned TMF trajectory (**Figure 2**). This analysis has demonstrated a general trend wherein cumulative tailings volumes are peaking roughly ten years later than the TMF anticipated. This analysis is currently being expanded to include the projected fluid tailings volumes of all Alberta oilsands mines, as submitted for the November 1, 2016 deadline.

OSEC and the AER's ability to determine the adequacy of Shell's plans are correspondingly dependent on an assessment that the sum of the approved tailings plans are consistent with the TMF's objectives. As such, it is essential for regulators and stakeholders to be able to compare all tailings plans in conjunction to ensure responsible regulatory decisions are made. We thereby strongly recommend that no applications be approved until all proponent plans have been submitted and reviewed.

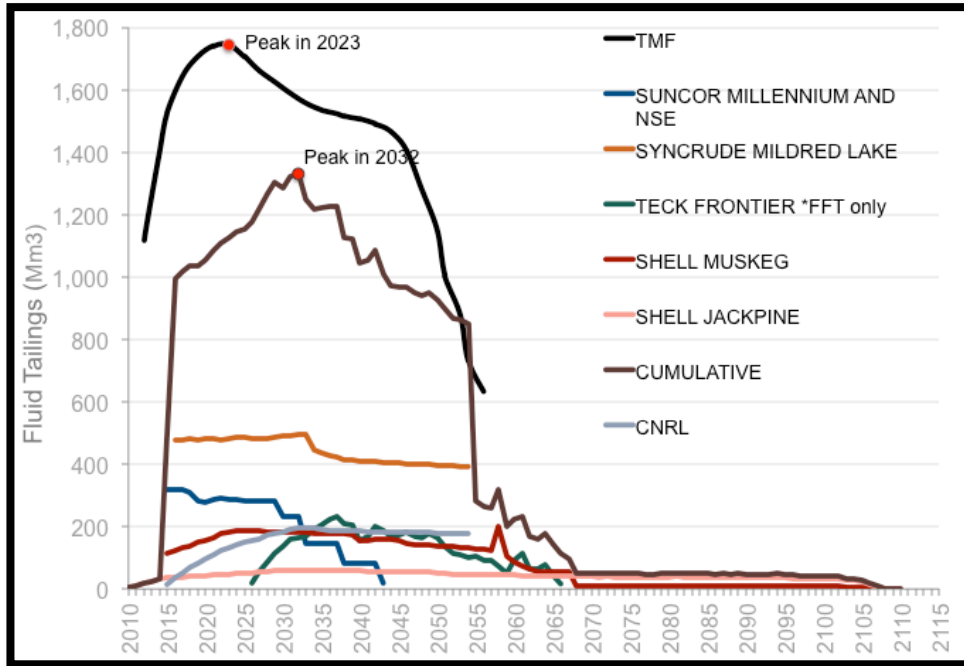
**Figure 1:** Expected Cumulative Tailings Under the TMF<sup>6</sup>



<sup>6</sup> Government of Alberta. 2015. *Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF)*, p.18.



**Figure 2:** Cumulative Tailings Volumes of All Directive 085 Applications Analyzed to Date



*(Original Figure)*

### 3. Identify the outcome of the application you advocate

At this time, OSEC submits that Shell's TMP application for Directive 085 is incomplete. OSEC correspondingly requests that Shell provide the aforementioned additional evidence to increase confidence regarding the Modified Projects' compliance with the TMF. In order to fulfill its mandate to ensure safe, efficient and responsible development of Alberta's natural resources, the Alberta Energy Regulator should request additional information from the proponent before proceeding to a hearing. OSEC wishes to work with Shell and the AER to comprehensively address the deficiencies and impacts outlined above and review the cumulative tailings trajectory expected from approval of this and other applications. We advocate that any regulatory approvals granted by the AER should be consistent with the objectives of the TMF to halt the growth of cumulative fluid tailings (FT) volumes as soon as technically possible and then to require companies to steadily reduce volumes while accelerating the rate of reclamation. The analyses Pembina has conducted to date, conversely, indicate that cumulative FT volumes will continue to grow for the next 25 years. Pembina advocates that the AER ensure that project approvals are, in aggregate, consistent with the peak year and trajectory of tailings volume identified in the Tailings Management Framework.

OSEC would like to commend Shell for their proactive and inclusive engagement of genuine-interest stakeholders to date in clarifying various quantitative and qualitative elements of their application, and exploring associated impacts and alternatives. The detailed insights Shell provided through bilateral consultation regarding Pembina's initial concerns with this application were very helpful in informing and evolving Pembina's perspectives and technical capacity on this file. Engagement between OSEC and Shell to date has been constructive, and OSEC looks forward to further bilateral and multilateral cooperation.

**4. Identify the location of your land, residence, or activity in relation to the location of the energy resource that is the subject of the proposed application; and your contact information including your name, address in Alberta, telephone number, e-mail address or, if you do not have an email address, your fax number.**

The Pembina Institute and the Fort McMurray Environmental Association have signed an agreement with Fort McKay Metis Local #63. The lands in the agreement are partially adjacent to the McKay River and are legally described as:

- a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;
- b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;
- c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and
- d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

The contract lands are approximately 50 kilometers upstream from the Modified Project. The recreational agreement provides that OSEC members may access the contract lands to recreate (i.e hiking, camping, swimming) providing one week's prior notice is offered to Fort McKay Metis #63.

The Oilsands Environmental Coalition (OSEC) is an unincorporated coalition of Alberta public interest groups and individuals with a long-standing interest in the Athabasca Oilsands area. OSEC was formed to facilitate more efficient participation in the regulatory approvals processes for oilsands applications. Its current members include the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Fort McMurray Environmental Association (FMEA)  
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Fort McMurray, Alberta  
T9H 4X8  
Attention: Ann Dort-MacLean  
[girlsinc@telus.net](mailto:girlsinc@telus.net)

FMEA consists of residents living in and around Fort McMurray who are concerned about the effects of oilsands development on human health, the ecosystem and the socio-economic quality of life in the municipality of Wood Buffalo. As of 2012, FMEA had 37 members.

The Pembina Institute  
219 19 Street NW  
Calgary, AB  
T2N 2H9

The Pembina Institute is a non-profit environmental research organization founded in Alberta in 1985. One of its objectives is to minimize the environmental impacts associated with fossil fuel development in Alberta. It has monitored the health and environmental implications of oilsands development since the mid-1980's and has been particularly active in the assessment and management of long term, chronic, and cumulative impacts.



*Conclusion*

This Statement of Concern should be considered preliminary rather than final and conclusive. OSEC retains the right, upon further analysis of the project proponent's regulatory filings, to bring new issues to bear in a regulatory setting. OSEC is interested in working with Shell to attempt to resolve these important issues and we seek a formal ADR process and forum to support this assessment.

Sincerely,



Jodi McNeill  
Analyst, Responsible Fossil Fuels  
Pembina Institute  
On behalf of the Oil Sands Environmental Coalition

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## Appendix A

OSEC should be permitted to participate in the process because it is directly and adversely affected by the application, as set out in the preceding Statement of Concern. In the alternative, OSEC should be permitted to participate because it also meets the requirements for participation as a genuine interest intervener, as set out herein.

The following three sub-sections provide an overview of how OSEC meets the requirements of participation as a genuine interest intervener, in addition to being directly and adversely affected.

**1) Provide a concise explanation of how your participation will materially assist the AER in making a decision on the application (e.g., you can provide project-specific, detailed technical information).**

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Since the Public Notice of Application in mid October, OSEC has been actively reviewing the proposed Shell tailings management plan. The Pembina Institute's review of the Modified Project have included both detailed technical analyses of the proposed TMP and comparative analyses from an industry-wide tailings management perspective. The products of both analyses are expected to contribute meaningfully in assisting the AER's decision making process for this application. The preceding Statement of Concern provides an overview of the nature of OSEC's research, analysis, and perspectives on this file.

**2) Provide a concise explanation of how you have a tangible interest in the subject matter of the review (e.g., you participate on committees or are involved in other activities related to oil sands tailings).**

For over 30 years members of OSEC have demonstrated a genuine interest in promoting sustainable development in Northern Alberta, overseeing responsible oilsands exploration and development, and managing the cumulative environmental impacts of oilsands mining.

In particular, the Pembina Institute's experience in researching and reporting on Alberta oilsands tailings includes: five major technical research publications on tailings management from 2008-2013; leadership in designing and facilitating multi-stakeholder initiatives intended to manage cumulative impacts of tailings; participation in numerous government consultation processes, including processes specific to tailings; membership in the AER's 2015-16 Technical Advisory Committee for Tailings Regulatory Management; and participation in the 2016 Water Management Working Group hosted by the Government of Alberta.

**3) Provide a concise explanation of how your participation will not unnecessarily delay the review.**

OSEC has earned a reputation for providing substantive and well-researched perspectives that add value to regulatory processes. Members of OSEC are routinely contacted by media, industry,

and governments both in Canada and abroad for comments and insights that are highly credible, well-researched, and fair.

The principle objective of OSEC for participating in the review of this application is to ensure that concerns are addressed in the most comprehensive and efficient manner possible. Correspondingly, OSEC is currently in bilateral discussions with the AER to promote the adoption of ADR processes and forums at an industry-wide level, in order to prevent unnecessary interferences with the regulator's concurrent review of all D085 applications.