Environmental Assessment – Joint Review Panel

IN THE MATTER OF

FRONTIER OIL SANDS PROJECT

Teck Resources Limited

FINAL ARGUMENT ON GREENHOUSE GAS EMISSIONS ASSOCIATED WITH THE FRONTIER OIL SANDS PROJECT

Filed by:

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PART I. INTRODUCTION

The Canadian Parks and Wilderness Society is a nationwide charity dedicated to the protection of Canada's public land and water, and ensuring that parks are managed to protect the nature within them. CPAWS Northern Alberta has championed the protection of Alberta's diverse natural heritage since its establishment in 1968 as the first regional chapter.

These are the final arguments of CPAWS Northern Alberta ("CPAWS") to the Joint Review Panel ("JRP") in relation to the greenhouse gas ("GHG") emissions associated with the Frontier Oils Sands Project (the "Project"). Separately by oral submissions, CPAWS will also be providing evidence and submissions on the Project's potential impacts on the Wood Buffalo National Park.

Based on the submissions that follow, CPAWS submits that this Project, if approved, would significantly hinder Canada's ability to meet its GHG reduction targets, and thereby significantly hinder Canada's transition to a sustainable economy. Further, CPAWS submits that this Project, both from its annual GHG emissions and its total cumulative GHG emissions, is likely to cause significant adverse environmental effects.

In support of these submissions, CPAWS has adduced the following evidence:

1. Expert opinion of Dr. Simon Donner dated August 15, 2018;[1]
2. Expert opinion of Dr. Kirsten Zickfeld dated August 23, 2018;[2]
3. A special report by the United Nations Intergovernmental Panel on Climate Change ("IPCC") regarding global warming of 1.5°C released October 8, 2018 ("1.5°C Special Report"), for which Dr. Zickfeld was a Lead Author;[3] and,
4. The IPCC's companion report to the 1.5°C Special Report entitled *Summary for Policymakers* released October 8, 2018.[4]

Dr. Donner is a climate scientist and Professor in the Geography Department at the University of British Columbia.[5] He served as a Contributing Author to the IPCC's *Fifth Assessment Report*, and will serve as a Lead Author of the *Sixth Assessment Report*.[6] Dr. Kirsten Zickfeld is a climate scientist and Associate Professor in the Geography Department at Simon Fraser University.[7] She served as Lead Author for both the *IPCC Special Report on Global Warming of 1.5°C* and the *Sixth Assessment Report*.[8] Further elaborations on their expertise and qualifications can be found

[1] Expert Opinion #1 of Dr. Simon Donner, dated August 15, 2018, Doc. #487 ("Donner Opinion").
[2] Expert Opinion #1 of Dr. Kirsten Zickfeld, dated August 23, 2018, Doc. #487 ("Zickfeld Opinion").
[3] United Nations Intergovernmental Panel on Climate Change ("IPCC"), *Global Warming of 1.5°C: an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* (8 October 2018), Doc. 654 ("1.5°C Special Report").
[4] IPCC, *Global Warming of 1.5°C: an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty – Summary for policymakers* (8 October 2018), Doc. 654 ("1.5°C Policymaker's Summary").
[5] Donner Opinion, *supra* note 1 at para. 3.
[6] *Ibid*.
[7] Zickfeld Opinion, *supra* note 2 at para. 3.
[8] *Ibid*.

in CPAWS' submissions filed in conjunction with their expert reports, and in their expert reports themselves.[9]

Dr. Donner's expert opinion focuses on the compatibility of GHG emissions from Canada's oil sands sector with Canada's federal climate change and greenhouse gas reduction commitments. Dr. Zickfeld provides an overview of the science of climate change and analyzes the impact of GHG emissions associated with this Project using a carbon budget approach.

In Part II, we review the legal framework relevant to the review of this Project, including the legal duties that the JRP must discharge in this review. In Part III, we provide an overview of the scientific evidence relating to climate change and to the Project's GHG emissions. Applying the evidence adduced at this hearing to the applicable legal principles, we provide an assessment of the Project's GHG impacts in Part IV.

PART II. LEGAL FRAMEWORK

In this Part, we review the legal framework applicable to the JRP's review of this Project, and the legal duties that the JRP must discharge in this review.

A. The *CEAA, 2012*

This JRP is a review panel under the *CEAA, 2012*.[10] The *CEAA, 2012* governs the process of this environmental assessment and delineates the legal duties that the JRP is required to discharge.[11]

The *CEAA, 2012* sets out the mandatory factors that the JRP must take into account when conducting the environmental assessment under s. 19(1) of the Act. Among other things, the JRP must take into account "the environmental effects of the designated project" including "any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out".[12]

In carrying out its statutory mandate under the *CEAA, 2012*, the JRP must also interpret the statute consistently with the Act's stated purposes, which includes "to encourage federal authorities to take actions that promote sustainable development in order to achieve or maintain a healthy environment and a healthy economy".[13] The *CEAA, 2012* defines "sustainable development" as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs."[14] We submit that the JRP should interpret "sustainable development" in a manner requiring the proponent to demonstrate that the Project provides a net contribution to sustainability within the context of Canada's climate change commitments: see Section C below in this Part.

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[9] CPAWS, *Submissions on Greenhouse Gas Emissions Associated with the Frontier Oil Sands Project* (31 August 2018), Doc. #487.
[10] *Canadian Environmental Assessment Act, 2012*, S.C. 2012, c. 19, s. 52 ("*CEAA, 2012*"), ss. 38 & 126.
[11] While this JRP is also conducting a review under various Alberta statutes, we focus on the federal legislation in these submissions.
[12] *CEAA, 2012*, *supra* note 10, s. 19(1)(a).
[13] *Ibid.*, s. 4(1)(h).
[14] *Ibid.*, s. 2(1).

Furthermore, the Act requires that "[the JRP], in the administration of this Act, must exercise their powers in a manner that protects the environment and human health and applies the precautionary principle." [15] With respect to the connection between sustainable development and the precautionary principle, the Supreme Court of Canada has adopted the definition from the *Bergen Ministerial Declaration on Sustainable Development* (1990):

> In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.[16]

The precautionary principle is recognized and affirmed in a number of Canadian statutes in addition to the *CEAA, 2012*. These include the *Species at Risk Act*[17], the *Oceans Act*[18], the *Canadian Environmental Protection Act*[19], the *Pest Control Products Act*[20], and the proposed amendments to the *Fisheries Act*.[21] Indeed, there is a growing body of jurisprudence – including numerous Federal Court and the Supreme Court of Canada decisions – that applies the precautionary principle in the interpretation of statutory provisions, particularly where the precautionary principle has been explicitly referred to in the statute itself, as here in the *CEAA, 2012*.[22]

Notable among these is a recent decision of the Federal Court in *Taseko Mines*.[23] In this case, the Court upheld a decision of the *CEAA, 2012* review panel to apply the precautionary principle in reaching the conclusion that the project under review was likely to cause significant adverse environmental effects. Moreover, the Court rejected the proponent's argument that the review panel should have eschewed the precautionary principle in favour of one based on adaptive management. According to the Court, when faced with the choice between assessing project-related risks using a precautionary as opposed to an adaptive management approach, the Panel correctly erred on the side of precaution. In the Court's words:

> Indeed, acceptance of vague adaptive management schemes in circumstances such as these would, in my view, tend to call into question the value of the entire review panel process –

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[15] *Ibid.*, s. 2(2).
[16] *114957 Canada Ltée (Spray-Tech, Société d'arrosage) v. Hudson (Ville)*, 2001 SCC 40 at para. 31.
[17] *Species at Risk Act*, S.C. 2002, c. 29, preamble & s. 38.
[18] *Oceans Act*, S.C. 1996, c. 31, preamble.
[19] *Canadian Environmental Protection Act*, S.C. 1999, c. 33, preamble and ss. 2(1)(a) & 76.1.
[20] *Pest Control Products Act*, S.C. 2002, c. 28, ss. 20(1) & (2).
[21] Bill C-68, *An Act to amend the Fisheries Act and other Acts in consequence*, 1st Sess., 42nd Parl., 2015, cl. 2, s. 2.5 (as passed by the Senate in First Reading 20 June 2018).
[22] See *e.g.*, *Spray-Tech*, *supra* note 16; *Castonguay Blasting Ltd. v Ontario (Environment)*, 2013 SCC 52; *Taseko Mines v. Canada*, 2017 FC 1099; *Morton v. Minister of Fisheries and Oceans*, 2015 FC 575; *Environmental Defence Canada v. Canada (Fisheries and Oceans)*, 2009 FC 878; *Wier v. British Columbia (Environmental Appeal Board)*, 2003 BCSC 1441.
[23] *Taseko Mines*, *ibid.* at para. 120.

> if all such decisions could be left to a later stage, then the review panel process would simply be for the sake of appearances.[24]

In the present review, the JRP must be equally cautious in accepting vague adaptive management or mitigation measures that Teck proposes as a way to mitigate GHG-related impacts.

Finally, as a review panel, the JRP must prepare a report that sets out "the review panel's rationale, conclusions and recommendations".[25] The Minister of Environment, after taking into account the JRP's report, is required to determine if this Project is likely to cause significant adverse environmental effects.[26] If the Minister finds that this Project is likely to cause significant adverse environmental effects, the Governor in Council must determine whether such effects are nonetheless "justified in the circumstances".[27]

Within the context of this Project, therefore, the environment assessment is a two-step process. The first step consists of an assessment of all potential project-related adverse environmental effects by the JRP. Based on the assessment completed in step one, the next step involves decision-making by the Minister and the Governor in Council. One of the key functions of the *CEAA, 2012* is to ensure that the review panel (here the JRP) provides the ultimate decision-maker with an evidentiary basis adequate to decide whether the Project should proceed.

Consistent with the two-step process of an environmental assessment, the Federal Court in *Cardinal River* set out three duties that a review panel must discharge in order to ensure the ultimate decision-maker has information adequate to decide whether or not to approve or not approve a project: 1) gather all the information required for an assessment, 2) conduct an environmental assessment that considers the list of factors under what is now s. 19(1) of the *CEAA, 2012*, and 3) prepare a report that includes the rationale, conclusions, and recommendations of the panel.[28]

These three duties reflect the fact that the role of the responsible authority (here the JRP) in an environmental assessment extends beyond simply answering the question of whether a designated project is likely to cause significant adverse environmental effects. As Professor Meinhard Doelle states, environmental assessment "is about more than a consideration of biophysical environment, what is expected is that the EA process will result in integrated decision-making, considering environmental, social and economic consequences of projects".[29] As he explains, the responsible authority serves two important functions for those who must ultimately decide the fate of the project:

> One is to help with the determination of whether the project is likely to cause significant adverse environmental effects. The other is to more generally help federal decision-makers

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[24] *Ibid.* at para. 124.
[25] *CEAA, 2012*, *supra* note 10, s. 43(1)(d)(i).
[26] *Ibid.*, ss. 47 & 52(1).
[27] *Ibid.*, s. 52(4).
[28] *Alberta Wilderness Assn. v. Cardinal River Coals Ltd.* (1999), [1999] 3 F.C. 425 at para. 18, 1999 CarswellNat 2487 ("*Cardinal River*"). See also *Pembina Institute for Appropriate Development v. Canada (Attorney General)*, 2008 FC 302 ("*Pembina*"), and *Grand Riverkeeper, Labrador Inc. v. Canada (Attorney General), 2012 FC 1520*.
[29] Doelle, M., *The Federal Environmental Assessment Process: A Guide and Critique* (Markham, Ontario: LexisNexis, 2008) at 137-138.

> decide whether to exercise their discretion to make a decision that allows the project to proceed… taking account of the full range of environmental, social and economic factors.[30]

The importance of a responsible authority discharging its legal duty to provide a proper and adequate EA report to the ultimate decision-maker was highlighted in the recent Federal Court of Appeal decision in *Tsleil-Waututh Nation*.[31] In this judicial review of the EA conducted by the National Energy Board ("NEB"), the Court quashed the Order in Council approving the Trans Mountain Expansion Project because, among other things, the NEB had failed to conduct a proper assessment of project-related marine transportation under the *CEAA, 2012*. The Court found that this deficiency arose because, due to a series of errors, the NEB failed to provide the Governor in Council with a legally adequate "report" on which the Governor in Council could make its legal determinations under the *CEAA, 2012*.

Therefore, in order for the JRP to conduct a legally adequate environmental assessment and to provide a legally adequate report to the Minister, the JRP must do more than simply provide its findings as to whether this Project is likely to cause significant adverse environmental effects. It must also discharge its duty to gather the information necessary for the Minister and Governor in Council to discharge their respective decision-making powers in relation to this Project.

B. Canada's Climate Change Commitments

Canada is a signatory state to the *Paris Agreement*.[32] The *Paris Agreement* builds upon the United Nations Framework Convention on Climate Change ("UNFCCC") and is an international treaty that elaborates various measures to combat climate change.

The central provision of the *Paris Agreement* is a commitment by the parties to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.[33]

Under the *Paris Agreement*, each party is required to submit Nationally Determined Contributions ("NDCs"), which outline the party's intended efforts to achieve the objectives of the *Paris Agreement*.[34] Moreover, each party is required to submit long-term low greenhouse gas emission development strategies.[35] Canada has submitted its NDC, in which Canada commits to reduce its GHG emissions by 30% below 2005 levels by 2030.[36] Moreover, pursuant to its commitment to develop long-term strategies to meet its international obligations, Canada has submitted its mid-

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[30] *Ibid*. at 140.
[31] *Tsleil-Waututh Nation v. Canada (Attorney General)*, 2018 FCA 153.
[32] *Paris Agreement*: https://unfccc.int/sites/default/files/english_paris_agreement.pdf. The *Paris Agreement* entered into force 12 December 2015: https://treaties.un.org/doc/Publication/CN/2016/CN.735.2016-Eng.pdf.
[33] *Ibid.*, Article 2, para. 1(a).
[34] *Ibid.*, Article 4, para. 2.
[35] *Ibid.*, Article 4, para. 19.
[36] Canada's First NDC (revised), 2017: http://www4.unfccc.int/ndcregistry/PublishedDocuments/Canada%20First/Canada%20First%20NDC-Revised%20submission%202017-05-11.pdf.

century strategy.[37] Under this strategy, Canada aims to reduce GHG emissions by 80% below 2005 levels by 2050.[38]

C. Significance of GHG Effects, Sustainability, and Climate Change Commitments

Integrating climate change considerations into project-level environmental assessments, while not new, continues to face many challenges.[39] Traditional methods of environmental assessment often fail at addressing climate change due to three pertinent characteristics of climate change. First, climate change is a global phenomenon that is not easily assessed at the project level. Second, climate change is a cumulative-effects problem stemming from the accumulation of GHG from multiple sources. Third, climate change is an intergenerational problem because actions that cause climate change today are felt by future generations yet to come. In assessing this Project's potential climate change implications, the JRP must be attentive to and address these challenges.

In gathering the pertinent information and assessing the significance of environmental effects associated with the Project's GHG emissions, CPAWS submits that the JRP should be guided by, among other things, two key considerations:

1. this Project's contribution to sustainability; and,
2. this Project's impact on Canada's ability to meet its climate change commitments under the *Paris Agreement*.

While the Project's contribution to sustainability and the Project's impact on Canada's climate change commitments are not synonymous, we submit that, in the context of considering the significance of impacts from GHG emissions, there is substantial overlap between the two concepts.

The federal Expert Panel for the Review of Environmental Assessment Processes, in their report published in 2017, recommended a sustainability approach to project reviews.[40] Bill C-69, currently undergoing second reading in the Senate, would replace the *CEAA, 2012* with an *Impact Assessment Act*, in which "the extent to which the designated project contributes to sustainability" would be a key factor in determining project approval.[41]

CPAWS submits that the JRP should consider whether this Project, in light of its GHG emissions, provides a net-positive contribution to sustainability for Canada. Due to the global, cumulative, and intergenerational nature of climate change, the current assessment should therefore focus on the Project's implications on Canada's GHG reduction commitments, both internationally and

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[37] *Canada's Mid-Century Long-term Low-Greenhouse Gas Development Strategy* (2016): http://publications.gc.ca/collections/collection_2017/eccc/En4-291-2016-eng.pdf.
[38] *Ibid.*
[39] See Meinhard Doelle, "Integrating Climate Change into EA: Thoughts on Federal Law Reform" (2016) online: https://ssrn.com/abstract=2854522, at p.1.
[40] Expert Panel for the Review of Environmental Assessment Processes, *Building Common Ground: A New Vision for Impact Assessment in Canada* (2017): https://www.canada.ca/content/dam/themes/environment/conservation/environmental-reviews/building-common-ground/building-common-ground.pdf.
[41] Bill C-69, *An Act to enact the Impact Assessment Act and the Canadian Energy Regulator Act, to amend the Navigation Protection Act and to make consequential amendments to other Acts*, 1st Sess., 42nd Parl., 2015, cl. 1, s. 63(a) (as passed by the Senate in First Reading 20 June 2018).

domestically, and on Canada's timely transition to a carbon-neutral economy for both present and future generations. Moreover, and importantly, the current assessment should not only assess the annual GHG emission rates from this Project, but also the total cumulative GHG emissions from this Project over its entire lifetime, and how the total cumulative GHG emissions from this Project would impact Canada's ability to meet its climate commitments.

It is, of course, difficult if not impossible to link the GHG emissions from any particular project to global climate impacts. Nonetheless, we submit that the gravity and urgency of climate change means that the JRP cannot use this as a reason for failing to assess the significance of project-related GHG emissions. In the circumstances, therefore, the JRP should adopt a precautionary approach. As discussed above, the Supreme Court of Canada has noted that, in order for sustainable development to be achieved, policies must be based on the precautionary principle. The serious and irreversible harm posed by climate change engages the precautionary principle and heavily weighs in favour of requiring the proponent to show in this case how the Project is consistent with efforts needed by Canada to reduce GHG emissions significantly in order to avoid catastrophic climate change.

Lastly, the JRP must be mindful of the bifurcated responsibility between it, on the one hand, and the ultimate decision-makers, on the other. The Minister and the Governor in Council are vested with the ultimate responsibility to determine whether this Project should be approved under the *CEAA, 2012* assessment process. The JRP is legally required to provide a sufficient evidentiary basis for the Minister and Governor in Council to make this decision. CPAWS submits that the JRP must provide a robust analysis of this Project's climate change impacts from GHG emissions so that the Minister and Governor in Council has the information necessary to make a final determination. In our view, a robust GHG analysis should include, among other things, an assessment of the Project's total cumulative GHG emissions and their impact on Canada's domestic and international GHG reduction targets.

PART III. EVIDENCE ON CLIMATE CHANGE & PROJECT'S GHG EMISSIONS

A. GHG and Climate Change

On October 8, 2018, the IPCC released a special report on the impacts of global warming of 1.5°C above pre-industrial levels, and efforts that the international community must make in order to advert such warming. Under the *Paris Agreement*, parties commit to an aspirational goal of limiting the increase in global temperatures within 1.5°C. The report presents a sobering picture of the state of the climate change impacts and an urgency with which we must act to avoid run-away climate impacts. As noted above, Dr. Zickfeld is one of the lead authors of this report.

According to the IPCC, there is a high confidence that human activities have caused approximately 0.8°C to 1.2°C of global warming from pre-industrial levels, and that global warming is likely to reach 1.5°C between 2030 and 2052 if the current trend continues.[42] Anthropogenic emissions since pre-industrial times to the present already in the atmosphere will continue to cause warming and long-term impacts for centuries to millennia.[43]

[42] 1.5°C Policymaker's Summary, *supra* note 4 at 4.
[43] *Ibid.*

The report compiles the latest scientific information and predicts adverse impacts on human and environmental systems due to global warming of more than 1.5°C above pre-industrial levels. For example, extreme weather conditions such as heavy precipitation or drought, global mean sea level rise, adverse impacts on biodiversity and ecosystems, and climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are all predicted to be more serious and intense.[44]

Perhaps the most crucial information in the report is the IPCC's conclusions regarding emissions pathways. In order to avoid global warming of more than 1.5°C, carbon dioxide emissions in particular must decline by about 45% below 2010 levels by 2030, and reach net zero around 2050.[45] This means that the global community must achieve sharp emissions reductions within the next decade, and that by 2050 carbon dioxide emissions must be balanced globally by carbon dioxide removal technology. The IPCC recognizes that achieving the goal of limiting global warming to 1.5°C requires "rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems."[46] This transition would have to be "unprecedented" in scale and would require "deep emissions reductions" across all sectors.[47]

So far, the global community has not stepped up to the task. According to the IPCC report, the NDCs that parties have submitted under the *Paris Agreement* would not be sufficient to avoid global warming of 1.5°C. In fact, based on the current NDCs, the world is heading towards warming of 3°C by 2100.

B. The Project and GHG Emissions

Teck Resources Limited ("Teck") proposes to construct, operate, and reclaim an oil sands surface mine in northeastern Alberta. According to Teck, the Project will have a nominal capacity of 260 thousand barrels per calendar day ("bbl/cd") of partially deasphalted bitumen from a two-phase surface mining development.[48]

Teck divides the Project's GHG sources into three: 1) pre-operation (construction and site preparation), 2) operations, and 3) decommissioning. Teck reports the amount of CO_2 and CO_2 equivalents ("CO_2e") that the Project is expected to release into the atmosphere for each of these three sources:[49]

[44] *Ibid.* at 8-12.
[45] *Ibid.* at 15.
[46] *Ibid.* at 21.
[47] *Ibid.*
[48] Project Update Vol. 1, Section 1, page 1-2.
[49] Aside from CO_2, other types of greenhouse gases such as methane, nitrous oxide, and halocarbons also cause global warming: Zickfeld Opinion, *supra* note 2 at para. 6. "Equivalent CO_2 emissions are defined as the amount of CO_2 that would cause the same integrated radiative forcing, over a given time horizon, as an emitted amount of a well-mixed GHG or a mixture of well-mixed GHGs. The equivalent CO_2 emission is obtained by multiplying the emission of a GHG by its Global Warming Potential for the given time horizon, usually taken to be 100 years": *Ibid.* at footnote 6.

1. **Pre-operation:** Over the course of construction and site-preparation, the Project is expected to emit a total of 257.4 kilotonnes ("kt") of CO_2e and 608.3 $ktCO_2e$, respectively.[50] Of these, CO_2 emissions alone would be 241.8 $ktCO_2$ for construction and 543.2 $ktCO_2$ for site-preparation.[51]
2. **Operations:**
   a. ***Direct emissions*:** Over the course of the Project's 39-year operational lifetime, Teck estimates that the Project will directly emit a total of 151,281.00 $ktCO_2e$.[52] Of these, CO_2 emissions alone would be 134,492.28 $ktCO_2$.[53]
   b. ***Indirect emissions*:** Indirect GHG emissions associated with this Project over its 39-year operational lifetime amounts to 7,900.43 $ktCO_2e$, of which CO_2 emissions alone would be 7,821.42 $ktCO_2$.[54]
3. **Decommissioning:** Over the course of decommissioning, the Project is expected to emit a total of 340.2 $ktCO_2e$, of which CO_2 emissions alone would be 304.5 $ktCO_2$.[55]

Based on these numbers, total GHG emissions associated with this Project amount to 160.39 megatonnes ("Mt") of CO_2e, of which CO_2 emissions alone would be 143.4 $MtCO_2$. These numbers are summarized in Table 1 below.

Table 1: Cumulative GHG Emissions Associated with the Project

Emissions Source	**GHG emissions**	**CO_2 emissions alone**
Construction	257.40 $ktCO_2e$	241.80 $ktCO_2$
Site-preparation	608.30 $ktCO_2e$	543.20 $ktCO_2$
Operation (direct)	151,281.00 $ktCO_2e$	134,492.28 $ktCO_2$
Operation (indirect)	7,900.43 $ktCO_2e$	7,821.42 $ktCO_2$
Decommissioning	340.20 $ktCO_2e$	304.50 $ktCO_2$
Total in kt	**160,387.33 $ktCO_2e$**	**143,403.20 $ktCO_2$**
Total in Mt	***160.39 $MtCO_2e$***	***143.40 $MtCO_2$***

In terms of emission rates during the operations of the Project, the Project is expected to directly emit 3,879.00 $ktCO_2e$/yr, of which CO_2 alone would be 3,448.52 $ktCO_2$/yr.[56] Indirect emissions would add a further 202.58 $ktCO_2e$/yr, of which CO_2 alone would be 200.55 $ktCO_2$/yr.[57] Therefore, the total operational emission rates are 4,081.58 $ktCO_2e$/yr and 3,649.07 $ktCO_2$/yr, or about 4.1 $MtCO_2e$/yr and 3.6 $MtCO_2$/yr.[58] For context, according to Dr. Donner, Canada's oil sands sector emits about 72-100 $MtCO_2e$/yr.[59] These figures are summarized in Table 2 below.

[50] Project Update Vol. 3, Section 4, Table 4-104 & Table 4-105.
[51] *Ibid.*
[52] Project Update Vol. 3, Section 4, Table 4-106.
[53] Zickfeld Opinion, *supra* note 2 at paras. 11-12 & Table 1.
[54] *Ibid.*
[55] Project Update Vol. 3, Section 4, Table 4-108.
[56] Zickfeld Opinion, *supra* note 2 at paras. 11-12 & Table 1.
[57] *Ibid.*
[58] *Ibid.*
[59] Donner Opinion, *supra* note 1 at para. 5.

Table 2: Annual GHG Emission Rates Associated with Project Operations

Emissions Source	**GHG emissions**	**CO_2 emissions alone**
Operation (direct)	3,879.00 $ktCO_2e/yr$	3,448.52 $ktCO_2/yr$
Operation (indirect)	202.58 $ktCO_2e/yr$	200.55 $ktCO_2/yr$
Total in kt	**4,081.58 $ktCO_2e/yr$**	**3,649.07 $ktCO_2/yr$**
Total in Mt	***4.1 $MtCO_2e/yr$***	***3.6 $MtCO_2/yr$***
Comparison		
Canada's Oil Sands Sector	72-100 $MtCO_2e/yr$	---

PART IV. ASSESSMENT OF THE PROJECT'S GHG IMPACTS

In the submissions that follow, CPAWS provides two analyses of the Project's environmental effects associated with its GHG emissions. Under the first analysis, we assess the Project's GHG annual emissions within the context of GHG reduction targets for 2030 and 2050 to which Canada has committed under the *Paris Agreement*. Analyzing a Project's annual emissions against the 2030 and 2050 targets provides a "snapshot in time" view of the Project's GHG impacts, but such an analysis, in our submission, fails to provide a more fulsome view of the Project's impacts from the totality of the GHGs that the Project would emit over its entire operational lifetime. Nevertheless, the snapshot view of the Project's annual emissions as a percentage of Canada's annual GHG target in 2030 and 2050 is helpful for the JRP to assess the significance of this Project's GHG emissions in terms of GHG reduction targets.

Under the second analysis, we assess the Project's GHG emissions through the use of a carbon budget approach that is consistent with Canada's obligations under the *Paris Agreement*. Unlike the snapshot approach, the carbon budget approach takes into account the cumulative GHG emissions from the Project over its operational lifetime. As explained below, such a cumulative view is important because of the fact that CO_2 stays in the atmosphere for periods of more than a thousand years.[60] The carbon budget approach compares the cumulative GHG emissions from this Project against Canada's cumulative GHG emission limit for "all time" in order to limit global warming to within 2°C from pre-industrial levels. This analysis provides the JRP with an alternative, and in our submission superior, approach to assess the significance of this Project's impact on climate change due to its cumulative GHG emissions.

Based on both these analyses, CPAWS submits that the Project, in terms of its GHG emissions, does not provide a positive contribution to sustainability, is inconsistent with Canada's climate change commitments, and in any case is likely to cause significant adverse environmental effects.

A. *Paris Agreement* and GHG Reduction Targets

As a signatory state to the *Paris Agreement*, Canada commits to limiting global temperature increase this century to within 2°C above pre-industrial levels, and to pursuing efforts to limit such

[60] Zickfeld Opinion, *supra* note 2 at para. 8.

an increase to within 1.5°C.[61] The *Paris Agreement* requires each party to provide Nationally Determined Contributions ("NDCs") that embody the efforts by each party to reduce national emissions.[62] Moreover, each party is required to submit their long-term low GHG emission development strategies.[63]

According to Canada's NDC, Canada commits to reduce GHG emissions by 30% below 2005 levels by 2030.[64] This target means that Canada aims to emit a maximum of 512.4 $MtCO_2e$/yr by 2030.[65] As part of Canada's requirement to provide long-term strategies, Canada has submitted its mid-century strategy.[66] Under this strategy, Canada aims to reduce GHG emissions by 80% below 2005 levels by 2050.[67] This target means that Canada aims to emit a maximum of 146.4 $MtCO_2e$/yr by 2050.[68]

As indicated above, Canada's oil sands sector emits about 72-100 $MtCO_2e$/yr. If this level of GHG emission were to be maintained, the oil sands sector would consume 14.1-19.5% of Canada's 2030 target, and 49.2-68.3% of Canada's 2050 target.[69] According to Dr. Donner:

> Meeting the 2050 target while maintaining or increasing extraction in the oil sands sector would therefore require a reduction of 88-93% from other economic sectors, or reliance on the purchase of international emissions credits (if a trading system is in place), currently unavailable "negative" emissions technologies, or forest and land management practices that lead to net carbon uptake. In my opinion, it is reasonable to conclude that emissions from the oil sands sector will need to decrease over the next three decades for Canada to be able to reach the 2050 target.[70]

Turning specifically to this Project, also as indicated above, GHG emissions associated with Project operations are about 4.1 $MtCO_2e$/yr. We can compare the Project's annual GHG emissions against Canada's NDC target in 2030 and Canada's mid-century target in 2050, since this Project is expected to be operational from 2020 to 2058. Comparing this Project's annual GHG emissions against the maximum national GHG emission targets that Canada has set, **this Project alone would consume 0.8% of Canada's emission target in 2030, and 2.79% of Canada's emission target in 2050.**[71]

Based on the above, CPAWS submits that this Project, if approved, would significantly hinder Canada's ability to meet its GHG reduction targets, and thereby significantly hinder Canada's

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[61] *Paris Agreement*, *supra* note 32, Article 2.
[62] *Ibid.*, Article 4, para. 2.
[63] *Ibid.*, Article 4, para. 19.
[64] Canada's First NDC (revised), 2017: http://www4.unfccc.int/ndcregistry/PublishedDocuments/Canada%20First/Canada%20First%20NDC-Revised%20submission%202017-05-11.pdf.
[65] Donner Opinion, *supra* note 1 at para. 8.
[66] *Canada's Mid-Century Long-term Low-Greenhouse Gas Development Strategy* (2016): http://publications.gc.ca/collections/collection_2017/eccc/En4-291-2016-eng.pdf.
[67] *Ibid.*
[68] Donner Opinion, *supra* note 1 at para. 8.
[69] *Ibid.* at para. 9.
[70] *Ibid.*
[71] Zickfeld Opinion, *supra* note 2 at para. 12 and Table 1.

transition to a sustainable economy. Also, CPAWS submits that this Project, from its annual GHG emissions, is likely to cause significant adverse environmental effects.

B. Carbon Budgets

Another way to assess the Project's impact on climate change is to use a carbon budget approach. A carbon budget is the total amount of CO_2 or GHG (expressed in CO_2e) emissions that can be emitted (globally or on a per-country basis) for all time that is consistent with a larger than 66% likelihood of limiting global temperature increase within a certain target.[72] CO_2 stands out among other GHGs because they stay in the atmosphere for a much longer period of time compared to other GHGs.[73] Due to the long atmospheric lifetime of CO_2 and the accumulation of CO_2 in the atmosphere, scientific evidence suggests that the effect of CO_2 on climate change is proportional not to the rate of CO_2 emission into the atmosphere, but rather to the total cumulative CO_2 emissions over time.[74]

A global carbon budget can be calculated for the maximum total amount of CO_2 or GHG emissions that the world can emit while maintaining a larger than 66% likelihood that global temperature increase would not exceed the thresholds established under the *Paris Agreement*. It is important to recognize that a global carbon budget provides the maximum allowable emission for all-time.[75] Additional emissions beyond the budget would diminish the likelihood of limiting global temperature increase within the *Paris Agreement* below 66%.

The global carbon budget consistent with the *Paris Agreement* can be allocated to signatory parties on a national basis. In this way, carbon budgets can be operationalized under domestic law and policy. There are various ways to allocate national carbon emissions under a carbon budget approach. The "emissions-based" approach allocates allowable carbon emissions based upon each country's share of current global emissions.[76] The "equity-based" approach allocates allowable carbon emissions based upon each country's share of current global emissions per capita.[77] Other mixed approaches exist that would generate a range of potential carbon budgets, but these two approaches provide the bookends of the spectrum in terms of a country's carbon budget.[78]

Dr. Donner analyzes the impact of Canada's oil sands sector on Canada's carbon budget if the current GHG emissions rate of 72-100 $MtCO_2e/yr$ from that sector were to be maintained. In his opinion, regardless of whether one uses an emissions-based or the equity-based allocation, GHG emissions from the oil sands sector are incompatible with Canada's carbon budget in order to meet the *Paris Agreement* targets.[79] CPAWS submits that further increase in GHG emissions from the oil sands would significantly hinder Canada's ability to contribute to the global effort to curb climate change within the *Paris Agreement* limits.

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[72] *Ibid.* at paras. 13-15; see also Donner Opinion, *supra* note 1 at para. 10.
[73] *Ibid.* at paras. 5-7.
[74] *Ibid.* at para. 5.
[75] *Ibid.* at para. 13.
[76] *Ibid.* at para. 16; see also Donner Opinion, *supra* note 1 at para. 12.
[77] *Ibid.*; see also Donner Opinion, *supra* note 1, *ibid.*
[78] *Ibid*.
[79] Donner Opinion, *supra* note 1 at paras. 13-15.

Dr. Zickfeld analyzes the impact of GHG emissions from this Project on Canada's carbon budget, focusing specifically on CO_2. According to Dr. Zickfeld, in order for global temperature increase to have a greater than 66% likelihood of staying within 2°C above pre-industrial levels, Canada's carbon budget ranges between 3,600 $MtCO_2$ (using the equity-based approach) and 14,400 $MtCO_2$ (using the emissions-based approach).[80] As indicated above, this Project is estimated to emit a total of 143.40 $MtCO_2$ over its entire project-life. **This Project alone would consume between 1 and 4% of Canada's all-time CO_2 budget for a 2°C target under the *Paris Agreement*.**[81]

Based on the above, CPAWS submits that this Project, if approved, would significantly hinder Canada's ability to contribute to the global effort to curb climate change, and significantly hinder Canada's transition to a sustainable economy. In the circumstances, CPAWS submits that this Project, based on its cumulative GHG emissions over the Project's lifetime, is likely to cause significant adverse environmental effects.

PART V. CONCLUSION

The JRP is required to conduct an environmental assessment under the *CEAA, 2012*. In this environmental assessment, the JRP has an information-gathering, an assessment, and a reporting duty. These three duties enable the JR to fulfil its critical role of providing a legally sufficient evidentiary basis for the ultimate decision-makers (the Minister and Governor in Council) to make the final determinations regarding this Project. In our submission, the JRP is required to provide the Minister and Governor in Council with a robust analysis of the Project's GHG emissions and climate change impacts.

In considering whether the Project is likely to cause significant adverse environmental effects from GHG emissions, we submit that the JRP should consider this Project's contribution to sustainability and this Project's impact on Canada's ability to meet its climate change commitments both domestically and internationally. To this end, the JRP should not only examine the Project's annual GHG emissions, but also the Project's total cumulative GHG emissions and their impact on Canada's GHG reduction targets and Canada's carbon budget consistent with the *Paris Agreement*.

In this case, maintaining or increasing GHG emissions from Canada's oil sands sector would significantly hinder Canada's ability to meet its NDC target of reducing national GHG emissions by 30% below 2005 levels by 2030, and its mid-century target of reducing national GHG emissions by 80% below 2005 levels by 2050. Furthermore, **this Project alone would consume 0.8% of Canada's emission target in 2030, and 2.79% of Canada's emission target in 2050.**

This Project's impact on Canada ability to curb climate change can also be assessed using a carbon budget analysis. The emissions-based and equity-based approaches to carbon budgeting provide a range of maximum total amount of CO_2 or GHG emissions that Canada can emit in order to help the world maintain a greater than 66% likelihood that global temperature increase will not exceed the thresholds established under the *Paris Agreement*. According to Dr. Donner, no matter which budget allocation approach we use, maintaining or increasing GHG emissions from the oil sands sector in general would be incompatible with Canada's carbon budget in order to meet the *Paris*

[80] Zickfeld Opinion, *supra* note 2 at para. 17 and Table 1.
[81] *Ibid.* at para. 18 and Table 1.

Agreement targets. Moreover, with regards to this particular Project, according to Dr. Zickfeld, **this Project alone would consume between 1 and 4% of Canada's all-time CO_2 budget for a 2°C target under the *Paris Agreement.***

The latest IPCC report illustrates the pressing need for "rapid and far-reaching transitions" to a carbon neutral economy in order to avoid 1.5°C of global warming. As a signatory to the *Paris Agreement*, Canada commits to pursuing efforts to limit warming below 1.5°C. This Project is simply not compatible with the urgent need for Canada to significantly reduce its GHG emissions.

Based on the foregoing, CPAWS submits that this Project, if it were to proceed, would significantly hinder Canada's ability to meet its GHG reduction targets, and thereby significantly hinder Canada's transition to a sustainable economy. Further, CPAWS submits that this Project is likely to cause significant adverse environmental effects when viewed both in terms of the Project's annual GHG emissions when compared to Canada's GHG reduction targets and in terms of its total GHG emissions over the Project's operational lifetime when compared with Canada's all-time carbon budget for meeting Canada's climate commitments under the *Paris Agreement*.

ALL OF WHICH IS RESPECTFULLY SUBMITTED 5 DECEMBER 2018:

PACIFIC CENTRE FOR ENVIRONMENTAL LAW
AND LITIGATION LAW CORPORATION
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