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Kearl Oil Sands Project

Addendum to EUB Decision 2007-013

Additional rationale for the joint review panel's conclusion on air emissions

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May 6, 2008

Addendum to EUB Decision 2007-013

Additional rationale for the joint review panel's conclusion on air emissions

On July 13, 2006 the federal Minister of Environment and the Chairman of the Alberta Energy and Utilities Board (EUB) signed an agreement establishing a Joint Review Panel for the Kearl Oil Sands Project. The Joint Panel was established to consider two applications to the EUB by Imperial Oil Resources Ventures Limited ("Imperial") for the construction and operation of an oil sands mining project and an associated cogeneration facility (the "Project") pursuant to the *Oil Sands Conservation Act* and the *Hydro and Electric Energy Act*. The Joint Panel was also established to conduct an environmental assessment of the Project pursuant to the *Canadian Environmental Assessment Act*.

The Joint Panel considered the Imperial applications at a public hearing that commenced on November 6, 2006 and concluded on November 29, 2006. On February 27, 2007, the Joint Panel issued EUB Decision 2007-013 (the "Decision") which included the Joint Panel's decision on the two EUB applications and its recommendations to the federal and provincial governments. The Joint Panel issued an erratum to the Decision on May 23, 2007 to address a minor omission from the Decision. The Joint Panel approved the EUB applications and concluded that the Project was not likely to cause significant adverse environmental effects, provided that the proposed mitigation measures and the recommendations of the Joint Panel were implemented. The Joint Panel also made recommendations to the federal and provincial governments that would aid in the mitigation of anticipated environmental and socioeconomic effects of the Project and would address the need for follow-up measures.

The Pembina Institute for Appropriate Development (the "Pembina Institute") filed an application for judicial review of the Decision with the Federal Court of Canada pursuant to sections 18 and 18.1 of the *Federal Court Act*. The Pembina Institute contended that the Joint Panel failed to comply with mandatory steps prescribed by the *Canadian Environmental Assessment Act* and the Joint Panel agreement. The Pembina Institute argued that the Joint Panel made reviewable errors in relation to three issues:

- Cumulative Effects Management Association (CEMA), Watershed Management and Landscape Reclamation;
- Endangered Species; and
- Greenhouse Gas (GHG) Emissions.

The Federal Court found no reviewable errors on the first two grounds but concluded that the Joint Panel failed to provide rationale in support of its conclusion that the Project "is not likely to result in significant adverse environmental effects to air quality, provided that the mitigation measures and recommendations proposed are implemented".¹ The Court remitted the matter back to the Joint Panel, directing it to provide additional rationale for this conclusion.

On March 31, 2008, Dr. W. Tilleman, Q.C., Chairman of the EUB and Mr. P. Sylvester, President of the Canadian Environmental Assessment Agency (the "Agency"), wrote to interested parties and requested comments on the following two procedural matters:

1. The original members of the Panel can reconvene and issue additional reasons pursuant to the *Canadian Environmental Assessment Act* and under subsection 80(3) of the *Alberta Utilities Commission Act*, notwithstanding the January 15th, 2008 reorganization of the EUB.
2. As one of the three Panel members has retired from the EUB (Mr. John Nichol), the Panel can reconvene with the remaining two members under section 11 of the *Alberta Energy and Utilities Board Act* and subsection 22(1) of the federal *Interpretation Act*.

No interested party commented on the procedural issues specified in the March 31, 2008 letter from the EUB and the Agency. Accordingly, the Joint Panel reconvened with two of the original three members, Mr. T. McGee, and Mr. L. Cooke from April 11 to May 6, 2008 with the express purpose of providing the additional rationale requested by the Federal Court. In a letter dated April 22, 2008, the Joint Panel informed interested parties that it would not seek further evidentiary or procedural input in support of its additional rationale.

The Joint Panel emphasizes that these additional reasons should not be read in isolation; rather they must be interpreted within the context of Decision 2007-013, particularly section 13 of that decision which specifically addressed air emissions. The Joint Panel has not reproduced the views of the parties in this Addendum and has not commented on issues it considers were fully addressed in section 13 of the Decision such as the proposed retrofitting of existing mine fleets to meet Tier IV emission standards or the treatment of exceedances in developed areas and the usefulness of the fourth present-day modeling scenario.

In this Addendum the Joint Panel has attempted to enhance and reformat its views to better communicate its rationale for its conclusion regarding air emissions, including GHG. In that respect, the Joint Panel will first comment generally on the nature of the evidence presented on air emissions. It will then specifically examine those emissions that interested parties focused on at the proceeding, NO_x/SO_x and to a lesser degree, GHG. The Joint Panel will also provide a better description of the mitigation measures it relied upon to conclude that the Project is not likely to result in significant adverse environmental effects to air quality.

The conclusion impugned by the Federal Court related to air emissions in general which included, but was not limited to, GHG. Other emissions considered by the Joint Panel in section 13 of its decision were NO_x, NO₂, SO₂, PM_{2.5}, ozone and acid deposition. The Joint Panel's ultimate conclusion in section 13 related to all of the emissions considered and was not limited to GHG. While the concern expressed by Justice Tremblay related to GHG, the Joint Panel finds that the additional rationale for its conclusion must address all of the air emissions considered to effectively explain its overall conclusion on air quality.

Prior to addressing the effects of the Project's predicted air emissions, the Joint Panel is compelled to comment on the nature of the evidence brought forward by interested parties. The Joint Panel observes that there was considerable evidence presented in relation to NO_x/SO_x and, to a lesser degree, GHG. The Joint Panel considers it relevant to note that a significant proportion of the evidence presented on NO_x/SO_x and GHG was regional in nature and focused on the pace of development in the area rather than the Project itself. The Joint Panel understands this to be, at least in part, a result of the Kearn application being the last in a series of three oil sands applications considered for approval in the summer and fall of 2006.

A factor that figured in the Joint Panel's conclusion on air emissions was its determination that Imperial's Environmental Impact Assessment (EIA) cases were conservative and likely over-predicted

potential exceedances and effects. Some of the conservative assumptions built into the assessment included:

- The operation of boilers and cogeneration equipment at full capacity 365 days a year.
- The air quality assessment completed for the Project evaluated NO_x emissions based on a 67 percent load factor for trucks greater than 750 horsepower and a 100 percent load factor for other vehicles. Imperial noted that a manufacturer suggested that a load factor of 20 to 50 percent is in the high range for large trucks and that the United States' Environmental Protection Agency (US EPA) recommends a load factor of 59 percent when onsite data is unavailable.
- The air quality assessment calculated NO_x based on compliance with Tier II emissions standards. However, when activity levels are greatest Imperial must comply with Tier IV standards.

It was Imperial's evidence, which the Joint Panel accepts, that the EIA cases, particularly those involving air quality and acidification effects, were conservative and likely over-predicted potential effects. Support for this contention came from the evidence of Alberta Health and Wellness (AHW) who testified that predicted exceedances in the EIA are generally a result of the conservative assumptions upon which the assessment is built, including the use of guidelines and model input parameters that were generally very conservative.

The fact that AHW agreed with Imperial's conclusion that potential impacts for the application case and the planned development case were negligible for most parameters and negligible to low for acrolein also contributed to the Joint Panel's conclusion on air emissions.

While none of the above factors were determinative in the Joint Panel's conclusion on air emissions, they were considerations that played a role in the Joint Panel's ultimate determination. It was within the context of these general considerations that the Joint Panel weighed the predicted effects of the Project's air emissions and the various mitigation measures proposed.

NO_x and Related Emissions

Considerable evidence was presented to the Joint Panel on the issue of the Project's NO_x emissions. The EIA predicted that the Project's stationary sources and its mobile mine fleet will represent an 11 per cent increase of regional NO_x emissions. Further, Alberta Environment (AENV) suggested that regional NO_x emissions were projected to increase due to the number and size of proposed projects, including Kearl, leading to increased NO₂ levels, which could in turn lead to an increased potential for environmental impacts associated with acid deposition and nitrogen eutrophication. However, a number of NO_x mitigation measures were discussed in detail at the hearing, including the following:

Federal Government initiatives:

- Large off road vehicles (mine fleet vehicles) will be required to use ultra-low-sulfur diesel by 2010. The Joint Panel accepted evidence presented at the hearing by Environment Canada (EC) and Imperial that this measure alone could reduce NO_x, PM_{2.5} and sulfur emissions by 16, 17 and 97 per cent respectively.
- Tier IV emission performance standards will be phased in between 2011 and 2015. It was Imperial's evidence that Tier IV performance for large trucks represents a 38 percent reduction in NO_x emissions from Tier II levels.

Alberta Government Initiatives:

- AENV is conducting a review of Best Available Technology Economically Available (BATEA) for stationary NO_x emissions sources and noted that any *Environmental Protection and Enhancement Act* (EPEA) approval it may issue could require Imperial to participate in the BATEA study and implement its findings.

Commitments by Imperial:

- To meet or exceed the Canadian Council of Ministers of the Environment (CCME) guidelines for stationary sources through optimized combustion control, including the use of low-NO_x burners;
- To purchase and operate the mine fleet to meet or exceed the regulations in place at the time of purchase; and
- To participate in AENV's BATEA study for stationary sources.

The Joint Panel finds the measures proposed by Imperial to be economically and technically feasible and, when considered within the context of the federal and provincial NO_x initiatives, will mitigate any significant adverse environmental effects of the Project's NO_x emissions. In that respect the Joint Panel considers it pertinent that the Oil Sands Environmental Coalition (OSEC) testified that its NO_x related concerns for the Project would be addressed by Imperial's participation in the provincial BATEA NO_x study and the implementation of any revised standards resulting from the study.

Finally, the Joint Panel considers it appropriate to reaffirm the following passage from page 59 of Decision 2007-013:

With respect to the use of ultra-low-sulphur diesel fuel in mine equipment, the Joint Panel agrees with EC and encourages Imperial Oil to implement the use of ultra-low-sulphur for all of its construction and mining activities ahead of any mandatory requirements.

Greenhouse Gases

The Joint Panel accepts that, based on Imperial's EIA, GHG emissions from the Project will be in the order of 40 kg of carbon dioxide equivalent (CO_{2e}) per barrel of bitumen and that the Project will contribute 3.7 million tonnes of GHG in CO_{2e} per year. This represents 0.51 per cent of national GHG emissions and about 1.7 per cent of Alberta's GHG emissions. The Joint Panel also accepts that the fastest growing source of GHG emissions in Canada is the development of Alberta's oil sands and that total GHG emissions from oil sands production could account for approximately 10 per cent of the nation's total GHG emissions.

While the Joint Panel acknowledges that the projected GHG emissions of 40 kg of CO_{2e} per barrel for the Project represent considerable GHG emissions, there was very little evidence before the Joint Panel to suggest that this release will result in significant adverse environmental effect. To the contrary, it was the evidence of AENV that it may require Imperial to reach its stated GHG intensity target of 40 kg of CO_{2e} per barrel in any EPEA approval granted for the Project. The Joint Panel finds that it must give AENV's endorsement of the target significant weight in its consideration of the adverse environmental effects of the Project given AENV's role as the provincial agency responsible for establishing, monitoring and enforcing emission standards.

Another important factor considered by the Joint Panel were the measures proposed by Imperial to reduce Project air emissions, including GHG. The Joint Panel also finds that the following measures proposed by Imperial for the Project will have the effect of mitigating Project emissions including GHG.

1. Cogeneration for steam and electricity production;
2. Selection of the low temperature process to extract bitumen from oil sands;
3. Installation of vapour recovery systems on appropriate tankage to comply with EUB Guide 60 (now Directive 60);
4. Compliance with EUB Guide 60;
5. Design and operation of the plant emergency relief and flare system to comply with EUB Guide 60, to ensure there is no continuous flaring and to ensure that flares operate at high efficiency;
6. Management of fugitive emissions through a program aligned with many of the objectives and strategies in the CCME "Environmental Code of Practice for the Measurement and Control of Fugitive Emissions from Equipment Leaks";
7. Regular maintenance on mine fleet vehicles to retain performance;
8. Optimization of ore loading on haul trucks to maximize efficiency;
9. Optimization of mine haul routes to minimize fuel consumption;
10. Post startup energy audits;
11. Reporting on GHG emissions;
12. Benchmarking performance against other operations.

The Joint Panel considers all of these measures to be economically and technically feasible and finds that their implementation will likely reduce air emissions generally and that implementation of the majority of these items will likely reduce Project GHG emissions below AENV's proposed 40 kg of CO_{2e} per barrel GHG intensity target. In the Joint Panel's view these measures, in conjunction with AENV's intensity target will likely mitigate any significant GHG effects of the Project.

While Imperial did not develop a specific GHG management plan for the Project, the Joint Panel finds that Imperial's corporate energy efficiency program, as well as specific measures proposed by Imperial, are an effective surrogate. The Joint Panel understands the premise behind this approach is that managing GHG obligations on a corporate basis is more cost-effective than management on an individual facility basis.

The Joint Panel observes that this corporate program has proven effective for Imperial in the past. One pertinent example of this program's effectiveness is the joint development, with Syncrude, of the low-energy extraction process that is currently used throughout the oil sands mining industry. Another example of the program's success is an eight per cent increase in energy efficiency at its refineries since 2000. The Joint Panel acknowledges that the impact of this corporate policy on the Project are currently unknown and thus its implementation cannot be considered a mitigation measure when assessing the significance of the Project's effects on air quality. However, the Joint Panel is confident that Imperial will continue to experience success with this global policy resulting in further emissions reductions from the Project.

In addition to specific measures proposed for the Project and Imperial's corporate energy efficiency program, the Joint Panel also noted Imperial's commitment to research and development of energy technology that increases efficiency and reduce emissions. Of interest to the Joint Panel was an Imperial sponsored initiative at the University of Alberta with the mandate to find more efficient, economically viable and environmentally responsible ways to develop Canada's oil sands resources. The Joint Panel considers this to be a worthwhile initiative that will likely produce further energy efficiencies for future oil sands activities. However, it did not consider this to be a specific mitigation measure in its assessment of the Project's effect to air quality.

The Panel also relied on the evidence presented by the Government of Alberta regarding potential conditions to be included in any EPEA approval granted for the Project including :

- Implementation of a fugitive emissions control (leak detection and repair program);
- Implementation of a volatile organic compounds emissions monitoring;
- participation in CEMA and Wood Buffalo Environmental Association work to address trace air contaminants, including but not limited to benzene and acrolein, and
- participation in regional acid deposition and eutrophication monitoring programs.

The Joint Panel considers effective monitoring of potential emission sources to be a crucial element of any mitigation plan and observes that AENV's proposed conditions overlap, to some degree with the measures proposed by Imperial.

The Joint Panel also relied upon the pending implementation of comprehensive new GHG emission requirements in Alberta when arriving at its conclusion on the Project's effects to air emissions. Although Alberta's GHG regulatory framework is not yet finalized and the *Climate Change and Emissions Management Act* and associated regulations are still under development, the Joint Panel understands that Alberta has committed to reduce GHG emissions on a GHG intensity basis. It notes that the *Climate Change and Emissions Management Act* and the proposed *Specified Gas Emitters Regulation* will be used to implement this framework for the control of GHG emissions in Alberta. The regulations are intended to specifically address GHG emissions by large industrial emitters including oil sands developments.

The Joint Panel believes that adaptive management will be required by Imperial to meet the forthcoming GHG emissions intensity targets. The Joint Panel understands that the Project will be required to meet the standards established by these new requirements, which will be applied to all such developments, existing and proposed. Assuming the new regulations are completed in a timely manner, the Joint Panel is of the view that Imperial should comply with these new requirements prior to start-up of its installation.

The Joint Panel wishes to emphasize its view, as stated previously in Decision 2007-013, that the Governments of Canada and Alberta must address the issue of GHG emissions and other key issues with urgency if development of the oil sands is to continue at the proposed pace. Further, the Joint Panel considers it necessary to restate its recommendation that EC work with AENV in the development of the province's GHG regulatory framework.

The Joint Panel finds that Alberta's plan to implement intensity-based targets to reduce GHG is an effective way to limit and monitor GHG emissions from the oil sands and other large emitters. The Joint Panel observes that implementation of such a regulatory scheme will likely result in GHG emissions, on a project and regional basis that will be lower than if the status quo was maintained. However, the Joint Panel emphasizes, that the implementation of statutory intensity targets is just one of several means by which the GHG emissions from oil sands projects may be mitigated at the regional level.

The Joint Panel notes that Imperial was confident that it could meet all new provincial and/or federal GHG requirements when they are enacted. However the Joint Panel observes that Imperial had not developed specific plans for meeting these yet to be determined requirements. While this is not unexpected given the uncertainties in the regulatory environment, the Joint Panel reiterates the need for Imperial to be aware of reasonably foreseeable changes to current emission standards and new environmental management frameworks. Imperial must incorporate sufficient flexibility in the design of the Project to facilitate retrofitting of the new controls needed to fully comply with future standards under development by the Governments of Alberta and Canada.

The Joint Panel does not concur with the Oil Sands Environmental Coalition's recommendation to require Imperial to reduce and/or offset the Project GHG emissions at start-up to significantly below the Project's planned emission level and to progressively tighten the levels so as to achieve net zero emissions (carbon neutral) production by 2020. As stated in its report, the Joint Panel is of the view that issues related to development of the mineable oil sands are in many cases regional and not the sole responsibility of the applicant for a project. The Joint Panel reiterates the importance of the Governments of Alberta and Canada taking more aggressive leadership roles in completing the management frameworks and integrated plans that would establish the context for management of the cumulative environmental impacts of oil sands developments instead of on a project by project basis. By doing so, the Joint Panel is of the view that EC's projection, that GHG emissions from oil sands could account for 10 per cent of Canada's GHG emissions, could be significantly reduced.

Conclusion

Taking into account the conservative nature of the EIA and having considered the projected emissions from the Project, the proposed mitigation measures, the various federal and provincial government initiatives relating to air emissions, including NO_x and GHG, and this Joint Panel's own recommendations, the Joint Panel conclusion on air emissions, including GHG, has not changed. For the reasons expressed above, the Joint Panel remains of the view that the Project is not likely to result in significant adverse environmental effects to air quality, provided that the mitigation measures and recommendations proposed are completed and implemented. The Joint Panel again emphasizes that the onus is now on the Governments of Canada and Alberta to finalize and implement the regulatory framework for GHGs in a timely manner.

¹ EUB Decision 2007-013, Page 60

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