



Petro-Canada Oil Sands Inc.

Application to Construct and Operate an Oil Sands
Upgrader in Sturgeon County

January 20, 2009

ENERGY RESOURCES CONSERVATION BOARD

Decision 2009-002: Petro-Canada Oil Sands Inc., Application to Construct and Operate an Oil Sands Upgrader in Sturgeon County

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ENERGY RESOURCES CONSERVATION BOARD

Calgary Alberta

PETRO-CANADA OIL SANDS INC. APPLICATION TO CONSTRUCT AND OPERATE AN OIL SANDS UPGRADER IN STURGEON COUNTY

Decision 2009-002
Application No. 1490956

1 DECISION

Having carefully considered all of the evidence, the Energy Resources Conservation Board (ERCB/Board) finds the project to be in the public interest. Accordingly, the Board is prepared, with the approval of the Lieutenant Governor in Council, to approve Application No. 1490956, subject to the commitments made by Petro-Canada Oil Sands Inc. (PCOSI) listed in Appendix 1 and subject to the conditions listed in Appendix 2.

In recommending that the Lieutenant Governor in Council grant approval, the Board notes that there is a need for the federal, provincial, regional, and municipal levels of government to assess and provide for, on an ongoing basis, appropriate levels of infrastructure and services driven by the project and other future projects, including medical and social services, policing, traffic control, and environmental protection. These matters are discussed further in this report.

2 INTRODUCTION

2.1 Application

On December 8, 2006, pursuant to Section 11 of the *Oil Sands Conservation Act*, PCOSI filed Application No. 1490956 with the Alberta Energy and Utilities Board (EUB), the statutory predecessor of the ERCB, and Alberta Environment (AENV) for approval to construct, operate, and reclaim a 54 000 cubic metres per day (m³/d) oil sands bitumen upgrader on behalf of the Fort Hills Energy Corporation and Fort Hills Energy L.P. (Fort Hills). The ERCB assumed jurisdiction over the PCOSI application on January 1, 2008, pursuant to Section 80 of the *Alberta Utilities Commission Act*. An environmental impact assessment (EIA) report formed part of Application No. 1490956.

The proposed PCOSI upgrader project would be located in Sturgeon County, about 15 kilometres (km) north of the City of Fort Saskatchewan in an area known as the Alberta Industrial Heartland (AIH).¹ Sturgeon County has zoned the area as “heavy industrial.” It contains numerous hydrocarbon, petrochemical, and other processing plants, as well as some residences and agricultural operations.

The project would be developed in two phases. Phase 1 would process 26 400 m³/d of bitumen and Phase 2 would process a cumulative total of 54 000 m³/d of bitumen, with both phases

¹ The AIH is a 533 km² area northeast of the City of Edmonton that includes a portion of Sturgeon County, the City of Fort Saskatchewan, Strathcona County, and Lamont County. The AIH is one of Canada’s largest processing centres for petroleum, petrochemicals, and industrial chemicals.

producing synthetic crude oil, petroleum coke, sulphur, diluent, and other light hydrocarbon products.

PCOSI also filed the following applications with AENV:

- Application No. 001-231303, pursuant to the *Environmental Protection and Enhancement Act (EPEA)*, to construct and operate a 54 000 m³/d upgrader and associated infrastructure.
- File No. 00236443, pursuant to Sections 36, 37, 49, and 50 of the *Water Act*, to authorize site water management plans for the construction, maintenance, and operation of the upgrader. The file numbers for the original (2006) application and the revised (2008) application are 00236443 and 00248027 respectively. The original application requested approval for withdrawal of water from the North Saskatchewan River and diversion of surface water, whereas the revised application requested approval for the diversion of surface water only.

2.2 Background

In May 2006, PCOSI filed a public disclosure document and proposed terms of reference (TOR) for its EIA. On November 1, 2006, AENV issued the final TOR for the EIA, and on December 8, 2007, PCOSI filed its applications with the ERCB and AENV.

On December 5, 2007, AENV declared that the documents submitted by PCOSI addressed the information requirements set out in Section 49 of the *EPEA* and the final TOR. AENV declared that the EIA report was complete, pursuant to Section 53 of the *EPEA*.

In a letter to the Board dated December 28, 2007, the Northeast Sturgeon County Industrial Landowners and the Citizens for Responsible Development (NESCIL/CFRD) requested a ruling from the Board that the members of NESCIL/CFRD were directly affected by Application No. 1490956. Furthermore, NESCIL/CFRD requested that the Board conduct a prehearing meeting to obtain input from NESCIL/CFRD and other participants on the scope of the hearing, timing, procedures, participant roles, and funding.

On March 14, 2008, a prehearing meeting was held in Fort Saskatchewan, Alberta, before Board Members J. D. Dilay, P.Eng., G. J. Miller, and B. T. McManus, Q.C. With respect to matters arising from the prehearing meeting, the Board issued *Decision 2008-024*.

On April 2, 2008, the Board issued a Notice of Hearing.

2.3 Interventions

NESCIL/CFRD, whose members' properties ranged from being adjacent to the project lands to one as far as 35 km away, filed an intervention citing concerns regarding current and future development, choice of technology, products and emissions from the project, project impacts on air, water, and soil, noise, light impacts, greenhouse gas emissions, vehicular and train traffic, emission effects on human health, wildlife, vegetation, livestock, and livestock operations, and emergency response planning. NESCIL/CFRD opposed the application. A list of NESCIL/CFRD members is in Appendix 3.

Stewart Shaw and Karen Shaw (the Shaws), whose property was adjacent to the project lands, filed an intervention citing concerns regarding the impacts of the project on their land, their health, and their livestock's health. The Shaws also expressed concerns regarding noise, dust, and light pollution arising from the project, increased traffic, and increased security risks to them and their property. The Shaws opposed the application.

Ken Smulski, whose properties were adjacent to the project lands, filed an intervention on behalf of SV Half Diamond Ranch and SV Farms Ltd., citing concerns regarding groundwater, surface water, air, noise, traffic, land use, and cumulative effects. Mr. Smulski did not specifically state whether he was opposed to or supported the application.

Rudy Hoehn, whose property was about 3 km from the project lands and within the AIH, filed an intervention citing concerns regarding the project's impact on his quality of life and on his physical and mental health, the project's destruction of natural habitats for flora and fauna, and the noise, light, esthetic, and socioeconomic impacts arising from the project. Dr. Hoehn opposed the application.

The Métis Nation of Alberta (MNA) filed an intervention citing concerns regarding the impacts of the project on air quality, wildlife habitat, the river and water table, and the current and future use of constitutionally protected Métis harvesting and cultural rights. The MNA also filed a Notice of Constitutional Question with the ERCB pursuant to Section 12 of the *Administrative Procedures and Jurisdiction Act (APJA)*. The Board's decision on this matter is detailed in Section 3: Procedural Issues of this report.

Total E&P Canada Ltd., Suncor Energy Inc., Synenco Energy Inc., Shell Canada, StatoilHydro, and North West Upgrading Inc. (North West) filed interventions. They took no position with respect to the application but reserved the right to cross-examine and present argument at the hearing.

The Town of Gibbons, Town of Redwater, Town of Bon Accord, Dr. D. Maskell, the Alberta Industrial Heartland Association (AIHA),² the Sturgeon County Economic Development Board, Brendan Gillen, and Sturgeon County filed letters in support of the application. Toxics Watch Society filed a letter in support of PCOSI's selective catalytic reduction technology.

During the hearing, S. Howard filed an objection to the application citing concerns regarding pollution and destruction of agricultural land. Mr. Howard did not participate in the hearing.

E. Beukes, J. Hiemstra, B. Boccock, J. Visser, T. Andrews, and R. Merry requested the opportunity to briefly address the Board. As these individuals had not registered to participate in the hearing and did not live or work in the area, the Board allowed them to participate in the hearing as discretionary participants. Their concerns included the need for the Board to take a broader, more integrated view of the impacts of development, the need for the government to redefine what they described as the Board's narrow concept of the public interest, health and environmental impacts from the proposed project, land use, and soil preservation.

²The AIHA consists of representatives from Lamont County, Sturgeon County, Strathcona County, and the City of Fort Saskatchewan.

2.4 Hearing

The Board held a public hearing in Fort Saskatchewan, Alberta, which commenced on June 23, 2008, and concluded on July 4, 2008, before Board Members J. D. Dilay, P.Eng. (Presiding Member) and J. D. Ebbels and Acting Board Member J. G. Gilmour. Those who appeared at the hearing are listed in Appendix 4.

On August 13, 2008, the Board requested additional information from PCOSI respecting the impacts of its proposed work camps. The Board reopened the hearing on October 21, 2008, to consider additional evidence submitted by PCOSI and some of the interveners, as set out in Appendix 4. In general, the interveners were concerned about the impact that the residents of the work camps would have on traffic, availability of medical services, drug and alcohol use (including while driving), and the risk the residents of the work camp posed to the safety and security of people and their property in the area.

The Board considers that the record was completed on November 10, 2008.

Figure 1 shows the location of the proposed project, the location of the interveners' lands, and other major features of the area. The Board and its staff visited the proposed project site and the surrounding area on June 24, 2008.

3 PROCEDURAL ISSUES

3.1 Motion to Compel the Attendance of Witnesses

On June 11, 2008, NESICL/CFRD filed a motion with the Board seeking to compel the attendance of M. Boyd, R. Chabaylo, and K. Purves at the public hearing. Mr. Boyd and Mr. Chabaylo were employees of AENV and Mr. Purves was the Chairman of the Fort Air Partnership (FAP). NESICL/CFRD sought to cross-examine Mr. Boyd on the EIA review process, including AENV's use of third-party consultants for the review of the EIA and the decision to declare the EIA complete. NESICL/CFRD sought the attendance of Mr. Chabaylo and Mr. Purves to better understand the role of AENV within FAP and to better understand FAP's mandate.

On June 17, 2008, counsel for AENV filed its response to the motion, as did Mr. Purves on behalf of FAP. On June 18, 2008, NESICL/CFRD filed its reply to those responses.

When considering a motion to compel a witness, the Board has used the following two-part test:³

- 1) Is the evidence sought in the motion critical to the Board's understanding of the issues before it?
- 2) Is there no other reasonable means by which the evidence can be adduced?

Having applied the above test, the Board was not convinced that the evidence sought by NESICL/CFRD from these witnesses was critical to its understanding of the issues raised by the

³ As described in ERCB Decision 1994-02: *Well Licences, Moose Mountain, Area Husky Oil Operations* and EUB Decision 1995-06: *Shell Canada, Sour Natural and Fuel Gas Pipelines in Carbondale Area*.

application. Further, the Board found that evidence regarding the sufficiency and accuracy of the EIA, the sufficiency and accuracy of air monitoring information relied upon by PCOSI, and the appropriateness of the FAP monitoring program could best be obtained by the parties to the proceeding, including PCOSI's and NESICL/CFRD's own witnesses.

The Board's reasons for denying the request were provided to interested parties on June 19, 2008, by way of letter from ERCB counsel to interested parties. That letter is attached to this decision as Appendix 5.

3.2 Notice of Constitutional Question

On June 13, 2008, the MNA filed a Notice of Constitutional Question with the ERCB pursuant to Section 12 of the *APJA*. In it, the MNA raised the following question:

Has the Crown discharged its duty to consult the Métis Nation of Alberta ("MNA") with respect to potential infringements of Aboriginal rights protected under section 35(1) of the *Constitution Act, 1982* which may arise if Application No. 1490956 to the Energy Resources Conservation Board is granted approval for construction and operation of the proposed Fort Hills Sturgeon Upgrader and associated infrastructure in Sturgeon County.

On June 17, 2008, Alberta Justice wrote to the Board and stated its intention to attend at the public hearing of the application to speak to this matter. Alberta Justice advised the Board that it intended to challenge the Board's jurisdiction to consider the Notice of Constitutional Question because the notice did not comply with the requirements of the *APJA*.

The Board considered its jurisdiction to entertain the Notice of Constitutional Question at the outset of the public hearing as a preliminary motion. The Board provided the MNA with an opportunity to supplement its written submission and then heard from PCOSI and Alberta Justice. The MNA was afforded the right of last reply with respect to the notice.

The MNA told the Board that it was seeking intervener status pursuant to Section 26 of the *Energy Resources Conservation Act (ERCA)* based upon rights provided under Section 35 of the *Constitution Act, 1982*. The MNA clarified that it was not asking the Board to determine whether PCOSI had engaged in appropriate consultation with the MNA. Rather, the MNA requested the Board to defer its decision on the PCOSI application to allow the necessary consultation to take place. The MNA asserted that because it was not challenging the constitutional validity of any legislation, it was not necessary to strictly adhere to the 14-day notice period provided by the *APJA*. In support of this assertion, the MNA cited case law derived from the constitutional notice provisions of the *Judicature Act*. The MNA emphasized that its position with respect to consultation went to the issue of its status as an intervener and thus did not necessarily require the Board to make a determination with respect to the MNA's constitutional rights.

The MNA also argued that some of its members were landowners living close to the project and would be entitled to participate in the proceeding based upon rights arising from a number of sources, including Section 7 of the *Canadian Charter of Rights and Freedoms*.

PCOSI contended that the MNA's notice was deficient because it did not meet the filing deadline provided in the *APJA*. PCOSI pointed out that Section 10 of the *APJA* clarified that a question of constitutional law included a determination of any right under the Constitution of Canada and the

Alberta Bill of Rights. PCOSI argued that because the notice did not meet the statutory filing requirements, the Board had no jurisdiction to consider it. PCOSI did not object to the participation of the MNA at the proceeding as long as it did not raise any questions of constitutional law.

Alberta Justice argued that the starting point for considering the MNA submission was Section 10 of the *APJA*, which states: “Notice of Constitutional Question means ‘any determination of any right under the Constitution of Canada or the Alberta Bill of Rights.’” Alberta Justice contended that the provisions of the *APJA* were broader than the provisions of the *Judicature Act* cited by the MNA in its oral and written submissions. Alberta Justice asserted that the issues raised by the MNA were questions of constitutional law as “constitutional law” was defined and thus that the statutory notice requirements of Section 12 applied. Alberta Justice argued that because the language of Section 12 was mandatory, the ERCB had no discretion to relax the 14-day notice period it required. Alberta Justice also contended that the notice was likewise deficient in describing the witnesses the MNA intended to call or the documents it would rely upon.

In response to PCOSI and Alberta Justice, the MNA argued that the Board’s duty to provide fair process pursuant to Part 1 of the *APJA* overrode the notice provisions for questions of constitutional law provided in Section 12 of the *APJA*.

The Board adjourned the proceeding to deliberate on the matter and then issued its ruling on the notice orally. In summary, the Board ruled that it had no jurisdiction to consider the application, as the MNA failed to meet the notice requirements prescribed by Section 12 of the *APJA*. The Board further denied the MNA’s application for intervener standing pursuant to Section 26 of the *ERCA* on the grounds that it had insufficient information before it to make such a determination. However, the Board ruled that the MNA could participate in the proceeding as a “discretionary participant” and make a short submission following the evidence of PCOSI and the registered interveners.

The full text of the Board’s ruling on the Notice of Constitutional Question is attached to this decision as Appendix 6.

4 ISSUES

PCOSI stated that Canadian sources of light crude oil were rapidly declining and that alternative heavier sources of hydrocarbons must be developed to sustain the Canadian and Alberta economies. PCOSI submitted that most refineries in North America were designed to process light and medium crude oil and therefore there was a need to develop upgraders to convert heavier hydrocarbons into petroleum feedstock suitable for existing refineries. PCOSI further noted that value-added upgrading of energy resources in Alberta was a high priority for the Alberta Government.

The Board notes that no concerns were expressed by any participants with respect to the need for the PCOSI upgrader project. The Board acknowledges Alberta’s strategy for value-added resource development in Alberta and the role that the project could play in that strategy. Therefore, the Board is satisfied that there is a need for the project.

In rendering its decision on this application, under Section 3 of the *Energy Resources Conservation Act* the Board must consider whether the project, including the proposed work camps, is in the public interest, having regard to the social and economic effects of the project and the effects of the project on the environment. As a result, the Board finds that it must consider the following issues that arose during the course of the proceeding in determining whether the project is in the public interest:

- socioeconomic effects
 - project economic benefits
 - road infrastructure and rail traffic
 - project location
 - buffer zone
 - voluntary property purchase program
 - work camps
- safety
 - emergency response planning
 - Northeast Region Community Awareness and Emergency Response
- air
 - air emissions and modelling
 - air monitoring and FAP
 - other air issues
- health
 - human health risk assessment methodology
 - predicted health impacts
 - livestock health
- surface water and groundwater
- soil
 - soil salvage, storage, and reclamation
 - soil monitoring
- vegetation
- weed and pest management
 - potato cyst nematode
- noise
- light
- technology
 - gasification
 - delayed coking
 - flaring
- cumulative effects
- term limits

In reaching the determinations contained within this decision, the Board has considered all relevant materials constituting the record of this proceeding, including the evidence and argument provided by each party. Accordingly, references in this decision to specific parts of the record are intended to assist the reader in understanding the Board's reasoning relating to a particular matter and should not be taken as an indication that the Board did not consider all relevant portions of the record with respect to that matter.

5 SOCIOECONOMIC EFFECTS

5.1 Project Economic Benefits

5.1.1 Views of PCOSI

PCOSI submitted that its upgrader project would create significant economic value for the province, Sturgeon County, and the surrounding municipalities. PCOSI estimated that its capital investment in the project would be between \$11 billion and \$17 billion. PCOSI projected that it would pay \$8.9 billion in provincial and \$17.0 billion in federal taxes over the 30-year life of the project and \$50 million per year in taxes to Sturgeon County. PCOSI stated that the project would employ some 3000 construction workers with a peak workforce of 4500 workers. PCOSI stated that the project, once operational, would employ 500 direct workers and on-site contractors. PCOSI also noted that the local community would benefit from being able to use the improved infrastructure that would be funded by the project.

5.1.2 Views of the Town of Gibbons

Deputy Mayor Fraser, on behalf of the Town of Gibbons, spoke in support of the PCOSI project. He submitted that the project would be a significant long-term contributor to Alberta's economy and to the economy of the Town of Gibbons. He indicated that continued industrial development in Sturgeon County was in the best interest of the Town of Gibbons.

5.1.3 Views of Sturgeon County and AIHA

Mayor Rigney, on behalf of Sturgeon County, spoke in support of the PCOSI project. The mayor stated that the project was a vital component of Sturgeon County's economic, industrial, and community development strategy and that the project would provide considerable benefits to the county, other municipalities, the Province of Alberta, and all Canadians. The mayor stated that the project embodied the long-term vision of value-added industry and business development for Sturgeon County. It would provide for a sustainable community, a sustainable municipal tax base, and a sustainable municipality, which would provide much-needed employment opportunities and improved quality of life for all.

The mayor also spoke on behalf of the AIHA and stated that the proposed project fit with the long-term vision for development within the area.

5.1.4 Views of the Board

The Board acknowledges the economic benefit associated with PCOSI's project. While the taxes generated by the project will be partially offset by the need to invest in new infrastructure and

expanded public services, the Board believes that the project will provide significant positive economic benefits. The Board notes Alberta's strategy for value-added resource development in Alberta and the role that the project could play in that strategy.

5.2 Road Infrastructure and Rail Traffic

5.2.1 Views of PCOSI

PCOSI stated that it had taken steps to mitigate impacts on the surrounding community resulting from traffic congestion, rail traffic, and road safety in the area.

At the opening of the hearing, PCOSI stated that it proposed to construct on-site work camps that would reduce construction traffic, especially during peak travel times, as fewer workers would commute daily to the site.

PCOSI noted that it was working with Sturgeon County on the development of a transportation master plan and would continue to work with the county as the plan was implemented. PCOSI noted that the plan would allow the county to better understand the local infrastructure requirements and make more informed decisions on where to invest its infrastructure funds to best meet increasing demands and safely accommodate traffic from the project.

PCOSI stated that Sturgeon County had expressed concern to it about the capability of Opal Road to handle the projected increase in traffic. In response to this concern, PCOSI indicated that it had paid taxes in advance to Sturgeon County to upgrade the portion of Opal Road north of Highway 643 and that the upgrade had been completed.

PCOSI indicated that construction of a rail spur to its project site required a crossing of Highway 643. PCOSI noted that concerns were expressed about the crossing and the impact that it might have on traffic flow on Highway 643. PCOSI testified that it would be constructing, at its own expense, a highway overpass at the rail crossing, thereby eliminating traffic delays and greatly improving safety.

PCOSI acknowledged that its project would increase rail traffic on the rail line that the Ainleys and Craggs (members of NESICL/CFRD) had to cross to access their residences. However, PCOSI stated that the new track to be built on its site would be of sufficient length to accommodate an entire train, and thus any trains arriving or departing from its site would not need to be stationary at public road crossings. PCOSI also suggested that it believed that the time of the crossings would become known, as the train schedule would be fairly regular to meet PCOSI's requirements.

PCOSI committed to work with CN Railway (CN) to influence when the movement of rail cars would occur, but suggested that rail movements related to the project were ultimately beyond its control. PCOSI stated that it would work with its rail service providers and recommend that a schedule be posted on a public Web site so that the train crossings could be anticipated.

PCOSI did not agree with the suggestion that the Board should place restrictions on project construction to allow regional infrastructure to be further upgraded.

PCOSI did not comment on Mr. Smulski's recommendations.

5.2.2 Views of Sturgeon County

Mayor Rigney indicated that at one point Sturgeon County was prepared to borrow \$35 million to ensure that adequate road infrastructure was in place in advance of the cumulative construction activity anticipated for the region. However, Mayor Rigney noted that North West and PCOSI had come forward with a total of \$20 million in prepaid taxes to upgrade the road infrastructure.

5.2.3 Views of NESICL/CFRD

NESICL/CFRD expressed concern about increased traffic congestion, additional rail traffic, and road safety. NESICL/CFRD members were specifically concerned about the impact traffic had on their farming operations, reduced road visibility due to fog from the upgrader, their ability to evacuate in an emergency, and road safety in general. NESICL/CFRD did not accept that the proposed work camp would mitigate traffic impacts, as it believed that the work camp would only shift traffic impacts from peak hours to off-peak hours.

NESICL/CFRD submitted that the existing road infrastructure was already strained; traffic accidents were above the provincial average, and increased accidents could result from the additional pressure put on roads not designed to accommodate industrial traffic.

NESICL/CFRD acknowledged that there were plans in place to upgrade the transportation corridors within the AIH. However, it was not aware of any financial commitments made to undertake the work. NESICL/CFRD suggested that plans and studies did not equate to commitments and action. NESICL/CFRD requested that the Board not allow project construction to proceed until the road infrastructure was upgraded to safely accommodate the increased traffic from the project.

NESICL/CFRD members the Ainleys and the Craggs expressed concern about the projected increase in rail traffic to the PCOSI site and the potential impact this would have on their ability to access and exit from their properties, particularly during an emergency. The Ainleys and the Craggs indicated that they could only access or exit their properties by crossing the rail track. They indicated that they were already experiencing delays at the rail crossing on average once every six weeks ranging from 20 to 45 minutes and on one occasion as much as seven hours. NESICL/CFRD submitted that its members had tried to contact Transport Canada regarding train traffic frequently blocking the road, but were unsuccessful in reaching the appropriate people. NESICL/CFRD noted that PCOSI did not offer any mitigation for the increased rail traffic as a result of its project further impacting access to their property. Ms. Cragg further indicated that she had an anaphylactic allergy to insect stings which, in the event of being stung, required her to have rapid access to a hospital. NESICL/CFRD members expressed frustration over their inability to have their concerns adequately addressed and the lack of accountability by any agency, whether it be industry, CN, or the government.

5.2.4 Views of the Shaws

The Shaws submitted that the increased traffic as a result of the industrial activity in the area was impacting their quality of life. The Shaws stated that the increased traffic would increase the chances of trespass, theft from their property, and vandalism, especially with the proposed work

camps being close to their residence. The Shaws further argued that the increased traffic would prevent them from safely walking, riding their bikes, or taking their horses on the road.

5.2.5 Views of Mr. Smulski

Mr. Smulski recommended that given the increase in traffic during construction of the PCOSI project and other concurrent project construction, companies should be encouraged to use routes from the north (Highway 38 and Highway 643) and the east (Highway 38, Highway 643, and Vinca Bridge) to distribute traffic flows. Mr. Smulski stated that given the projected high levels of traffic to and from the project site, a work camp could remove as much as 50 per cent from the projected traffic volumes.

Mr. Smulski indicated that the rail tracks immediately east (Evonik Degussa access) of PCOSI's proposed Highway 643 crossing could be used to eliminate the need for the proposed crossing. Mr. Smulski noted that communication between the various parties (CN, PCOSI, and Evonik Degussa) should be encouraged to see if this option could be incorporated into PCOSI's plans.

5.2.6 Views of the Board

The Board acknowledges that the construction and operation of the PCOSI project will add to an already noticeable increase in road traffic congestion and rail traffic in the area. The Board recognizes that the lifestyles of rural residents have been impacted, as the residents have become increasingly subjected to heavy traffic volumes, especially during peak construction periods. The Board also recognizes that the impact of increasing traffic volumes can be mitigated through advance planning and action on the part of the company and the responsible authorities (local and provincial government bodies). The Board believes that with or without work camps, the construction will result in incremental traffic that needs to be addressed. However, the Board believes that the use of work camps will result in less traffic than would be the case without camps.

Through this and other hearings, the Board is aware that the issue of traffic is front and centre for governments, the Capital Region Board, AIHA, and synergy groups active in the region. The Board finds that because issues related to traffic are regional in scope, the issues are best dealt with by involving all of the relevant stakeholders. The Board is encouraged by the level of regional planning taking place and expects PCOSI to continue its support and participation in the planning process.

To reinforce the importance of the government and other relevant parties continuing to take steps to address the road and rail traffic issue, the Board intends to bring this matter to the attention of the Capital Region Board and Alberta Transportation and will emphasize that addressing road and rail traffic should be one of their priorities in regional land-use planning.

The Board commends PCOSI for the financial support it provided to Sturgeon County to upgrade Opal Road north of Highway 643 and for its commitment to build an overpass over Highway 643, though PCOSI did not specify the timing for completion of the overpass. The Board notes that in order to minimize project effects and provide maximum benefit, the construction of the overpass should be completed prior to start-up of the upgrader.

With respect to a number of concerns raised about rail traffic, PCOSI said that rail movements related to its project were ultimately beyond its control. The Board is concerned about PCOSI's position, as rail service is an integral part of PCOSI's project proposal. The Board believes that the rail service providers operating in the region are important stakeholders and must be full participants in finding solutions that help to address concerns related to rail traffic. The Board acknowledges PCOSI's commitment to work with its rail service providers. It expects PCOSI to have a full understanding of its rail needs and, as a result, to work with the rail service providers to develop a more regular schedule of train traffic.

With respect to the Ainleys' concern about rail traffic, the Board believes that relatively short delays created by rail traffic that occur on average only every six weeks are minor inconveniences. The Board believes that a delay of seven hours is unacceptable, but notes that this kind of problem appears to have been an unusual event.

With respect to the risk that could be posed by trains blocking Ms. Cragg from obtaining attention for her medical condition, the Board believes that the matter must be recognized and addressed by PCOSI and its rail service provider in their plans. The Board will condition PCOSI's approval to require that PCOSI satisfy the Board prior to start-up of the upgrader that plans are in place to deal with Ms. Cragg's need for quick egress.

5.3 Project Location

5.3.1 Views of PCOSI

PCOSI stated that it had examined two locations for its upgrader: at its oil sands lease in the Regional Municipality of Wood Buffalo and in Sturgeon County, within the county's Heavy Industrial Policy Area (HIPA).⁴ PCOSI testified that it had decided to locate the project in Sturgeon County because the site was close to other bitumen feedstocks and other chemical manufacturers and could draw on the skilled and knowledgeable labour force that existed in the area from working on other upgrader projects. PCOSI indicated that from a business, construction, and investment perspective, it made the most sense to build its upgrader in Sturgeon County.

PCOSI agreed with the interveners that some high-quality agricultural lands were contained within the HIPA. However, PCOSI stated that Sturgeon County, in the course of making land-use planning decisions, had adopted an area structure plan (ASP) that set out its land-use priorities. PCOSI submitted that the views about agricultural land (including those of the interveners) would necessarily have to be taken into account and that Sturgeon County's elected officials made legitimate land-use planning decisions. PCOSI submitted that its proposed upgrader was consistent with the policies and requirements in the ASP.

⁴ The HIPA is that area within Sturgeon County's Area Structure Plan which is intended to accommodate heavy industry, such as petrochemical processing and manufacturing, oil and gas refining, and directly associated support service industries. The objectives of the HIPA are to accommodate heavy industry in an environmentally sound and economically efficient manner; maintain required separation and setbacks between industrial activities and other non-industrial land uses in the area, based on acceptable risk standards; encourage maintenance and incorporation of agricultural activities with the heavy industrial activities in mutually compatible and supportive ways; and minimize the residential population living in close proximity to heavy industrial operations.

5.3.2 Views of Sturgeon County

Mayor Rigney, of Sturgeon County, indicated that it was essential for Sturgeon County to capture the growth and economic opportunities that industry offered. He stated that Sturgeon County was able to capture this opportunity primarily due to the synergies offered by industry clustering together within the AIH. Mayor Rigney acknowledged that the transition away from rural/agricultural land use created conflict and controversy, but that it was necessary in order for the community to continue to grow.

Mayor Rigney indicated that the Sturgeon County ASP had been subject to public scrutiny and had been revised a total of five or six times. He noted that in the last revision a considerable amount of land was added to the area that was zoned as heavy industrial.

Mayor Rigney stated that the Council for Sturgeon County had set up an ad hoc committee consisting of Sturgeon County residents, AIHA members, and industry members to give advice on roads, water, sewer, safety, setbacks, buffers, and other issues. Mayor Rigney noted that committee members expressed some concerns that not all of their recommendations were addressed.

Mayor Rigney stated that Sturgeon County was part of the Capital Region Board. He indicated that work had started under the Draft Land-use Framework issued by Alberta Sustainable Resource Development (SRD) to address what was needed to develop a regional plan.

5.3.3 Views of NESICL/CFRD

NESICL/CFRD expressed concern about the changing nature of land use in the region as a result of the AIH and the encroachment of heavy industry in an area that was traditionally agricultural.

NESICL/CFRD stated that the proposed site for the upgrader was on prime agricultural land and suggested that it was unethical for the project to remove a large area of increasingly scarce agricultural land from food production and replace it with a bitumen upgrading facility. NESICL/CFRD noted that PCOSI considered only two alternative locations for the project and suggested that the Board should require PCOSI to locate the project on poorer quality soils in the more sparsely populated areas that were abundant to the north and east of the proposed site.

NESICL/CFRD submitted that it did not have confidence in Sturgeon County's land-use decision-making. It suggested that Sturgeon County would continue to change the zoning to accommodate industry just to gain the higher tax base industry offered relative to agriculture. NESICL/CFRD believed that Sturgeon County did not respect the viewpoint of the agricultural community in its land-use decisions, nor did it have an appreciation of what agriculture meant to the community. NESICL/CFRD noted that while the ad hoc committee engaged in numerous discussions on roads, water, sewer, safety, setbacks, buffers, and other issues, Sturgeon County did not act on some of the committee's recommendations.

NESICL/CFRD asked that the Board give consideration to the Government of Alberta's Land-use Framework initiative and the government's stated policy within that framework to reduce fragmentation and conversion of prime agricultural farmland.

5.3.4 Views of the Board

The Board recognizes that land-use planning decisions take place within a public forum. The Board notes that the Sturgeon County ASP specifically speaks to the planning process, the ad hoc committee, and the public engagement process. The Board notes that the county's ASP has goals and objectives for each of the Environmental, Heavy Industrial, Heartland Agricultural, and Heartland Industrial Service Centre policy areas within the ASP. The Board notes that the proposed site for the PCOSI upgrader lies within the HIPA. In accordance with the ASP, the intent of the HIPAs is to accommodate heavy industry, such as petrochemical processing and manufacturing, oil and gas refining, and directly associated support service industries. The Board finds that PCOSI's proposed project is consistent with the objectives of the HIPA and therefore finds that there is no compelling reason to require PCOSI to consider an alternative location for its project.

The Board also notes the request that it should give consideration to the draft Provincial Land-Use Framework. The Board is aware of the framework, including the six regions, the six key strategies, and the cumulative effects management approach set out within the framework. The Board is also aware that it is the intent of the framework to respect personal property rights and the decision-making authority of local governments. The Board believes that the framework will provide needed guidelines for land-use planning and decision-making in the Capital Region, including Sturgeon County, which will better balance the environmental, social, and economic needs of the region, recognizing that there are additional industrial development projects planned for the area. The Board notes, however, that, at the time of the hearing the framework was in draft form and that it would be inappropriate for the Board to apply any of its provisions.

5.4 Buffer Zone

5.4.1 Views of PCOSI

PCOSI submitted that the tank farm and processing facilities for the proposed upgrader would be located at least one mile, or approximately 5000 feet, from the Groots' residence. PCOSI indicated that this was significantly greater than the 1500 foot buffer zone established pursuant to the Sturgeon County ASP.

5.4.2 Views of NESICL/CFRD

NESICL/CFRD expressed concern that the size of the required buffer zone between agricultural lands and industrial lands, as determined by Sturgeon County, was insufficient. NESICL/CFRD indicated that the county regulations stated that heavy industry only needed a 1500 foot buffer zone, but suggested that a much larger buffer was necessary.

Mr. Groot indicated that his residence was situated less than one-half mile from the PCOSI property line. Mr. Groot believed that PCOSI was using his land as a buffer from his dwelling. Mr. Groot suggested that the proposed upgrader should be located no closer than two miles from his residence.

5.4.3 Views of the Board

The Board notes that Sturgeon County, through its ASP, has established a 457 m (1500 foot) separation distance (buffer zone) between the wall or edge of the nearest heavy industrial facility on a heavy industrial site to the outside wall or edge of a residential dwelling. The Board also notes that the buffer zone was established in accordance with Major Industrial Accident Council of Canada criteria for acceptable levels of industrial risk and that the distance is subject to further increase based upon the risk assessment that the county requires as part of the development application process for heavy industrial uses. As a result, the Board is satisfied that the buffer zone of 5000 feet established by PCOSI between the Groots' residence and the upgrader is not only sufficient, but significantly exceeds county requirements. Further, the Board notes that while NESICL/CFRD asserted that the county's buffer requirement was insufficient, it provided no evidence to demonstrate what an appropriate buffer should be. Similarly, Mr. Groot asserted that the upgrader should be located no closer than two miles from his residence but provided neither a basis for his assertion nor reasons why the 1500 foot buffer or 5000 foot buffer would be insufficient.

5.5 Voluntary Property Purchase Program

5.5.1 Views of PCOSI

PCOSI acknowledged that the basic incompatibility of large industrial facilities with residential land use in the region would be intensified with the addition of its project. PCOSI concluded that a possible mitigation measure was to offer to relocate people from the area through the Voluntary Property Purchase Program (VPPP).

PCOSI stated that it acquired nine sections of land that it needed for the project and future expansion through a land agent that dealt directly with the landowners. It stated that the company did not rely on the VPPP.

PCOSI explained that it was a member of the VPPP but that it did not have a direct role in its operation. PCOSI indicated that it was not aware of how decisions were made by the VPPP, nor was it certain about who was eligible for the program or which landowners received priority under the program. PCOSI noted that it was aware of the general lack of funding, given the number of applicants to the program. It understood that VPPP management was seeking further funding, particularly from the Alberta Government. PCOSI suggested that as more industry located in the area, there would be further funding provided to the VPPP by industry.

PCOSI indicated that a strategic review of the VPPP was under way and expected that by fall 2008 the VPPP would have the benefit of a new strategy. PCOSI also indicated that the VPPP would be accepting new applications in the fall. PCOSI, upon approval of its proposed project, committed to continue its participation in the VPPP and to provide financial support.

5.5.2 Views of Sturgeon County

Mayor Rigney stated that he was involved from the beginning in setting up the VPPP to fairly compensate people who wanted to move away from what they considered to be the adverse effects of large-scale industrial development. Mayor Rigney agreed that there remained some issues with respect to the functioning of the VPPP. However, he noted that what the VPPP had

achieved to date was only the first step. Mayor Rigney suggested that people could take comfort in the fact that the VPPP was in place and that it was able to accommodate a number of residents who wanted to relocate from the area. Mayor Rigney noted that by adding more land to the AIH when the ASP was last revised would allow more residents that were previously outside of the heavy industrial zone to be considered under the VPPP.

5.5.3 Views of NESCIL/CFRD

NESCIL/CFRD submitted that the VPPP lacked transparency and consistency and noted that the current program was dependent upon the goodwill of industry. NESCIL/CFRD suggested that the program's future was in doubt without a significant commitment of financial resources by industry. NESCIL/CFRD requested that the VPPP be subject to an external, independent effectiveness audit.

NESCIL/CFRD landowners pointed to past decisions of the Board⁵ wherein the Board recognized the land-use conflict and was sympathetic to the quality-of-life concerns raised by local residents. NESCIL/CFRD noted that ten years had passed since these decisions were released, yet the quality of life of its members continued to be negatively affected by heavy industry locating in the area. NESCIL/CFRD requested that PCOSI's application should not be approved and reiterated the Board's findings in *Decision 99-8* that "full industrial development of the area is ultimately not acceptable without relocation of the residents in the area."

5.5.4 Views of the Shaws

The Shaws stated that if a landowner had an application before the VPPP, the application would be put on hold if the landowner filed a statement of concern or intervened in a project application proposed within the AIH. The Shaws indicated that this put the landowner at a disadvantage and a landowner who continued to object to a project was ineligible for the VPPP.

5.5.5 Views of Dr. Hoehn

Dr. Hoehn indicated that he was directly and substantially impacted as a resident and landowner whose property was located 3 km northeast of the proposed site and within the AIH. Dr. Hoehn indicated that the cumulative industrial development taking place near his home was affecting his family's quality of life. He indicated that concerns about health hazards, safety, and security risk had reached the point that he no longer wished to live in the area and had no choice but to move.

Dr. Hoehn noted that he had tried to sell his property for over a year by working with a well-established real estate agent, but there had been no interest expressed in his property. Dr. Hoehn stated that the VPPP represented one possible vehicle to sell his property; however, he indicated that if he applied to the program, he would be put on a waiting list. He suggested that his property would likely not be at the top of the priority list and therefore, it could take three or four years before his property would be eligible under the program. Dr. Hoehn expressed concern about the efficiency of the VPPP process and the lack of funding for the program. Dr. Hoehn

⁵ *Decision 97-7: Dow Chemical Canada Inc., Application to Amend Industrial Development Permit No. IDP 92-1, Fort Saskatchewan, June 12, 1997, and Decision 99-8: Shell Canada Limited, Applications to Construct and Operate an Oil Sands Upgrader and Amend Refinery Approval, Fort Saskatchewan, April 6, 1999.*

recommended that PCOSI's project proposal should not be allowed to proceed until a more proactive and generous VPPP was established that served both residents and owners of vacant land, so that anyone who lived in the AIH had the option of being bought out and could leave the area if they wished.

5.5.6 Views of the Board

The Board notes that PCOSI was able to assemble nine sections of land for its project site completely by negotiation, without the need to use the VPPP.

Having regard for the existing and proposed industrial development in the AIH, including projects announced but not yet applied for, the Board agrees that people should be able to leave the area if they choose to and that this is the best solution to the incompatibility between heavy industry and other kinds of development in the region, such as agriculture.

The Board notes that although all of the AIH has been zoned as heavy industrial by the county, there remain a few families engaged in agricultural operations that are close by and have the greatest likelihood of being subjected to the impacts of the proposed upgrader. Notwithstanding that the residences are beyond the 1500 foot buffer from industry established by the ASP, the Board has the most concern about those families in terms of the potential for them to be impacted, because they are closest to the project. The Board recognizes that there are other families in the region who have expressed concern, but considers there to be less potential for them to be impacted because they are much farther away.

Dr. Hoehn was very clear about his desire to leave the area. The Shaws and Mr. Smulski seem to want to remain in the area, even if the upgrader goes ahead. Similarly, the Groots appear to want to remain in the area. The Board believes the potential for these residents to be impacted would be obviated, and the need for certain special conditions would be eliminated as well, if the residents were provided a reasonable opportunity to leave the area. The Board notes that these families are within the AIH heavy industrial area and that if the lands to the west of PCOSI's site were contemplated for an upgrader or similar development, they would essentially be surrounded by large industrial complexes.

It is the Board's view that companies that wish to locate in the AIH must give greater consideration to providing residents with a reasonable opportunity to leave the area, whether through direct negotiation or by enhancing the VPPP. The Board believes that direct negotiation for purchase of a property is likely a better option (in light of special conditions that may be imposed), notwithstanding that a residence may be beyond the 1500 foot buffer established by the ASP.

The Board notes the comments of Mayor Rigney that what the VPPP has achieved to date was only the first step. It also notes the comments of other interveners that the VPPP program is inflexible and underfunded, given the level of demand for the program. The Board considers that the VPPP represents an important mechanism for dealing with residents who want to relocate when their lands are not in demand by industry. It also believes that the industrial developers, local government, and the provincial government have an interest in the success of the VPPP program. The Board is encouraged that a strategic review of the VPPP is under way, including funding. The Board would expect that the review would have regard for the existing, proposed, and future industrial development that might occur in the AIH.

5.6 Work Camps

5.6.1 Views of PCOSI

PCOSI stated that there was a shortage of available skilled labour in the region and, as a result, it would have to recruit workers from outside the local area. PCOSI stated that a work camp was essential if it was to attract the labour it required. The absence of an on-site work camp would act as a barrier to employment and adversely impact PCOSI's ability to secure the labour necessary to construct the upgrader. PCOSI stated that an on-site temporary work camp was an essential component of its construction strategy and that if an on-site work camp could not be used, the economic viability of the upgrader could be put at risk.

PCOSI argued that the use of temporary work camps was an effective mitigation measure that would reduce the potential impacts on the local community of the influx of a mobile construction force. PCOSI stated that on-site work camps would provide a focal point for resident concerns and would make these concerns more amenable to management and mitigation than if the workers were spread out in the community.

PCOSI committed to consult with local residents and service providers (medical, police, fire) as further details of its work camps became available in order to ensure that resident concerns were addressed, impacts were mitigated, and all parties were well informed about the facilities that would be available on site.

PCOSI stated that it planned to construct four construction camps to house up to 3000 workers. Two camps would house 1000 workers each and two would house 500 workers each. Each camp would offer a range of recreational and entertainment facilities, as well as a convenience store. The location of the camps was influenced by several factors, including the need to be in close proximity to the construction sites.

Sewage from the camps would be stored in enclosed tanks and shipped to an on-site disposal facility. This disposal facility would be connected to the municipal sewage system. Potable water would be delivered to the camps from an on-site fill facility connected to the county's potable water system. As a result, there would be minimal off-site traffic associated with water and sewage. It was PCOSI's understanding that the Sturgeon County sewage system had sufficient capacity to accommodate the sewer output expected from the work camps.

PCOSI stated that it would ensure that adequate waste facilities were in place so as to decrease the likelihood of there being any litter. In addition, it would monitor the site and fence lines on a regular basis to keep the site relatively free of litter. Finally, each camp would be surrounded by a six-foot-high fence. These fences would contain any litter that did exist.

PCOSI stated that there would be designated outdoor smoking areas equipped with benches, ashtrays, and fire extinguishers to control smoking and to enhance a rapid response in case of fire. These smoking areas would likely be located on pavement or gravel, not grass. In the very unlikely event of a grass fire, there would be adequate firefighting equipment located at the site to deal with this.

PCOSI stated that the camps would have licensed lounges so that its workers would not have to leave the camp. PCOSI believed that establishing a lounge within the camp was a good idea, as it provided greater control and kept workers off the roads.

PCOSI stated that there would be on-site security personnel in each camp providing 24-hour-per-day, 7-day-per-week coverage. All camp residents would be required to check in and check out through a single access control point at each camp. PCOSI stated that it had applied to the county to close all interior roads on its property so as to restrict access to the work camps and construction sites to Highway 643.

Regarding drugs, PCOSI stated that there would be regular searches for drugs in support of enforcing the camp alcohol and drug policy, which would be based on the Construction Owners Association of Alberta (COAA) Alcohol and Drugs Guideline and Work Rule. When people joined the workforce they would be tested for various drugs. If they tested positive, their employment would be immediately terminated. PCOSI stated that it would also have drug testing after safety incidents.

PCOSI stated that it could not perform background checks on workers residing in Canada without their consent, nor could it compel individuals to provide their consent. However, background checks would be done on security staff. If temporary foreign workers were used, these individuals would have to submit police clearance certificates as part of Canada's Temporary Foreign Workers Program before they would be permitted to enter Canada. The program would screen out potential workers with criminal backgrounds.

PCOSI stated that it had had numerous discussions with the RCMP, and based on the available data, it was unable to find any statistical link or indication that mobile workers were more or less prone to criminal activity than the general population. PCOSI stated that it was committed to reducing the impacts on local stakeholders and that it would work with local stakeholders, including local law enforcement, to ensure that the security of its neighbours was not affected by its camp residents.

PCOSI stated that it had had discussions with staff at the Capital Health Region, who indicated that they did not anticipate that the numbers of camp workers would have an undue impact on the health system.

PCOSI stated that it would provide workers with a common medical facility located inside the construction perimeter fence that would service all employees and contractors. In addition, health centres would be established for each work camp and include staffing by a registered nurse. PCOSI acknowledged that it did not yet have all of the details with respect to the medical services that would be available at the construction camps. However, PCOSI stated that it would retain an experienced camp medical service provider who would make the final determination as to the nature and extent of medical services to be provided at each camp. PCOSI stated that it would comply with all Occupational Health and Safety requirements.

5.6.2 Views of the Shaws

The Shaws expressed concerns regarding the impacts that PCOSI's proposed work camp would have on their quality of life. The Shaws questioned if the Board could guarantee their safety, security, and that the nuisance from living adjacent to PCOSI would not become unbearable.

The Shaws noted that PCOSI's proposed work camp would put additional stress on local infrastructure, including the RCMP, hospital, ambulance, and fire services. They expressed concern about the lack of detail available from PCOSI regarding the footprint of the work camp, access and egress points, noise emanating from the camps, on-site ambulance services, the timing of the camp construction, and the infrastructure necessary to service them. The Shaws requested the Board to ensure that PCOSI provided them with the necessary details and not simply approve the project based on various promises that PCOSI may or may not fulfill.

The Shaws noted that PCOSI had not proposed a method of preventing workers who had imbibed in camp from getting in their cars and driving off the site and onto local roads, that PCOSI did not have a zero tolerance policy for any crime committed on its site, and that PCOSI was not prepared to accept responsibility for the actions of its workers when off site.

The Shaws stated that the RCMP had limited resources, but noted that in accordance with PCOSI's own data, all things being equal, a possible 226 additional crimes could be committed in the area as a result of the increase in population from the construction camp. The Shaws provided a letter from the Redwater RCMP detachment that indicated that 5 additional full-time officers and 1.5 support staff would be required to deal with the impacts of the proposed work camp.

The Shaws acknowledged PCOSI's work site smoking policy but stated that they were still concerned about workers throwing lit cigarette butts out of their vehicle windows onto the local roads and ditches and the potential this created for hazardous grass fires.

The Shaws stated that they shared a fence line with PCOSI and that litter from the site, in particular plastic bags, would be fatal if ingested by their calves. While the Shaws acknowledged that PCOSI had committed to monitor the fence line, they questioned their recourse if PCOSI's proposed monitoring program did not prove effective.

The Shaws suggested that the following mitigation measures be implemented if the project were approved:

- a significant increase in the number of RCMP officers staffed out of the Redwater detachment;
- closure of Range Roads 221 and 222 north of Township Road 564;
- hourly fence line monitoring for litter;
- background checks by PCOSI of proposed workers and screening out those with histories of crimes against persons and property, as well as those convicted of drug offences or drinking and driving offences within the previous five years;
- prohibition of any driving off site if a worker had been drinking at all during off hours;

- a restrictive (in terms of place) smoking policy on site;
- demonstration of capacity to deal with a major grass fire;
- increased capacity for local and regional medical infrastructure (including patient transport); and
- increased capacity for local and regional fire fighting facilities.

5.6.3 Views of NESICL/CFRD

NESICL/CFRD questioned the need for the work camp in light of the major slowdown in the region resulting in less demand and competition for workers. NESICL/CFRD argued that if there was not a need for a construction camp when PCOSI was completing its EIA at a time when 8 to 12 upgrader projects were being proposed for the region, how could there be a need for a construction camp today when projects have been cancelled and put on hold?

NESICL/CFRD expressed concerns regarding the impacts of the proposed work camps and questioned how the Board could find the camps to be in the public interest when PCOSI had not engaged in adequate consultation; PCOSI could not prevent its workers from drinking and driving; traffic congestion would increase during off peak hours; the demand on local health care services, which were already strained, would increase; crime would increase; and the security of property and safety on the highways were at risk.

To mitigate the impacts of the construction camps, NESICL/CFRD suggested that if the Board were to approve the camps, the Board may wish to condition PCOSI's approval to require it to

- establish a health centre at each camp staffed by a registered nurse that would be available 24 hours a day;
- ensure that ambulances were available on site; and
- develop a protocol to restrict workers from leaving the camp lounge and then driving into the local community.

NESICL/CFRD cited a number of newspaper articles and excerpts from the Radke report⁶ that indicated that work camps and the transient worker population would increase the crime rate, traffic accidents, assaults and drug issues, traffic congestion, demand for medical services, and policing issues in the surrounding communities.

NESICL/CFRD argued that there was a great deal of uncertainty with respect to the details of the work camps. NESICL/CFRD noted that PCOSI had provided only a general sense of where the camps would be located. The exact number of workers that would ultimately be housed was unknown, and as a result the impacts on the community could not be properly assessed. Details with respect to the health services that would be provided, including the number of ambulances, were lacking. No information was provided on the number of personal vehicles which would be permitted. Fire fighting services had not been designed. And while PCOSI admitted there would be negative impacts, these impacts had not been analyzed, quantified, or documented.

⁶ Exhibit C10: Government of Alberta, Oil Sands Ministerial Strategy Committee, *Investing in Our Future: Responding to the Rapid Growth of Oil Sands Development Final Report*, December 29, 2006.

NESCIL/CFRD argued that the aggregate impacts of the camp on the surrounding communities would be negative and that dispersing workers into the surrounding communities would have less of an impact than the work camps. NESCIL/CFRD submitted that the Board should deny the camps. In the alternative, NESCIL/CFRD argued that the application should be deferred until the work camps were subject to a comprehensive environmental and socioeconomic impact assessment.

5.6.4 Views of the Board

The Board acknowledges that the influx of 3000 construction workers will have an impact on the communities surrounding PCOSI's proposed upgrader regardless of whether they are housed in construction camps on PCOSI's lands or they are dispersed throughout the region. The Board finds, however, that in aggregate these impacts can be better managed and mitigated if workers are housed in work camps.

The Board believes that the principal concerns of residents relate to the impacts of the work camps on the ability of local medical services to meet the expected increase in demand, the ability of local policing services to address the expected increase in crime and to ensure resident security and safety, and workers' drinking and driving behaviour.

With respect to policing matters, the Board notes that the Redwater RCMP detachment has indicated that it will require additional resources in order to meet the policing needs arising from the influx of workers. However, the Board also notes that the Redwater RCMP detachment has outlined the process by which additional officers can be obtained and expects that PCOSI will work with local law enforcement and Sturgeon County to ensure that adequate financial and manpower resources are available to meet policing needs when the construction camps become operational.

With respect to medical services, including ambulances, the Board notes that PCOSI will be providing services at its construction sites, as required by Occupational Health and Safety legislation, as well as in the work camps. The Board acknowledges that at this time the specific medical services that PCOSI will provide at its work camps are not fully defined. The Board notes, however, that PCOSI has had discussions with Capital Health Region representatives who have indicated that they did not expect the number of camp workers to have an undue impact on the health system. While the Board is prepared to accept this conclusion, it nonetheless expects PCOSI to continue to work with the Capital Health Region and to design its camp medical services in consideration of the concerns and recommendations expressed by residents.

With respect to drinking and driving, the Board acknowledges that PCOSI has no control over how its employees behave when off site. Nonetheless, the Board expects PCOSI to adopt and enforce a strict zero tolerance drinking and driving policy for workers both leaving and returning to the work camps.

With respect to the additional concerns raised by the Shaws, the Board notes that PCOSI will conduct fence line monitoring for trash accumulation and that PCOSI has committed to conducting a grass fire exercise. The Board notes PCOSI's smoking arrangements and expects PCOSI to also educate its workers on the dangers of throwing live cigarettes onto roads and ditches.

The Board recommends to Sturgeon County that if it were to establish bylaws respecting work camps, the bylaws should give consideration to the Board's expectations of PCOSI regarding the provision of police and medical services and policies regarding drinking and driving, and smoking and driving.

The Board accepts that PCOSI will conduct background checks on its employees to the extent that it is allowed to by the law.

The Board notes that PCOSI has applied to close all municipal roads within its property and will restrict access to its property from Highway 643 only. The Board finds that this will reduce the potential for traffic on local range and township roads.

6 SAFETY

6.1.1 Views of PCOSI

Emergency Response Planning

PCOSI stated that as part of its application, it filed a corporate emergency response plan (ERP) in accordance with ERCB *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*. PCOSI stated that it would prepare a site-specific ERP beginning in the fall of 2008, with completion scheduled for mid-2009. PCOSI stated that its site-specific ERP would meet the requirements of both *Directive 071* and the Canadian Standards Association's *CSA-Z731-03: Emergency Preparedness and Response*. PCOSI committed to file its site-specific ERP with the Board upon completion. PCOSI also committed to ensure that any third-party facilities constructed as part of the project adhered to the same ERP standards and that third-party ERPs would be integrated within the overall site ERP.

PCOSI noted that it would also be preparing a construction ERP and committed to meet with stakeholders in September 2008 to review a draft of this plan. PCOSI committed to make the final plan available to the public prior to the beginning of construction and stated that it would be modified to address issues associated with the temporary work camps. These issues would include establishing evacuation procedures, muster points, and emergency signals. PCOSI also stated that it was developing a hazard assessment for the proposed project and indicated that this assessment would be completed shortly.

PCOSI acknowledged the concerns expressed by residents regarding emergency response planning. PCOSI stated that it was committed to ensuring that its proposed upgrader would be subject to an effective, comprehensive, and thorough ERP and that it was committed to ensuring that its neighbours would have an opportunity to review the ERP and have input on how the ERP, including community call-out procedures, could be improved.

PCOSI noted that NESICL/CFRD had requested that PCOSI conduct a full-scale emergency response exercise based upon a worst-case scenario during the first three months of operation and that the results of the exercise be made public. PCOSI acknowledged the importance of such an exercise but argued that its facility would not be fully operational or fully manned during this

start-up period. It committed instead to undertake a full-scale exercise within the first 12 months of operation. PCOSI also committed to conduct a table-top exercise before start-up.

With respect to the concerns raised by the Shaws, PCOSI committed to involve them in the preparation of the site-specific ERP and in reviewing the results of the ERP exercises. PCOSI also agreed to provide the Shaws with training in emergency response preparedness and committed to conducting an emergency response exercise to demonstrate its capability at fighting grass fires.

Northeast Region Community Awareness and Emergency Response

PCOSI acknowledged the concerns raised by residents with respect to the apparent deficiencies in the Northeast Region Community Awareness and Emergency Response (NR CAER) Community Notification System.⁷ PCOSI committed to work with NR CAER and the community on their suggestions to develop an appropriate emergency notification system.

PCOSI acknowledged the residents' concerns that if they could see it, hear it, or smell it, they wanted to know about it within 15 minutes. PCOSI believed that it was the responsibility of plant operators to inform local residents of any issues or potential operation problems, such as off-site odours. Further, PCOSI stated that if residents had any concerns about specific plant operations, they should contact the plant in question directly.

6.1.2 Views of NESCIL/CFRD

Emergency Response Planning

NESCIL/CFRD expressed concern that PCOSI had not completed a hazard assessment or a site-specific ERP for its proposed upgrader project. NESCIL/CFRD noted that PCOSI had also not completed an evaluation of worst-case scenarios. NESCIL/CFRD questioned how the Board could approve the application given the lack of this information

NESCIL/CFRD was concerned that PCOSI had not consulted with residents to discuss their particular needs. Some residents were particularly concerned about rail traffic blocking their ability to evacuate the area in the event of an emergency. Residents were concerned about not only their own evacuation, but also the evacuation of their pets and livestock.

NESCIL/CFRD's consultant noted that based on information provided by PCOSI, the ERP needed to take into account major fires and explosions, toxic clouds from sulphur pile fires, and release of hydrogen sulphide (H₂S) from the process. Other hazards could arise from the handling of waste products, such as catalyst or specific process materials like hydrogen fluoride and sulphur dioxide (SO₂), chlorine, or ammonia.

⁷ NR CAER is a partnership of more than 40 industries, municipalities, chemical transporters, and government agencies dedicated to emergency response and safety education initiatives in the industrial region northeast of Edmonton. The NR CAER Community Notification System consists of the UPDATELine, a toll-free, 24-hour telephone information line that residents can call to obtain recorded information on industrial activities, as well as information on more serious situations; and an automatic call-out system for contacting residents in an emergency situation.

Some residents had little faith in PCOSI's ability to develop an effective ERP based on their experiences with other industries in the region.

NESCIL/CFRD requested that the Board require PCOSI to have a fully developed ERP, to be able to demonstrate to the community that it had considered all types of emergencies, and to show that it was able to respond to them.

Northeast Region Community Awareness and Emergency Response

NESCIL/CFRD argued that the NR CAER Community Notification System that PCOSI proposed to use as part of its ERP was unacceptable as NR CAER had not been reliable. NESCIL/CFRD stated that there was no one at NR CAER to ensure that emergency contact numbers for residents were updated and accurate. NESCIL/CFRD stated that the system had difficulty contacting residents quickly and that it took too many hours for calls to get out. NESCIL/CFRD was concerned that there was also a lack of information about events and that information was no longer accurate by the time it finally reached residents. NESCIL/CFRD stated that it was important for residents to know whether they should shelter in place or evacuate. NESCIL/CFRD noted that in NR CAER's own submission to Industry Canada, its protocol stated: "In all situations, members are required to record a message on the update line and continue to provide updates or evaluate/expand communication as the situation dictates. The goal is to record the initial message on the Update Line within 15 minutes of becoming aware of the activity."

NESCIL/CFRD submitted that another upgrader should not be added to the area until the system was fixed. It expressed frustration at dealing with NR CAER in the past and believed that its concerns had not been addressed. NESCIL/CFRD argued that if they could see it, hear it, or smell it, they wanted to know about it, and they wanted to know about it within 15 minutes.

NESCIL/CFRD expressed concern about off-site odours that could result from the operation of the proposed plant. NESCIL/CFRD members stated that they did not feel comfortable with the suggestion by PCOSI to call its facility if an odour was detected. They suggested that PCOSI should develop a protocol in conjunction with area residents for how odour complaints were to be logged and handled.

6.1.3 Views of the Shaws

Emergency Response Planning

The Shaws were concerned that PCOSI had not developed a site-specific ERP. They were also concerned about the potential for grass fires as a result of the proximity of PCOSI's proposed work camp and the possibility that PCOSI's workers would discard live cigarette butts while driving on local roads.

The Shaws requested that they be fully involved in PCOSI's development of its site-specific ERP and that their knowledge of the region be incorporated into it. They also requested that they be involved to a level to which they felt satisfied in any tests of the ERP and that they be given training in emergency response procedures.

6.1.4 Views of Mr. Smulski

Emergency Response Planning

Mr. Smulski noted that his property shared boundaries with the North West upgrader project and PCOSI's proposed upgrader project. As a result, Mr. Smulski noted that there was only one route for him to exit his property: north on Range Road 220, then east on Township Road 564 to Highway 643. Mr. Smulski noted that this limited egress from his property could be a problem if an incident occurred at PCOSI's proposed upgrader and if an accident occurred at North West's or Agrium's facilities.

Mr. Smulski noted PCOSI's commitment to work with local residents in developing its site-specific ERP and stated that he believed that PCOSI would honour its commitments. As a result, Mr. Smulski stated that he was comfortable in continuing his discussions with PCOSI outside the hearing. However, Mr. Smulski wanted the Board to note that his discussions might also involve North West.

6.1.5 Views of the Board

Emergency Response Planning

The Board acknowledges resident concerns with respect to PCOSI's lack of a site-specific ERP as part of its application. The Board notes that under Section 8 of the *Oil Sands Conservation Regulations*, an operator of an oil sands site must submit an ERP to the Board when requested. The Board notes that PCOSI has filed a corporate-level ERP with the Board that is consistent with the emergency response requirements of *Directive 071*. The Board recognizes that while a site-specific ERP would be desirable, the design of the proposed project at the time of application may not be sufficiently advanced to allow for a meaningful site-specific ERP to be developed as part of the application.

The Board acknowledges PCOSI's commitment to have full resident participation in the development of its construction and site-specific ERPs and that PCOSI's ERP will be compliant with *CSA Z731-03*. The Board is satisfied that PCOSI's adherence to *Directive 071* and *CSA Z731-03*, as well as its ERP experience at its Edmonton refinery, will allow PCOSI to develop a site-specific ERP that will be protective of the public.

The Board acknowledges PCOSI's commitment to conduct a table-top emergency exercise prior to start-up, as well as its commitment to conduct a full-scale emergency exercise based upon a worst-case scenario within the first 12 months of operation. The Board finds, however, that start-up of a facility as large and complex as an upgrader presents its own unique situations that may require an emergency response, and as such the Board expects PCOSI's response capabilities to be fully operational during start-up. Therefore, the Board will condition PCOSI's approval to require it to conduct a full-scale emergency response exercise based on a worst-case scenario prior to start-up.

Northeast Region Community Awareness and Emergency Response

The Board acknowledges PCOSI's commitment to work with NR CAER and the community to develop an appropriate emergency notification system. However, the Board notes that the concerns expressed by residents are similar to those raised in previous hearings. The Board is concerned that an important component of an effective ERP does not appear to be functioning in accordance with the expectations of those most directly affected by it, the residents, and that this problem remains an outstanding, serious public concern. While the Board recognizes that this is not an issue that PCOSI alone can resolve, the Board believes that it is nonetheless appropriate to condition PCOSI's approval to require PCOSI to submit a report prior to start-up on how the NR CAER system has been revised to deal with resident concerns. While the Board recognizes that it does not have jurisdiction over all of the entities involved with NR CAER, the Board intends to contact NR CAER to determine if there are additional steps that can be taken area wide to address resident concerns.

The Board understands that despite all the best design features and good operational management, there is a potential for off-lease odours to occur. The Board is of the view that the public who could be affected by odours from the facility should be given a clear and direct protocol from industry of what to do when they detect an odour. As a follow-up to an odour complaint, the Board believes a company must provide an explanation to the public about the incident and what they are doing to prevent further incidents and incorporate feedback from the public on how the protocol could be improved. The Board accepts NESICL/CFRD's recommendation that PCOSI be required to develop an odour complaint protocol. Therefore, the Board will condition PCOSI's approval to require PCOSI to submit prior to start-up the odour complaint protocol it will use at its facility.

7 AIR

7.1 Air Emissions and Modelling

7.1.1 Views of PCOSI

PCOSI stated that air emissions from its facility would not have adverse impacts on the public or the environment. PCOSI acknowledged that AENV had proposed Air Management Framework emission targets for SO₂ (28 000 tonnes per year [t/y]) and nitrogen oxides (NO_x) (25 000 t/y) in the AIH to address the cumulative effects of development, but believed that these emission limits had yet to be finalized. Regardless at what levels the targets were finalized, it was aware that it would be required to operate within these targets. PCOSI stated that it would minimize SO₂ and NO_x emissions using the principles of best available technology economically achievable (BATEA).

PCOSI stated that it would minimize its SO₂ emissions by designing its sulphur recover complex for 99.9 per cent sulphur recovery efficiency and requested that any approval from the Board should stipulate a minimum calendar quarter-year sulphur recovery of 99.5 per cent. PCOSI also requested that its approval be conditioned to achieve the approved sulphur recovery within 12 months of start-up. PCOSI noted that its heaters and boilers would be fired with natural gas and plant fuel gas that would be sweetened to achieve a sulphur content of less than 50 parts per

million. PCOSI was actively studying third-party processing as a way of reducing SO₂ emissions from fuel gas combustion.

PCOSI stated that it would minimize its NO_x emissions by installing selective catalytic reduction (SCR) technology on its largest NO_x source, the steam methane reformer (SMR) furnace. The SCR would reduce site-wide NO_x emissions by 30 per cent in Phase 1. PCOSI stated that it would operate the SMR as a backup in Phase 2. PCOSI stated that all other major furnaces, including the coker heaters, the diluent recovery furnaces, and the cogeneration units, would be designed with SCR or flue gas recirculation (FGR) retrofit capabilities or equivalent systems. As a minimum, NO_x emissions would be lower than that required by the current Canadian Council of Ministers of the Environment (CCME) guidelines.

PCOSI committed to various design and operational practices to reduce fugitive emissions, including vapour recovery on sour tanks, low emissivity valves, and double pump seals. PCOSI also committed to implementing a leak detection and repair (LDAR) program that, as a minimum, would meet the CCME Environmental Code of Practice for the Measurement and Control of Fugitive Volatile Organic Compounds (VOC) Emissions from Equipment Leaks. PCOSI would not commit to using differential absorption light detection and ranging (DIAL) techniques, because it did not believe it would be beneficial to its LDAR program. PCOSI stated that it would consider using an infrared camera to detect hydrocarbon leaks as part of its LDAR program. PCOSI believed that an LDAR program would likely be a requirement of its *EPEA* approval.

PCOSI committed that all tanks would meet the CCME Environmental Guidelines for Controlling Emissions of VOC from Above Ground Storage Tanks. PCOSI committed to install vapour recovery on all tanks storing sour products but it did not commit to install vapour recovery on its other tanks. PCOSI stated that tanks that were in light sweet service would have internal floating roofs to control vapour emissions.

PCOSI stated that although the proposed upgrader would emit NO_x and VOCs, which were precursors to ground-level ozone formation, the project's contribution would be low compared to overall airshed emissions. As a result, the potential for measurable contribution from the PCOSI upgrader to ground-level ozone formation would be negligible. PCOSI noted that NESICIL/CFRD's expert, Dr. Blake, thought the decision to install SCR in the SMR furnace in Phase 1 was a positive in relation to reducing ozone formation potential. PCOSI noted that the AIH was part of the Edmonton Census Metropolitan Area (CMA), which had been required to develop an air quality management plan to ensure that ozone levels did not exceed the Canada Wide Standard in the future. PCOSI stated that it would work with AENV to ensure that its LDAR program met regulatory requirements under the air quality ozone management plan.

PCOSI submitted that it had completed a detailed air dispersion modelling assessment in support of its application. PCOSI stated that it would be using SMR and liquids gasification to produce hydrogen for the upgrader. PCOSI acknowledged that it would be using SMR in Phase 1, while Phase 2 would use liquids gasification as the primary technology, with SMR as backup. While PCOSI acknowledged that it might ultimately choose to use SMR to produce hydrogen in Phase 2, the liquids gasification case would result in higher site-wide emissions from an air emissions standpoint and that was what its application was based upon. PCOSI also stated that the assessment included a cumulative effects assessment that considered all existing, approved, and

proposed projects in the AIH, including other future upgraders that had been publicly disclosed. PCOSI argued that there was no evidence that called into question its modelling assessment and that NESCIL/CFRD's expert Dr. Du concluded that for the most part the modelling was done properly.

PCOSI noted that Dr. Du claimed that it had underestimated emissions of pollutants such as benzene, 1,3 butadiene, and formaldehyde by a factor of 13.45. PCOSI understood that the basis for Dr. Du's claim was that measured data had higher values than the model predicted. PCOSI submitted that because it did not explicitly account for traffic emissions in its modelling, it did not expect good agreement between modelled predictions and measured data.

PCOSI stated that it predicted infrequent exceedances of the Alberta Ambient Air Quality Objectives (AAAQO) in all modelling scenarios, but it expected these to occur in close proximity to industrial facilities. It predicted no exceedances of the AAAQO at any of the residential receptors due to the normal operation of the upgrader. PCOSI stated that maximum predicted 1-hour SO₂ concentration at the Shaws' residence was one-third of the AAAQO. PCOSI said that it predicted exceedances of 1-hour SO₂ AAAQO due to emissions from the proposed upgrader; however, these exceedances were localized near the PCOSI fence line and were predicted to occur 1 hour every 44 years, assuming that higher-than-normal short-term SO₂ emissions were to happen 100 hours per year.

PCOSI stated that its modelling assessment did not take building downwash into consideration but believed that it would be prudent prior to commencing construction that the facility design be checked to ensure that building downwash did not adversely affect pollutant dispersion. Accordingly, PCOSI committed to rerun the CALPUFF model, taking building downwash into account using the Building Profile Input Program (BPIP), and would, at the request of stakeholders, share the results with them.

7.1.2 Views of NESCIL/CFRD

NESCIL/CFRD expressed concern about the many pollutants that would be emitted from the proposed upgrader and the effect these pollutants would have on humans and the environment. NESCIL/CFRD recommended that a decision on the project be deferred until a cumulative environmental management plan was in place to reduce air pollution to levels that were more protective of human health and to stop the increasing areal extent of acidifying emissions.

NESCIL/CFRD did not believe that the proposed upgrader employed BATEA. NESCIL/CFRD stated that it was important to get upgrader emissions as low as possible and to make sure that new upgraders employed BATEA. NESCIL/CFRD asserted that to protect air quality, new projects should be delayed until existing operations had considerably reduced their emissions.

NESCIL/CFRD stated that PCOSI should implement a plan to reduce ozone formation so that occurrences of negative health effects were minimized and that a copy of the plan be provided to NESCIL/CFRD. NESCIL/CFRD's expert Dr. Blake commented that PCOSI's decision to use SCR on the SMR furnace to reduce NO_x emissions was positive. However, NESCIL/CFRD believed that it would not be in the public interest to approve the release of additional NO_x emissions into the airshed, since the region was already required to develop an air quality management plan to ensure that ozone levels did not exceed the Canada Wide Standard in the future.

NESCIL/CFRD argued that there was uncertainty about components of the project that PCOSI was proposing. NESCIL/CFRD believed that there was conflicting information in evidence as to which technology, SMR or liquids gasification, would result in higher emissions. In the end, NESCIL/CFRD asserted that whatever technology was chosen for the upgrader, it would be adding emissions to the airshed and the air quality would worsen.

Dr. Du, NESCIL/CFRD's air modelling expert, concluded that in its application PCOSI had adequately presented details relating to air issues, including air emissions, meteorological conditions, dispersion model selection, model options, and modelling results. Dr. Du noted that appropriate models were used in the air dispersion modelling and most of the model options were properly selected.

NESCIL/CFRD submitted that it was concerned about fugitive emissions coming from the PCOSI upgrader. This was emphasized by evidence from its expert Dr. Du, who stated that PCOSI had underestimated emissions for some pollutants by a factor of 13.45. He said that as a result, PCOSI had underestimated the modelled air concentrations by the same amount. Dr. Du determined this factor from a comparison of modelled and measured benzene concentrations. Dr. Du argued that he expected modelled and measured concentrations to be in perfect agreement. To achieve this, he suggested that modelled emissions would need to be increased by a factor of 13.45. NESCIL/CFRD was not convinced by PCOSI's argument that poor model performance could be explained by the exclusion of transportation emissions. It believed that the exclusion of transportation emissions would also affect the model performance for NO_x and carbon monoxide (CO) and the evidence showed good agreement for those pollutants.

Due to the concern about fugitive emissions, NESCIL/CFRD believed that PCOSI should conduct periodic DIAL surveys to quantify hydrocarbon fugitive emissions as part of its LDAR program. NESCIL/CFRD submitted reports showing that fugitive emissions could be underestimated at refineries and that DIAL measurements gave a better estimation of fugitive emissions.

NESCIL/CFRD argued that PCOSI did its air modelling work haphazardly. NESCIL/CFRD stated that the fact that PCOSI's project description continued to change after completion of the initial air modelling work in July 2006 did not inspire public confidence. NESCIL/CFRD believed that predicted exceedances of the AAAQO in all modelling scenarios was an indication that the air quality in the area was poor and that it would only worsen in the future. NESCIL/CFRD stated that it had no confidence in the validity of PCOSI's air modelling predictions, whose performance was measured against faulty data from the eight Fort Air Partnership (FAP) air monitors.

NESCIL/CFRD argued that once the engineering design and plot plans were finalized, PCOSI should redo its dispersion modelling by incorporating BPIP to make sure that no buildings or structures would cause any building downwash that could adversely affect the dispersion of pollutants emitted from stacks and report the results to NESCIL/CFRD.

7.1.3 Views of the Shaws

The Shaws expressed concern about fugitive emissions from the proposed facility. The Shaws argued that PCOSI should install vapour recovery systems on all of its floating roof tanks (not just sour tanks) and on any place where fugitive emissions could be collected with some

efficiency. The Shaws believed that there were many uncertainties with regard to how project emissions would affect their health and the well-being of their cattle. The Shaws stated that they would like PCOSI to ensure that it developed a system for reporting flaring incidents and that it explained the system to nearby residents.

7.1.4 Views of Dr. Hoehn

Dr. Hoehn stated that PCOSI should try to achieve better emission reductions instead of just meeting the minimum standards imposed by government.

7.1.5 Views of the Board

The Board notes that PCOSI completed an air quality assessment in support of its application. The Board notes NESICL/CFRD's claim that it identified a number of potential deficiencies in the assessment and in the design of the facility with regard to emission estimates, management, and dispersion modelling. However, other than PCOSI's exclusion of building downwash considerations in its dispersion modelling, the Board finds that the air quality assessment was completed satisfactorily and that the emissions estimates were done using good engineering judgement. The Board also notes that PCOSI's air quality assessment was done in accordance with AENV's TOR requirements and that AENV has deemed the EIA to be complete.

The Board notes that PCOSI will design its sulphur recovery facilities to achieve a 99.9 per cent sulphur recovery and that it has requested that it be approved to achieve a 99.5 per cent sulphur recovery on a calendar quarter-year basis. Given the total volume of SO₂ emissions in the AIH, it is the policy of the ERCB to require all new upgraders to achieve a minimum calendar quarter-year sulphur recovery of 99.5 per cent. The Board also notes PCOSI's request to achieve its sulphur recovery efficiency within 12 months of start-up. However, it has been the practice of the Board in approving upgrader projects like PCOSI's that the required sulphur recovery efficiency is to be achieved within 6 months of commencing start-up activities. The Board sees no reasons in this case to vary from its usual practice. Therefore, the Board will condition PCOSI's approval to require it to achieve a 99.5 per cent calendar quarter-year sulphur recovery within 6 months of commencing start-up activities.

The Board understands that PCOSI will use SMR to produce hydrogen in Phase 1 and liquid gasification technology in Phase 2. The Board notes that in Phase 2, PCOSI will use SMR as a backup only, although PCOSI may ultimately choose to use SMR as the primary method for hydrogen production in all phases. The Board is satisfied that from an air modelling standpoint, the liquids gasification scenario in Phase 2 will result in higher site-wide emissions than using SMR and that PCOSI has, therefore, evaluated the worst-case scenario from an emissions standpoint. The Board notes that any changes in the project's emission profile as a result of technology changes will need to be reviewed by the ERCB and AENV.

The Board acknowledges PCOSI's view that it has incorporated BATEA in all aspects of its upgrader design. However, the Board notes that there is no standard definition of what emission reduction strategies conform to BATEA and that economic achievability is subjective. The Board notes that PCOSI's sulphur recovery efficiency will meet the ERCB's sulphur recovery guidelines consistent with those required in EUB *Decision 2007-058* for the North West upgrader. The Board also acknowledges that PCOSI has chosen to install SCR on its largest NO_x

source, which would reduce site-wide NO_x emissions by 30 per cent in Phase 1 relative to not implementing SCR. The Board believes that PCOSI could reduce its NO_x emissions further using SCR on other sources, specifically in Phase 2 when the SMR furnace will be used as a backup only and the NO_x emission reductions will not be fully realized as proposed in the application. The Board understands that the facility will be designed to incorporate further emissions reductions should those be required in the future. The Board notes that further emissions reductions may be required in the future through the AIH emission caps and the Ozone Management Plan for the Edmonton CMA.

The Board notes that the interveners expressed a great deal of concern about fugitive emissions from the facility. The Board believes that PCOSI completed an emissions inventory using acceptable methods that included an estimate of fugitive emissions. The Board notes Dr. Du's assertion that emissions of some pollutants from the upgrader have been underestimated by a factor of 13.45. The Board does not agree with this assertion and finds that it was adequately refuted by PCOSI. The Board is seriously concerned that Dr. Du's assertions may have inappropriately and needlessly alarmed the residents. In addition, the Board is concerned that members of the public may have heard or read the assertion but were not privy to the cross-examination that refuted it. The Board expects experts at ERCB hearings to have a better understanding of the material before making definitive and potentially alarmist statements.

The Board accepts PCOSI's reasoning that a perfect match between modelled and measured benzene concentrations is not reasonable, considering the exclusion of benzene emissions from transportation sources in the modelling. The Board notes that NO_x and CO emissions from transportation were included in the modelling so that a better agreement between measured and modelled concentrations would be expected for these pollutants. Hence, the Board finds that the emissions of benzene, 1,3 butadiene, and formaldehyde were not underestimated but were estimated using best engineering judgement. The Board notes that it is still imperative that fugitive emissions be properly managed through regular detection and maintenance.

The Board notes that the changes in the design of the facility could impact the fugitive emissions estimate. Accordingly, the Board will condition PCOSI's approval to require it to provide a revised estimate of fugitive emissions, including tank emissions, after the design of the facility has been finalized and prior to start-up to ensure that the original fugitive emissions estimate was reasonable. The Board will also require PCOSI to advise the ERCB on the impacts on air quality and human health from fugitive emissions based on the final detailed design of the upgrader and whether the changes from the original assessment are material.

The Board notes that PCOSI has designed the upgrader to minimize fugitive emissions and committed to implementing an LDAR program to manage fugitive emissions during operation. The Board understands that an LDAR program will be required as part of any *EPEA* approval and ultimately it will be AENV that will determine the requirements of the LDAR program for the proposed upgrader.

The Board notes the evidence presented at the hearing regarding DIAL measurements that showed the potential for fugitive emissions to be underestimated at sour gas plants or refineries. The Board understands that the DIAL technology is a useful tool for quantifying fugitive emissions but notes that this tool has some limitations. Therefore, the Board will not condition its approval to require periodic DIAL surveys but expects that PCOSI will consider this technology

when developing its LDAR program. The Board acknowledges the evidence that suggests that a gas leak imaging camera is a method recommended to aid in leak detection and that PCOSI expressed an interest in using this technology at the proposed upgrader. The Board recommends to AENV that it consider conditioning its approval to require PCOSI to use this technology as part of its LDAR program. (See Appendix 7 for the Board's recommendations.)

The Board notes that PCOSI has committed to design all tanks to meet the CCME Code of Practice for the Control of Fugitive Emissions from Above Ground Storage Tanks. The Board further notes that PCOSI has committed to install vapour recovery on tanks holding sour products. Regarding the Shaws' request that vapour recovery be implemented on all tanks the Board finds that there was no evidence on record to suggest that the Shaws could be adversely affected by emissions from the non-sour tanks. The Board notes that the human health risk assessment (HHRA) did not predict adverse impacts at the Shaws' residence. Hence, the Board will not condition PCOSI's approval to have vapour recovery on all storage tanks. The Board expects that meeting the CCME guidelines will likely be a condition of the *EPEA* approval. The Board further expects PCOSI to consider the Shaws' request as it moves to final design stage.

The Board understands that the main component of fugitive emissions is VOCs, which are precursors to ground-level ozone formation. The Board recognizes that the AIH is part of the Edmonton CMA, which is required to implement a plan to manage ground-level ozone levels. Therefore, the Board expects PCOSI to meet the requirement of this ozone management plan, which will ultimately be enforced by AENV.

The Board finds that the dispersion modelling assessment completed by PCOSI was satisfactory. The Board notes that the interveners did not express any concern about the modelling approach used by PCOSI other than the exclusion of building downwash. The Board acknowledges PCOSI's commitment to rerun its dispersion modelling using CALPUFF and to incorporate building downwash at the request of the interveners. The Board believes that this is a useful endeavour that will ensure that the conclusions of the air quality assessment will not change once the design of the facility is finalized. Therefore, the Board will condition PCOSI's approval to require it to rerun its dispersion modelling using CALPUFF and incorporate building downwash and to supply its updated modelling to the Board, AENV, and the interveners before construction commences.

The Board acknowledges that there are predicted exceedances of the 1-hour SO₂ AAAQO due to emissions from the PCOSI upgrader. The Board notes that these exceedances occur very infrequently, on the order of 2 hours per year at the worst-case off-site receptor. The Board notes that the maximum 1-hour SO₂ prediction is 461 micrograms per cubic metre (µg/m³) which is only slightly greater than the AAAQO of 450 µg/m³. These predictions also coincide with the situation of higher than normal SO₂ emissions occurring continuously over one year. The Board believes it is necessary to include risk when considering the acceptability of the predicted exceedances. As such, considering the conservatism in the modelling, the infrequency and location of predicted exceedances, and the magnitude of the predictions, the Board finds that it is unlikely that the predicted SO₂ exceedances will occur and therefore SO₂ emissions from the proposed upgrader pose a very low risk to the health and safety of the public.

The Board notes that exceedances of the Canada-wide standard for particulate matter of less than 2.5 microns in diameter (PM_{2.5}) and the AAAQO for H₂S and SO₂ were predicted in all

modelling scenarios. The Board finds that the predicted exceedances of PM_{2.5} were mainly due to existing emissions from non-industrial sources in Edmonton and Fort Saskatchewan. Exceedances of H₂S and SO₂ were found to be localized around existing, approved, and proposed industrial facilities. The Board notes that the contribution of the proposed upgrader to these exceedances is negligible.

7.2 Air Monitoring and the Fort Air Partnership

7.2.1 Views of PCOSI

PCOSI stated that regional air monitoring initiatives were best directed by and managed through FAP. PCOSI was a funding participant of FAP through its membership in the Northeast Capital Industry Association (NCIA),⁸ and its funding contribution would increase should the proposed upgrader proceed. PCOSI stated that it would participate in and support FAP and would participate through FAP in a regional air quality management plan.

PCOSI stated that if its project were approved, it was very likely that it would be a requirement of its *EPEA* approval that it install one or more continuous ambient air monitoring stations. PCOSI believed that the location for additional monitoring stations would be determined in consultation with AENV, but PCOSI committed to forward the NESCIL/CFRD recommendations for station locations to FAP for consideration.

PCOSI argued that NESCIL/CFRD was incorrect in stating that FAP was a completely volunteer organization, as there were contractors who maintained the monitoring network and collected the data and FAP was supported by multistakeholder representation. PCOSI added that widespread use of the Internet had improved how monitoring data were collected and distributed and the quality of data had increased. PCOSI believed that the 8 continuous stations and 40 passive stations currently in the FAP network were appropriate to characterize existing air quality in the area, but acknowledged that more monitoring would likely be required in the future if further industrial development proceeded.

PCOSI argued that the mandate of FAP to provide information to the public was met by making data available on its Web site. PCOSI was of the opinion that the direct communication sought by members of NESCIL/CFRD was never envisioned by FAP and that the organization was not currently organized to provide such communication. In PCOSI's view, the interveners' expectation that FAP could provide an "early warning system" for community residents was misplaced. It maintained that data provided by FAP could only give a backward-looking view of air quality in the area. Data must go through verification and quality control checks before being finalized and therefore were only of value in determining compliance and air quality trends in the area.

With respect to the recent AENV audit results of FAP, PCOSI noted that far from being a cause for alarm, the audit and corrective actions taken showed that AENV was fulfilling its overseeing role correctly. PCOSI stated that it would support the ERCB in a review of FAP should the Board request it.

⁸ The NCIA is a not-for-profit cooperative representing industry located in the AIH. The NCIA works with other associations, government organizations, and community groups at the local, regional, and provincial levels to address environmental, health, safety, infrastructure, and community issues.

PCOSI stated that it would participate with FAP in all future monitoring initiatives, whether it was the expansion of the existing monitoring network or an expansion into a new area of concern, such as the potential acid input and terrestrial effects monitoring, which it recommended be initiated in the future. PCOSI would support FAP on any AENV-initiated programs on VOC monitoring.

In the event that NESICL/CFRD expert's recommendations are not adopted by FAP, PCOSI committed to consider installing passive monitors at locations deemed important in Dr. Du's analysis. PCOSI would integrate monitoring data from these additional stations with the FAP network data and would increase its funding to FAP to cover the costs associated with this commitment.

PCOSI argued that although there had been measured exceedances of the 1-hour SO₂ AAAQO, these exceedances were very infrequent, localized around existing industry at the Redwater and Scotford stations, and were not indicative of poor air quality in the area. PCOSI asserted that there had been no measured exceedances of the annual SO₂ AAAQO.

PCOSI noted that NESICL/CFRD's expert witness Dr. Blake had analyzed a number of air samples from the AIH and compared the results to those from Mexico City. PCOSI argued that the results of the analysis of these samples did not show a cause for concern and that the quality of the air in the AIH was not close to that of Mexico City. PCOSI asserted that Dr. Blake's concern about elevated styrene levels was readily explainable by the proximity of the measurement to Shell's chemical plant, which manufactured styrene, and noted that the levels that were measured were below the AAAQO.

PCOSI committed to conduct an ambient VOC and polycyclic aromatic hydrocarbon (PAH) study before the project began to use as a baseline comparison with a post-operational study. This would be in conjunction with regional initiatives and shared with stakeholders.

7.2.2 Views of NESICL/CFRD

NESICL/CFRD stated that it had no confidence in FAP. NESICL/CFRD maintained that FAP was a completely volunteer organization and its operations were dependent on the goodwill of the volunteers and whatever time they had available. However, it admitted that contractors paid by FAP maintained the monitoring network and collected the data. NESICL/CFRD stated that FAP was not doing a credible job and that AENV or an independent scientific organization should plan, implement, and manage a comprehensive air monitoring network for the region with mandatory real-time reporting. NESICL/CFRD stated that it had no confidence in an organization that had not posted any minutes of its board meetings for over two years. NESICL/CFRD was concerned about AENV being understaffed and underresourced, failing to follow its own audit protocol documents, and its lack of attention to FAP.

NESICL/CFRD submitted evidence that showed the results of a recent audit by AENV and follow-up communication with FAP. NESICL/CFRD argued that this evidence showed that the monitoring data could be suspect and that audit deficiencies were not addressed in a timely manner.

NESCIL/CFRD also found it disturbing that the FAP monitoring stations appeared to go off line for extended periods of time when industry in the area was experiencing upset conditions. NESCIL/CFRD noted that residents in the area were using the FAP ambient air monitoring system as an early warning system.

NESCIL/CFRD argued that PCOSI's operations should not commence until an effective and comprehensive ambient air monitoring network was established in the region. NESCIL/CFRD believed that PCOSI should retain Dr. Blake or another expert to check the calibration of PCOSI's air monitors on an annual basis. It also believed that one-hour and 24-hour samples should be taken at the FAP stations where total hydrocarbons or non-methane hydrocarbons were quantified and at the same time samples should be taken in a grid pattern in the area. This would allow for validation of the data being recorded at the FAP air monitoring stations and/or illustrate any deficiencies.

NESCIL/CFRD expressed concern that there were an insufficient number of continuous monitors in the area and that the existing monitors did not measure an adequate suite of pollutants to properly characterize the quality of the air in the region. NESCIL/CFRD argued that areas along the Texas Gulf Coast had many more monitors than FAP and measured more pollutants and that there was better enforcement. NESCIL/CFRD asserted that PCOSI should be required to set up multiple continuous monitoring stations along its fence line and other locations as may be required to effectively monitor the emissions from the proposed upgrader and that the monitoring data be made available to the public via a Web site. NESCIL/CFRD argued that these additional monitors were needed to verify PCOSI's claims of pollutants not having any off-site impacts. As well, a grid of continuous monitors for harmful and potentially harmful pollutants covering the whole industrial area was needed for the same reasons.

NESCIL/CFRD believed that air pollution at the maximum level allowed by the AAAQO represented poor air quality. It noted that exceedances of the AAAQO had already occurred in the area. NESCIL/CFRD asserted that the AAAQO were not representative of good air quality nor were they protective of human health because the AAAQO were based on an evaluation of not only scientific factors but also considered social, technical, and economic factors. It was NESCIL/CFRD's position that this was a rural area in which its members had an expectation and a right to unimpaired air quality.

NESCIL/CFRD argued that there appeared to be no consequences whatsoever for exceedances of the AAAQO, which eroded public confidence in the regional monitoring network and in the regulators who oversaw the regional monitoring network and the protection of air quality and human health.

NESCIL/CFRD submitted that the Board should be wary of approving yet another upgrader in a locale that had already experienced measured exceedances of the AAAQO, even if those measured exceedances were few. It maintained that the public interest should dictate that PCOSI's upgrader be located elsewhere in Alberta.

7.2.3 Views of the Shaws

The Shaws noted that there was no air monitoring system currently proposed that would allow the Shaws, the Groots, and others located very close to the proposed project to determine on their

own whether an emergency evacuation was needed. The Shaws argued that they needed to have ambient air monitoring to understand short-term and long-term exposures to various chemicals and the implications of exposure to those chemicals.

The Shaws argued that PCOSI should install a continuous air and noise monitor on their property that would measure SO₂, nitrogen dioxide (NO₂), ozone (O₃), H₂S, PM, benzene or n-hexane and other surrogates, such as odour, noise, wind speed and direction, and temperature. These data would be available to the Shaws and PCOSI and would allow the Shaws to make decisions on their health and safety. Further external warning systems should be installed, such as acute alarms. The Shaws asserted that PCOSI should train them in odour detection, basic operation of the monitoring equipment, and reading and analysis of the air monitors.

7.2.4 Views of Mr. Smulski

Mr. Smulski believed that FAP was shown to be lacking in many areas that were important to rectify, as new plants had relied on FAP. Mr. Smulski stated that FAP should welcome a third-party review, which should include a communication component so that lay people in the area had some level of comfort with the reported data.

7.2.5 Views of the Board

The Board heard many conflicting views about FAP and ambient air quality monitoring in the AIH. NESICL/CFRD said that FAP is not doing a credible job in monitoring the air in the region and that there needs to be a great deal of work and resources allocated to get an appropriate and reliable air monitoring network for the region. PCOSI maintained that FAP was doing a good job, the current monitoring network was adequate and credible, and FAP was fulfilling its mandate.

The Board notes the FAP mission statement from the 2004 annual report:

To generate and provide accurate, reliable and credible air quality information and a transparent and open forum to discuss this information and air quality issues. This will allow the public, industries and government to better manage and improve regional air quality, to influence policy and to protect our environment and public health.

The Board understands that FAP has been given the responsibility by AENV of collecting and disseminating ambient air quality in the region. Ultimately, the Board considers that it is AENV's responsibility to ensure that FAP is fulfilling its mandate. The Board notes that the interveners were confused about the FAP organization structure and what role volunteers play in the organization. The Board notes that FAP is not an entirely volunteer organization because there is a third-party contractor who manages the air monitoring network and AENV is responsible for auditing the network.

The Board also notes that the interveners said that communication with FAP was difficult at times and they did not receive timely responses to their information requests. The Board believes that FAP should operate with transparency and information requests by the public should be answered in a timely manner.

The Board notes that AENV is responsible for overseeing the activities of FAP and for ensuring that air monitoring is conducted in accordance with the *Air Monitoring Directive (AMD)*.⁹ The Board notes that AENV conducted an audit of the FAP ambient air monitoring stations in May 2007 and that the audit identified a number of deficiencies in the air monitoring network and highlighted the need for additional work to ensure compliance with the *AMD*. The Board acknowledges the concerns that residents have expressed with respect to the audit findings and the follow-up by FAP and AENV to those findings. It is the Board's view that the timely repair of the problems identified in the audit is necessary to ensure the quality and credibility of the ambient air quality data. Therefore, the Board recommends that AENV confirm that the deficiencies raised in the May 2007 audit have been addressed and that AENV communicate with the community in a timely manner that the work has been completed. The Board further recommends that AENV conduct regular audits to ensure that the monitoring network is operating correctly and providing credible data. The Board expects that as part of its oversight of FAP, AENV will determine if it is warranted to have Dr. Blake or another independent expert calibrate the FAP monitors.

The Board notes that the role of FAP is not clear to some of the public. The Board understands that the ambient air monitoring network is not an early warning system but that is how some of the public wish to use it. It is the Board's view that AENV must ensure that FAP clearly communicates its role and how ambient data should be used by the public. The Board is satisfied that the FAP data are readily available through the Internet but acknowledges the potential for this information to be misunderstood or misinterpreted.

It is the Board's understanding that the monitoring done by FAP is performed for compliance and regional purposes. The Board further understands that there is a process for determining what emissions to monitor and how to monitor those emissions and monitor locations. The Board appreciates that this process takes into account many factors and accepts that AENV and FAP have sufficient justification for their conclusions on these matters. The Board recommends to AENV and FAP that they jointly publish a document that explains the scope, purpose, and intent of the monitoring programming in a manner that is easily understandable by the general public. In addition, the Board recommends to AENV that it consider making the data available by means other than the Internet.

The Board is of the view that the air monitoring network should be dynamic and capable of responding to new and unexpected issues and challenges. The Board expects that FAP and AENV will take the concerns of the public into account with regard to the location of monitors and the suite of chemicals measured and incorporate their suggestions if there are reasons to do so. The Board understands that the specific ambient air monitoring requirements for this project will ultimately be determined by AENV, likely be set out in the *EPEA* approval, and be implemented through FAP.

The Board notes that there have been measured exceedances of the AAAQO at some of the FAP monitoring stations. The Board believes that measured exceedances are a cause for concern if

⁹ The *AMD* (1989) and its amendments (*AMD*, 2006) represent the environmental monitoring and reporting requirements in Alberta. The directive sets out the framework for planning, implementing, documenting, and assessing the environmental monitoring and data operations and for carrying out required quality assurance and quality control. The directive covers minimum performance specifications, specific quality assurance requirements for ambient air monitoring equipment, and acceptable ambient air monitoring methods.

they are frequent, if they exceed the objective in a substantial way, or if they are ignored and not investigated by the proper authorities. However, the Board was not presented with evidence that any of the above situations have been or are likely to be experienced. To the contrary, the evidence shows that recorded exceedances are very infrequent, exceed the objective by only a small margin, and are appropriately analyzed by the authorities. Notwithstanding, the Board recommends to AENV that it consider advising the public about the procedures that are in place to identify and follow up if an exceedance is measured at one of the FAP monitoring stations.

The Board believes that FAP could better fulfill its mandate by providing improved communication to the public. The Board intends to contact AENV about the concerns that have been raised about FAP and, in addition, expects PCOSI to assist in ensuring that the issues identified by the interveners are brought to AENV's attention and addressed. However, for the reasons expressed above, the Board does not believe that an overhaul or third-party review of FAP is necessary.

The Board finds that the ambient air monitoring done by Dr. Blake provided little assistance in determining the potential impacts of the project on air quality. Further, the Board finds that there was no credible evidence before it to support Dr. Blake's suggestion that the air quality in the AIH is comparable to Mexico City. To the contrary, the limited air monitoring results presented by Dr. Blake showed emission levels below the AAAQO, and where there were elevated levels of some of the pollutants, these were readily explainable by proximity to industry, such as Shell's chemical plant.

The Board notes that Dr. Blake's monitoring were one-minute samples and cannot be used to characterize the overall air quality in the area. As well, the Board saw no evidence to suggest that the sampling followed appropriate protocols. While Dr. Blake stated that he regretted anything alarmist about his work, the Board notes that the public could easily make the inference that the air quality in the AIH was comparable to Mexico City, especially if his follow-up clarifying remarks were not available to them.

The Board notes PCOSI's commitment to conduct VOC and PAH monitoring before operations commence. The Board supports this commitment and expects PCOSI to ensure that the results of the study are available through FAP.

The Board notes the interveners' assertion that the AAAQO are not protective of human health. The Board notes that the AAAQO are set based on scientific, social, technical, and economic factors. The purpose of air quality objectives or standards is to be part of overall air quality management to ensure that emission control policies are successfully protecting human and ecological health. The Board considers that the definition of air quality involves many factors, including the degree to which the AAAQO are exceeded and the frequency of exceedances at the same monitoring locations.

The Board is aware of further industrial development planned for this area. The Board heard evidence regarding the effects of SO₂ and NO_x emissions on ecosystems. Notwithstanding the regional emission caps proposed for the area, the Board strongly recommends to AENV that a terrestrial monitoring program be implemented for the area to ensure that ecosystem health can be better quantified and that problems can be identified early.

The Board recognizes that the Shaws' and the Groots' parcels are adjacent to the PCOSI lands. The Board will not condition the project to place continuous ambient monitors at the Shaws' and the Groots' residences or fence lines. The Board notes that monitoring requirements are the responsibility of AENV. The Board is of the view that proper operation of the facility and good emergency response planning will protect the health and safety of the public and that ambient air monitors should not be used as an early warning system.

7.3 Other Air Issues

7.3.1 Views of PCOSI

PCOSI believed that an integrated industry and government approach on carbon sequestration was necessary and stated that it would continue to participate in the efforts currently under way. Notwithstanding that, PCOSI committed to look for commercial arrangements for the use of its carbon dioxide (CO₂) as part of an enhanced oil recovery scheme and to design its upgrader to be carbon capture ready regardless of whether liquids gasification or SMR were used in Phase 2.

PCOSI asserted that the upgrader would be designed and operated to promote energy efficiency and to reduce greenhouse gases (GHGs). PCOSI stated that transport pipelines and hot process vessels would be insulated to conserve energy and that energy efficiency and proactive ways to manage GHGs would be promoted, combustion air would be preheated wherever practical to increase combustion efficiency, and thermally efficient heaters, furnaces, and boilers would be used.

PCOSI believed that dust emissions from construction and operation of the proposed upgrader would be managed effectively. PCOSI committed to employing dust control measures at open points where appropriate, such as at conveyor transfer points, paving permanent access roads, covering trucks transporting bulk materials to the site, and spraying the emergency coke storage area with water. PCOSI stated that its industrial hygiene monitoring program would confirm the efficacy of dust suppression during catalyst changeout and that PCOSI would use professional technology companies with experience in dust suppression and control in these kinds of applications.

7.3.2 Views of NESCIL/CFRD

NESCIL/CFRD argued that if the project were approved, it should be deferred until a system was in place to take CO₂ to suitable locations for geologic sequestration. NESCIL/CFRD believed that PCOSI should install carbon capture technology in Phase 1 and Phase 2 and the extra CO₂ arising from the carbon capture facilities should be directed to carbon sequestration or enhanced oil recovery from nearby oil fields. NESCIL/CFRD noted that this would add capital and complexity to the project, but argued that the project should be capable of carbon capture at the outset, as subsequent revamping to accommodate carbon capture technology could be difficult and expensive if not fully contemplated and planned for during the original design.

NESCIL/CFRD expressed concern that the ERCB and AENV had not been giving the AIH the priority or attention that it needed, and it was particularly concerned that AENV did not have the resources to properly assess, monitor, and police industry. NESCIL/CFRD asked that the ERCB open an office in the AIH and staff it with inspectors. It emphasized that this was one of the most

industrialized areas in western Canada in terms of oil, gas, and petrochemical-related industries. NESICL/CFRD believed that greater resources must be devoted to regulating this heavily industrialized area and that AENV was not up to the task.

7.3.3 Views of the Board

The Board is satisfied that PCOSI will design the facility to be carbon capture ready and will implement measures to reduce GHGs and maximize energy efficiency. The Board notes that AENV is the responsible regulatory authority for GHG emissions management through the *Climate Change and Emissions Management Act*.

The Board believes that the measures to reduce dust during construction and operation are adequate and expects PCOSI to follow these measures.

The Board believes that with respect to air issues in general, there is a need for The Board to review its activities respecting those facilities for which it has jurisdiction in the AIH and to better coordinate its activities with those of AENV to provide for a more effective and comprehensive regulatory system. Accordingly, the Board will conduct such a review and will be in contact with AENV for that purpose.

8 HEALTH

8.1 Human Health Risk Assessment Methodology

8.1.1 Views of PCOSI

PCOSI indicated that the methodology used in its human health risk assessment (HHRA) was consistent with accepted standards, and that the results were reviewed by Alberta Health and Wellness (AHW) and by Health Canada. PCOSI also indicated that the HHRA was conservative, employing a number of safety factors or uncertainty factors.

In response to concerns of NESICL/CFRD that many of the exposure limits adopted by PCOSI for the HHRA were higher than those used in other jurisdictions, notably Texas, PCOSI indicated that exposure limits selected for use in the HHRA were required to meet a number of criteria, including being protective of health and being supported by adequate scientific documentation. PCOSI noted that many Texas effects screening levels (ESLs) were “interim,” were based on effects other than health, and lacked adequate documentation.

PCOSI did not anticipate that groundwater and surface water would be impacted by the project and, therefore, did not consider exposure pathways originating in groundwater and surface water (including fish consumption) in the HHRA. With respect to NESICL/CFRD’s concerns regarding the accumulation of methyl mercury in fish, PCOSI noted that local lakes were highly buffered, reducing the likelihood of methyl mercury formation.

In response to the views of the Shaws that other determinants of health, such as well-being and stress, should be considered in the HHRA, PCOSI noted that stress was raised as a concern during the public consultation process. It proposed to address the issue using appropriate

mitigation measures. PCOSI agreed with the Shaws that such mitigation measures needed to be effective and allow the Shaws to feel safe.

8.1.2 Views of NESICL/CFRD

In general, NESICL/CFRD stated that potential health risks associated with the release of chemicals were of significant concern to the residents of the area, some of whom suffer from asthma and other illnesses. NESICL/CFRD questioned the credibility and reliability of the HHRA.

NESICL/CFRD considered the exposure limits used in the HHRA to be too high or higher than those used by other regulatory agencies, particularly Texas. PCOSI used values that were less protective than the Texas ESLs for 70 per cent of the chemicals evaluated. In light of this, NESICL/CFRD questioned PCOSI's view that the results of the HHRA were conservative.

NESICL/CFRD indicated a concern that groundwater pathways had not been considered in the HHRA, noting that groundwater pathways should not be excluded lightly. NESICL/CFRD also expressed concern that surface water quality could be affected by atmospheric deposition, leading to increased acidity and the possible accumulation of methyl mercury in fish.

NESICL/CFRD expressed concern about heavy reliance on data from FAP, given its view that the reliability and credibility of the FAP program were low.

8.1.3 Views of the Shaws

The Shaws considered risk assessment to be an imprecise science involving a large number of uncertainties that required the use of safety factors and conservative assumptions. As a result, they believed that a conclusion of no unacceptable risk overstated the certainty of the results of the HHRA. The Shaws also believed that the HHRA should address other determinants of health, such as stress and well-being.

8.1.4 Views of the Board

The Board acknowledges that the potential health risks associated with existing and future industrial activities are of concern to residents in the area. The primary objective of an HHRA is to provide a conservative estimate of the risk and significance of potential adverse effects on an individual, community, or population that could arise from changes in environmental quality due to a project. The goal is to ensure that any potential risks associated with a project are negligible or insignificant. Guidance is available from a number of agencies, including Health Canada and AHW, on the conduct of the HHRA to ensure consistency, transparency, and conservatism.

The Board is satisfied that the HHRA was conducted in accordance with accepted standards and was reviewed by both AHW and Health Canada. The Board notes that those agencies provide guidance with respect to the selection of appropriate exposure limits or toxicity reference values (TRVs), giving preference to human health-based values published by Health Canada, U.S. Environmental Protection Agency, California Environmental Protection Agency, World Health Organization, Netherlands National Institute for Public Health and the Environment, U.S. Agency for Toxic Substances and Disease Registry, and other relevant provincial guidelines, such as the Alberta and Ontario ambient air quality objectives. The HHRA adhered to this

guidance and applied a number of criteria to ensure that the selected exposure limits or TRVs were both protective and defensible. With respect to the Texas ESLs introduced by NESICL/CFRD, the Board accepts that these would generally not meet the criteria for inclusion as they are in many cases interim and/or based on effects other than human health. The Board is therefore satisfied that appropriate exposure limits and TRVs were applied.

With respect to NESICL/CFRD's concern that groundwater and surface water exposure pathways were not included in the HHRA, the Board notes that the EIA considered potential impacts on groundwater and surface water and concluded that groundwater and surface water quality would not be adversely affected. The Board therefore accepts the conclusion of PCOSI's HHRA that the exposure pathways originating in groundwater and surface water need not be considered.

The Board also acknowledges the concerns of NESICL/CFRD regarding the reliance on data from FAP in the baseline risk assessment. However, the Board notes that the majority of concerns expressed by NESICL/CFRD regarding FAP pertain to FAP's role, management, and communication with the public. While NESICL/CFRD has also questioned the quality and credibility of the data collected by FAP, the Board is not concerned about this, as it believes that AENV is properly overseeing the monitoring that is occurring. The Board understands that the intent of the FAP data is to provide an overall indication of baseline air quality in the area and, in that respect, accepts that the data collected are suitable for inclusion in the HHRA. Furthermore, as noted in Section 7.2 of this report, PCOSI plans to undertake further baseline air monitoring (e.g., a VOC/PAH study) and to work with FAP on future monitoring initiatives. The Board believes that any supplementary data collected would provide the opportunity to update the HHRA if that were found to be necessary.

The Board agrees with the Shaws that there are uncertainties in the science of risk assessment requiring the use of uncertainty factors or safety factors and conservative assumptions. The Board notes that uncertainty factors or safety factors are incorporated into the exposure limits and TRVs to ensure that they are protective of sensitive receptors. In addition, the Board accepts that conservative assumptions were made at various stages throughout the air modelling and the HHRA to ensure that potential exposures were not underestimated. The Board therefore accepts that any uncertainties are addressed by virtue of the conservatism and that the HHRA will err on the side of safety.

With respect to the views of the Shaws that the HHRA should address other determinants of health, such as stress and well-being, the Board notes that the HHRA fulfilled the TOR prepared by AENV for the EIA, which do not require explicit consideration of these aspects; the HHRA also met the requirements of AHW and Health Canada. However, the Board agrees that stress and well-being are important issues and notes that PCOSI intends to address these issues through direct consultation and mitigation, with the goal of ensuring that local residents feel safe.

8.2 Predicted Health Effects

8.2.1 Views of PCOSI

Based on the HHRA, PCOSI concluded that no adverse health effects were expected as a result of the project. PCOSI predicted that guidelines for respiratory irritants would be exceeded at a

few locations, though not at any residences. These predicted exceedances were indicated as being infrequent and limited to locations immediately adjacent to industrial facilities.

The HHRA determined that for some chemicals baseline exposures may exceed applicable exposure limits (i.e., the concentration ratio may exceed 1.0). In response to NESICL/CFRD's concerns that additional emissions should not occur when the concentration ratio already exceeds 1.0, PCOSI indicated that the baseline respiratory risks were overstated estimates of the true baseline risks.

In support of the assertion that baseline risks were overstated and also in response to concerns from NESICL/CFRD regarding the incidence of cancer and respiratory illness in the area, PCOSI cited studies by AHW and Capital Health that concluded that overall health in the area was comparable to that in other areas of the province.

PCOSI assessed potential health risks associated with vehicle emissions during construction. Emissions over a 2-year construction period were predicted to be small in relation to emissions during the operational phase. In response to NESICL/CFRD's view that cancer risks associated with diesel particulate emissions during construction would be significant, PCOSI presented evidence that such risks would not be unacceptable, even over an 8-year construction period.

8.2.2 Views of NESICL/CFRD

NESICL/CFRD noted that the estimated concentration ratios for some chemicals exceeded 1.0 under baseline conditions. NESICL/CFRD considered a concentration ratio greater than 1.0 to be cause for concern and questioned whether adding more emissions of the respective chemicals was in the public interest.

As discussed in Section 7.1 of this report, NESICL/CFRD's air modelling expert inferred that emissions factors for benzene, 1,3 butadiene, and formaldehyde had been underpredicted by a potential factor of 13.45. Based on this underestimate, he suggested that these chemicals could pose significant cancer risks to residents of the area.

NESICL/CFRD's air modelling expert also concluded that cancer risks caused by exposure to diesel particulate matter during construction could be quite significant. As a result, NESICL/CFRD believed that PCOSI's use of any diesel-fuelled vehicles should be restricted to the first year of construction of Phase 1 and then at the beginning of Phase 2; neither PCOSI nor any third-party contractors should use any diesel-fuelled vehicles in the remaining 4 to 6 construction years. Additionally, PCOSI should be required to use low sulphur diesel fuel when constructing the project.

NESICL/CFRD expressed concern with respect to the high incidence of cancer and respiratory illnesses in the area, based on anecdotal information. The credibility of studies conducted by AHW on the incidence of respiratory illness in the area was questioned by NESICL/CFRD's plant ecology expert, who considered the studies to be of low statistical power and potentially biased.

8.2.3 Views of the Shaws

Given the uncertainties inherent in the HHRA, the Shaws expressed the view that it was unrealistic to conclude that the project would not result in unacceptable health risks.

8.2.4 Views of the Board

The results of an HHRA are commonly expressed in the form of concentration ratios, representing the ratio of the predicted exposure concentration to an established benchmark, i.e., the exposure limit or TRV. A concentration ratio of greater than 1.0 indicates that the predicted exposure may exceed the exposure limit or TRV under the conditions assumed in the risk assessment. However, a concentration ratio of greater than 1.0 does not necessarily signify the presence of an unacceptable risk or the likelihood of an adverse health effect. It normally indicates the need to evaluate the significance of the predicted exposures in the context of the uncertainties and level of conservatism incorporated into the risk assessment. A subsequent determination that potential risks are significant or unacceptable would indicate a requirement for risk management or mitigation.

As noted previously, the Board believes that the HHRA was conducted in accordance with accepted standards and guidelines, that appropriate exposure limits, TRVs, and other assumptions were used, and that the results of the HHRA are reasonably conservative. Based on this, the Board accepts PCOSI's conclusions that the project is not expected to result in any adverse health effects.

The Board notes that even though the project contribution to exposure is low, for certain chemicals the estimated baseline exposure already exceeds the applicable exposure limits (i.e., the estimated concentration ratio exceeds 1.0). While it accepts that these baseline exposures may be overestimated, the Board acknowledges the concerns of area residents regarding the potential effects of multiple projects on air quality and emphasizes the need for adequate air monitoring.

The Board is concerned about statements made by NESCIL/CFRD's air modelling expert that benzene, 1,3 butadiene, and formaldehyde can pose significant cancer risks to residents of the area. The Board understands that the expert reached this conclusion by multiplying modelled air concentrations for these substances by 13.45, the factor by which he considers the emissions to have been underestimated, and extrapolating the results to cancer risk using available California cancer risk factors. The Board finds that the claim that emissions were underpredicted by a factor of 13.45 was refuted by PCOSI in cross-examination, based on PCOSI not having included traffic emissions in its modelling, as discussed in Section 7.1. NESCIL/CFRD's air modelling expert also confirmed that he is not a toxicologist and that no toxicological evaluation was undertaken when applying cancer risk factors to his predicted concentrations to support his conclusion of significant risk. Given these facts, the Board does not accept the statements made by NESCIL/CFRD's air modelling expert regarding cancer risk. Although PCOSI did not include traffic emissions in its modelling, the Board notes that this does not affect the conclusions of PCOSI's HHRA, since background sources such as traffic are not normally included in the estimation of incremental cancer risks due to a project.

NESCIL/CFRD's air modelling expert also concluded that cancer risks associated with diesel particulate emissions during construction could be significant. However, he indicated that his estimate was based on lifetime (70-year) exposure rather than the anticipated period of construction-related diesel emissions (2 years) and that the risks should be multiplied by a factor of 2/70 to reflect exposure during construction. Also, similar to the above, the expert applied a California cancer risk factor for diesel particulate matter without a full toxicological evaluation. Based on the assumptions regarding exposure duration and the lack of a proper toxicological assessment, the Board is unable to accept the conclusions of NESCIL/CFRD's air modelling expert regarding cancer risk during construction. The Board notes that PCOSI's assessment of construction risks, conducted using the same procedures as the assessment of operational risk, indicated that health risks during construction were within acceptable levels, even assuming an 8-year construction period. Therefore, the Board does not believe that a restriction in diesel vehicle usage is warranted.

The Board acknowledges the concerns of NESCIL/CFRD regarding the health of local residents, specifically with respect to cancer and respiratory illness. However, the Board is not aware of any factual evidence that demonstrates a higher incidence of these illnesses within the study area and finds no compelling reason to question the validity of the regional health studies published by AHW. Furthermore, the Board is unable to give weight to the evidence of NESCIL/CFRD's plant ecology expert questioning the credibility of the AHW studies, given that he was not put forward by NESCIL/CFRD as an expert in epidemiology.

In general, the Board is very concerned that many of the assertions of NESCIL/CFRD's consultants will have unnecessarily worried the members of the public without justification. These assertions did not stand up to examination and in some cases went beyond the expertise of the consultants.

9 SURFACE AND GROUNDWATER

9.1 Views of PCOSI

PCOSI clarified its proposed water management strategy by noting that in its original application it had applied to AENV for a water licence to withdraw 14 450 000 m³ of water from the North Saskatchewan River. However, in response to stakeholder concerns regarding water quality and in keeping with AENV's Water Management Framework for the AIH and the Capital Region, PCOSI revised its strategy and proposed to source all of its process water requirements from the Alberta Capital Region (ACR) wastewater facility. PCOSI noted that because of the higher total dissolved solids loading in the ACR water, it would require a higher circulating volume in its cooling circuit and as a result its annual water requirements had increased to 18 250 000 m³.

PCOSI noted that using wastewater was not without risks. Therefore, as a risk mitigation measure, PCOSI had requested that AENV hold in abeyance PCOSI's original water withdrawal application in the unlikely event that it encountered problems with the use of the ACR water, particularly in Phase 2, when PCOSI would be introducing a gasification unit. In this situation PCOSI stated that it would come back to AENV for some part of its requested water licence to alleviate any problems. PCOSI acknowledged that AENV had not confirmed if it was willing to hold its water licence application in abeyance.

PCOSI did not accept NESICL/CFRD's proposed condition to restrict further water withdrawals from the North Saskatchewan River. PCOSI argued that there was no scientific justification for imposing such a condition and noted that in the Water Management Framework, AENV had concluded that the volume of flow in the river downstream of Edmonton was not currently under stress and provided capacity for net withdrawals to support considerable growth. Most water allocation volume was returned to the river; net withdrawals constituted a very small fraction of river flow.

PCOSI noted that it was aware that selenium had recently been found in the process water discharge from the Shell Scotford upgrader. PCOSI stated that it was investigating other operations with similar processing schemes to determine if they too had problems with selenium. PCOSI stated that if it were confirmed that selenium was present in its wastewater, it would take measures to reduce the selenium down to acceptable levels before returning the water to the ACR treatment plant. PCOSI stated that it had no plans to monitor selenium concentrations in the North Saskatchewan River, as its approach was to remove the selenium prior to water release to the river.

PCOSI stated that it had drilled 42 wells to evaluate the hydrogeological conditions of its lands and that it had also reviewed information on all existing water wells within 3.2 km of the project development area. PCOSI concluded that the dominant hydrogeological unit under the upgrader lands was a low-permeability clay-till unit that was not used as a source of groundwater. Groundwater flow velocities through this unit were very slow because of its low hydraulic conductivity, in the range of only 0.1 m per year. PCOSI noted that the majority of water wells in the area were completed in sandstone bedrock underlying the clay-till unit; therefore, the clay-till units actually provided a protective cap over the bedrock aquifers from potential surface contamination. PCOSI noted that it would install monitoring wells immediately downgradient of all major processing and storage units to detect any changes in groundwater quality.

Given the low flow velocities predicted for groundwater in the area, PCOSI argued that any potential contaminants entering the groundwater would be detected and remediated well before they reached the perimeter of PCOSI's lands. PCOSI also noted that based on its determination of the hydraulic gradient for the upgrader lands, it appeared that there were no off-site wells downgradient from the upgrader's major facilities. In addition to its technical assessment of local hydrogeological conditions, PCOSI noted that it would have in place a comprehensive spill response procedure to protect soil and groundwater in the event of a spill. As a result, PCOSI argued that NESICL/CFRD's requests for additional groundwater protection and monitoring were unnecessary. Furthermore, PCOSI stated that it was not prepared to test NESICL/CFRD wells periodically, nor was it prepared to establish a contingency fund to provide clean water for any landowner whose domestic well might be affected. PCOSI noted that it was committed to protecting groundwater and would mitigate any groundwater quality impacts from its operations.

PCOSI noted that the map contained in Hydrological Consultants Ltd.'s report had led to some confusion. PCOSI pointed out that the scale of resolution was quite coarse and that a closer inspection of the map revealed that PCOSI's proposed project would be located on lands that were low risk for groundwater contamination because of low surface permeability. PCOSI noted that the lands that were identified as high risk were on the northern portion of its property, where no major processing or storage facilities were planned.

PCOSI committed to install a groundwater monitoring well on the Shaws' lands. While PCOSI reiterated that the groundwater tended to flow towards the river and that the Shaws' lands were upgradient of the proposed upgrader, PCOSI acknowledged that putting a groundwater monitoring well to the west of its project lands would enable PCOSI to track any contaminants entering its lands from the west. In response to the Shaws' request for PCOSI to test their water wells, dugouts, and trout ponds, PCOSI agreed to a limited amount of testing prior to and after start-up.

9.2 Views of NESCIL/CFRD

Based on phone conversations with the North Saskatchewan River Watershed Alliance office and the office of the Deputy Minister of the Environment, NESCIL/CFRD concluded that an in-stream flow needs (IFN) assessment had not been conducted for the North Saskatchewan River. NESCIL/CFRD argued that no further water withdrawals from the North Saskatchewan River should be permitted until an IFN assessment had been conducted and the health of the aquatic ecosystem determined. NESCIL/CFRD stated that it believed the river was overallocated and that water usage was much greater than that stipulated by the licensed amounts set by AENV.

NESCIL/CFRD believed its groundwater would be contaminated by runoff from the proposed upgrader. NESCIL/CFRD noted that a regional groundwater assessment by Hydrogeological Consultants Ltd. for Sturgeon Country indicated that there was a very high risk of groundwater contamination in the vicinity of the project.

9.3 Views of the Shaws

The Shaws argued that as farmers they were dependent on water and they were concerned about the impact the proposed upgrader could have on its quality and quantity. The Shaws requested PCOSI to test their water wells at least twice a year, install a piezometer or groundwater monitoring well on the south boundary of their property, and supply training in reading water quality data. Further, the Shaws submitted that PCOSI should plug and abandon unneeded water wells on its lands. This work should be warranted and stamped by a professional geologist and this should be a licence condition under AENV's approval. The Shaws also requested that if their well water quality or quantity were compromised, PCOSI should supply water as needed until normal conditions resumed and the source of the problem was confirmed. The Shaws requested further water monitoring for their property's dugouts and trout ponds. The property should be sampled monthly during the free water period and the parameters of the monitoring program should be determined by the Shaws, AENV, and PCOSI and be written into AENV's approval for the facility. The Shaws acknowledged the commitments made by PCOSI regarding water quality monitoring, but did not believe them to be sufficient.

9.4 Views of the Board

The Board notes that jurisdiction for water allocation rests with AENV under the *Water Act*. The Board notes that AENV has developed a Water Management Framework for the AIH and the Capital Region. The Board notes that the framework document

- recognizes concerns regarding the quality and quantity of water in the North Saskatchewan River;

- recognizes that increasing demands will be placed on the river from current and proposed industrial development, including the upgraders;
- acknowledges that there is a need to take measures now to ensure the quantity and quality of water for future generations;
- outlines a plan for ensuring that future demands will be met;
- specifies how projects currently in the regulatory queue will be dealt with; and
- states that at this time there are adequate water supplies to meet current demands.

Given the Water Management Framework, AENV's conclusions that the volume of the river downstream of Edmonton is not currently under stress and provides capacity for net withdrawals to support considerable growth, and the fact that NESICL/CFRD provided no evidence in support of its allegations that the North Saskatchewan River was overallocated and that water usage exceeded licence limits, the Board is not prepared to recommend to AENV that PCOSI's water licence application be denied.

Based on PCOSI's drilling program and assessment of existing water wells, the Board accepts that PCOSI has a clear understanding of the hydrogeological conditions of its lands and that its proposed monitoring wells and spill response plans will adequately protect groundwater in the region.

The Board acknowledges PCOSI's commitment to protect groundwater and to mitigate any groundwater quality effects from its operations.

The Board accepts PCOSI's evidence that the majority of water wells in the area were completed in sandstone bedrock underlying the clay-till unit, which will provide a protective cap over the bedrock aquifers from potential surface contamination. The Board also accepts that the Shaws' water well is upgradient from its site and that there are no other wells downgradient from the site. Accordingly, the Board does not believe that there is any need to require the testing of water wells.

With respect to the Shaws' dugouts and trout ponds, the Board will condition PCOSI's approval to require it to test the quality of water in the dugouts and trout ponds prior to start-up for purposes of establishing a baseline.

10 SOIL

10.1 Soil Salvage, Storage, and Reclamation

10.1.1 Views of PCOSI

PCOSI stated that 96 per cent of the principal development area (PDA) was modified in the past for agricultural use, residences, roadways, and industry. PCOSI noted that it held about 36 quarter sections of land and that the proposed upgrader footprint covered about eight quarter sections of that land. PCOSI noted that it was continuing to develop reclamation and conservation measures that would involve the salvage and stockpiling of soil resources to

provide adequate materials for returning the land to predisturbance land capability. PCOSI stated that it was continuing to work with AENV to determine appropriate subsoil salvage plans.

PCOSI proposed that during operations, salvaged topsoil would be stockpiled in strategically placed and configured berms to mitigate off-site noise and light impacts. PCOSI recognized the value of these soils and committed to ensure that they were adequately stripped, salvaged, stockpiled, and preserved. PCOSI noted that its current soil stockpile configuration and railway spur now extended outside of the local study area. PCOSI stated that it was undertaking further work with respect to characterizing the soils in that area and committed to submit that information.

PCOSI noted that the long-term effects of storage of topsoil in stockpiles was not well understood and suggested that based on a 1990 reference, any adverse consequences should be readily amended by common agronomic practices. PCOSI indicated that as a result of the revised stockpile configuration, the surface area of stored topsoil would be increased and the depth reduced to increase the long-term integrity and quality of the soil for reclamation. The details of the new stockpile configuration had not been finalized, and PCOSI committed to provide this information to AENV as part of a revised Conservation and Reclamation Plan. PCOSI committed to comply with all soil salvage and stockpiling requirements imposed by AENV.

PCOSI committed to reclaiming the PDA to equivalent capability after decommissioning the project. Furthermore, should best management practices and regulatory requirements change over time, PCOSI committed to incorporate such developments in its plans in consultation with the appropriate regulatory agencies to ensure successful realization of end-land-use objectives.

10.1.2 Views of NESICL/CFRD

NESICL/CFRD argued that it was not in the public interest to locate the proposed upgrader on prime agricultural land when more suitable, poorer soils areas were abundant to the north and east of Sturgeon County. It said that the proposed upgrader should be moved to lesser quality lands.

NESICL/CFRD submitted that the soil salvage plan proposed by PCOSI was inappropriate to ensure the ability of the land to support potato crops in the future. It submitted that the upper subsoil in the areas classified as solonetz soils should be salvaged, as upper subsoil salvage was essential to meeting predisturbance soil quality.

NESICL/CFRD provided evidence to suggest that based on studies more recent than those cited by PCOSI, the loss of topsoil quality resulting from soil stockpiling could be greater than PCOSI acknowledged. NESICL/CFRD noted that PCOSI had changed its stockpile plans considerably and had not provided any details for review. NESICL/CFRD expressed a desire to examine the proposed changes in greater detail when they were available.

Ms. Collier noted that she would like to see the land reclaimed to predevelopment condition and quality. She suggested that the land be preserved as farmland for food production after the life of the upgrader. She also suggested mitigation measures for deacidification and degradation of the soil should form part of any approval.

10.1.3 Views of the Board

The Board notes that PCOSI's proposed development is located within an area of prime agricultural lands, which has been zoned for heavy industrial development. The Board notes PCOSI's commitment to provide additional soil information related to the new topsoil stockpile configuration and railway spur. The Board notes that PCOSI has also committed to provide information resulting from further soil characterization work and expects PCOSI to provide this information to AENV.

Given PCOSI's plans to store and conserve topsoil, the Board believes the area could be returned to agricultural use in the long term. The Board notes that PCOSI is taking steps to meet AENV soil conservation and reclamation requirements and is continuing to work with AENV to finalize its subsoil salvage plans. The Board recognizes PCOSI's commitment to meet the reclamation criteria at the time of decommissioning. The Board notes that soil conservation and reclamation fall under the jurisdiction of AENV.

10.2 Soil Monitoring

10.2.1 Views of PCOSI

PCOSI stated that it had no specific plans to establish a soil monitoring program on non-PCOSI land surrounding the project area. PCOSI believed that any changes to soil parameters from air emissions would be the result of cumulative emissions from a variety of industrial sources in the region. PCOSI recommended that a regional monitoring program be initiated in which it would be a participant. PCOSI suggested a regional monitoring program would be best coordinated by the NCIA or AENV, similar to the FAP program. PCOSI also agreed to monitor soil on the Shaws' land for a limited time.

10.2.2 Views of NESCIL/CFRD

NESCIL/CFRD expressed concerns about the lack of a soil monitoring program, even though PCOSI stated that it would participate in a regional monitoring initiative. NESCIL/CFRD emphasized that background information was essential for meaningful monitoring and noted the lack of leadership on the part of an organization to bring together parties to initiate such a monitoring program. NESCIL/CFRD requested that the Board condition PCOSI's approval to require it to establish a soil monitoring program for the area surrounding the PDA .

10.2.3 Views of the Shaws

The Shaws wanted PCOSI to undertake long-term soil monitoring on their lands. They suggested that the views of their consultant Mr. Polet should carry significant weight and that his recommendations should be adopted by the Board. The Shaws requested, in accordance with Mr. Polet's recommendation, that soil monitoring be carried out on their lands, following the parameters defined under the *Soil Monitoring Directive* (AENV, May 1996).

10.2.4 Views of the Board

The Board recognizes that the interveners had concerns about the lack of soil monitoring in the area. The Board notes that PCOSI has committed to monitor the soil on the Shaws' land. The

Board expects PCOSI to work with the Shaws and Mr. Polet to determine an appropriate soil monitoring plan for their lands. The Board agrees with PCOSI that changes to soil parameters would be the result of cumulative emissions from a variety of industrial sources in the region.

The Board recognizes that there is significant industrial activity in the region and more is planned. The Board agrees with PCOSI and NESICL/CFRD that a regional soil monitoring program is necessary. The Board notes that it has recommended that AENV consider implementing a terrestrial monitoring program in Section 7.2.5. The Board expects PCOSI to actively participate in any regional terrestrial monitoring program that is established.

11 VEGETATION

11.1 Views of PCOSI

PCOSI believed that its approach to vegetation sampling and rare plant surveys was appropriate. PCOSI noted that it captured the great majority of species and that additional sampling sites would not have improved its basic knowledge of the community structure and species diversity at its site. PCOSI believed that the vegetation information provided by NESICL/CFRD could not be compared to its lands because it was from a parkland area and not cultivated land.

PCOSI noted that its currently proposed project footprint now extended outside of the local study area. Background vegetation information had not been provided to the regulatory agencies for the newly proposed disturbance area. PCOSI stated that additional rare plant and wetland surveys were being conducted within the proposed footprint of new topsoil berming, and it committed to provide that information.

PCOSI agreed to undertake some level of vegetable sampling for the Shaws and indicated it would be guided by experts in that respect.

PCOSI acknowledged that lichens and bryophytes acted as excellent indicator species for effects of air emissions. Instead of studying lichens and bryophytes directly, PCOSI studied predictions of regional air quality conditions to identify potentially affected lichen communities.

11.2 Views of NESICL/CFRD

NESICL/CFRD provided information related to vegetation in the Blackfoot Provincial Recreation Area, located about 25 km away from the proposed PCOSI development, and suggested that the flora in that area were quite enriched. Its consultant Dr. Timoney acknowledged that the Blackfoot Recreation Area included uplands of native aspen, balsam poplar, and mixed wood forests and trails, ponds, and small lakes. He also acknowledged that the PCOSI lands were primarily agricultural.

NESICL/CFRD questioned the methods used by PCOSI in its vegetation assessment and suggested they were reconnaissance at best. NESICL/CFRD suggested that PCOSI misunderstood the purpose of a rare plant survey versus a vegetation survey. Specifically, it noted that using rare plant survey techniques to assess the vegetation and to provide a description of the characteristic vegetation types across a study area was inappropriate.

Dr. Timoney criticized PCOSI for not studying lichens directly. He also provided information related to how lichens in Strathcona County, some distance from the proposed PCOSI development, were showing signs of stress from air pollution. NESICL/CFRD maintained that lichens were known indicators of air quality, as they were sensitive to air pollution.

Ms. Collier wanted PCOSI to complete a representative and adequate biodiversity baseline study of the PCOSI property prior to any decision by the Board.

11.3 Views of the Shaws

The Shaws expressed concerns about the impacts of the proposed development on their vegetable garden. Mr. Polet recommended that PCOSI sample the Shaws' garden vegetables one year prior to operations and two years post-operation, at which point the monitoring could be reevaluated.

11.4 Views of the Board

The Board recognizes that there is an information gap associated with vegetation information for the newly proposed disturbance area resulting from the reconfiguration of the soil stockpiles and the railway spur. The Board notes PCOSI's commitment to provide this information and expects PCOSI to provide the information to AENV.

The Board notes that PCOSI was unclear on whether its vegetation sampling protocol captured all vegetation species in the project area. Although PCOSI stated that it sampled only the majority of species, it also stated that it conducted sampling until it identified no new species. PCOSI noted that its sampling was sufficient to provide a basic knowledge of community structure and species diversity.

The Board does not believe that Dr. Timoney's work, conducted some distance away from the project site in a provincial recreation area, is relevant. The Board believes that it would be reasonably expected that there would be greater biodiversity there than in a primarily agricultural area like the proposed site.

The Board notes Dr. Timoney's criticism of PCOSI's vegetation sampling protocol. However, the Board also notes that vegetation sampling was done in accordance with the requirements of the EIA and that as the responsible agency, AENV has declared the EIA to be complete. Therefore, the Board accepts that PCOSI has undertaken an appropriate vegetation assessment.

The Board expects PCOSI to meet its commitment to work with the Shaws to determine an appropriate vegetable sampling protocol.

12 WEED AND PEST MANAGEMENT

12.1 Weed and Pest Management Plan

12.1.1 Views of PCOSI

PCOSI stated that its final weed management plan would include best management practices for the control of clubroot as proposed by the Alberta Clubroot Management Committee. PCOSI committed to follow any provincial or municipal weed management requirements, particularly with respect to the control of noxious and restricted weeds. PCOSI acknowledged the potential threat posed by agricultural pests and committed to work closely with regulators on soil management plans.

12.1.2 Views of NESICL/CFRD

NESICL/CFRD recommended that PCOSI implement a more rigorous weed/pest management plan to enhance prevention and mitigation strategies in consultation with Mr. Groot and Mr. Yarmuch. NESICL/CFRD noted that PCOSI introduced new measures at the hearing to address pest management. It acknowledged that techniques existed to minimize the spread of pests, such as clubroot, but maintained that there was no method to actually prevent the spread. NESICL/CFRD maintained that cleaning equipment would never be a perfect solution and that there was always a potential for spreading weeds and/or pests.

12.1.3 Views of Mr. Smulski

Mr. Smulski raised a concern about clubroot and the negative effect that the presence of clubroot in his fields would cause. He emphasized the importance of reducing the risk of a clubroot infestation.

12.1.4 Views of the Board

The Board notes PCOSI's commitment to meet all provincial and municipal weed control requirements. The Board points out that jurisdiction for weed and pest management falls with the municipalities and Alberta Agriculture and Rural Development. The Board notes the concerns of the interveners and believes that the commitment made by PCOSI to adhere to all provincial and municipal weed control requirements is adequate to address these concerns.

The Board notes that in April 2007 clubroot was declared a pest under Alberta's *Agricultural Pests Act*. The Minister of Alberta Agriculture and Rural Development is responsible for the act, while municipalities are responsible for enforcing it. A landowner and/or occupant is responsible for taking reasonable measures to prevent the establishment of any pest on the land. The Board is of the view that prevention and mitigation are shared responsibilities between the landowners and PCOSI or any other occupant of the land. Specific to PCOSI's proposed development, the Board notes PCOSI's commitment to follow the best management practices for the control of clubroot being proposed by the Alberta Clubroot Management Committee.

The Board notes that it would be prudent for PCOSI, the Groots, and Mr. Smulski to maintain communication with agricultural field men and local municipalities regarding the issue of

clubroot in the area to allow each to take appropriate precautions and mitigation measures through the entire life of the proposed project.

The Board accepts that if these measures are successfully implemented, the risks associated with the establishment of clubroot as a result of PCOSI's proposed activity could be effectively mitigated.

12.2 Potato Cyst Nematode

12.2.1 Views of PCOSI

PCOSI stated that potato cyst nematode (PCN) affected areas had been identified on portions of two quarter sections within the PCOSI lands. PCOSI stated that it was in discussion with the Canadian Food Inspection Agency (CFIA) to develop site construction and operational protocols to salvage and isolate infected soils and minimize the risk of spreading PCN from the quarantined soils via human, equipment, or erosion vectors. Generally, PCOSI intended to stockpile soil and quarantine affected lands where the PCN was identified. PCOSI also committed to ensure that all equipment, tools, and personnel leaving the PCN-affected area and the stockpile accumulation zone (to be built to help prevent the spread of the affected soils) were cleaned, including removal of visible soil and cleaning of the underside of equipment as required.

PCOSI stated that at this time it could not commit to preserving the stand of trees that bordered Mr. Groot's land.

12.2.2 Views of NESICL/CFRD

Mr. Groot was concerned that if PCN spread to his land, his potato operations would be shut down by the CFIA. He emphasized the risk imposed on his livelihood through soil handling on impacted sections of land due to potential spread of PCN. He suggested that regulations to control the pest would be compromised if the soils were moved as proposed by PCOSI.

NESICL/CFRD noted that PCOSI introduced new measures at the hearing to manage the PCN. While these measures were a step forward, NESICL/CFRD noted that there were no specific details for review, and it stated that it would like the opportunity to examine the proposed changes in greater detail once available. NESICL/CFRD recommended that PCOSI not disturb the soil on the PCN-affected areas. It also recommended that PCOSI plant a long-term type of vegetation on the PCN-affected areas that was not conducive to increasing the number of nematodes in the soil. As an alternative, NESICL/CFRD suggested that PCOSI implement measures to determine the presence of PCN in the identified areas and, if present, adjust salvage and respreading measures to ensure that the problem was not spread over a larger area upon site closure.

Additionally, Mr. Groot requested that PCOSI preserve the stand of trees bordering the PCOSI fence line and his fence line in northwest 15-56-22W4M (between Mr. Groot's land and the identified PCN-affected area). Mr. Groot said that the stand of trees was home to deer, moose, coyotes, and a great horned owl nest and was in the "buffer area" of PCOSI's proposed upgrader.

12.2.3 Views of the Board

The Board recognizes the threat posed by PCN and acknowledges that PCOSI is currently in discussion with the CFIA to develop site construction and operational protocols to salvage and isolate infected soils to prevent the spread of PCN from the quarantined soils. The Board notes that jurisdiction for PCN is the responsibility of the CFIA, and the Board expects PCOSI to adhere to any requirements imposed by the CFIA.

The Board notes NESCIL/CFRD's request to review PCOSI's revised PCN management program and expects PCOSI to provide this information to NESCIL/CFRD once this information becomes available.

The Board also notes Mr. Groot's request to preserve the stand of trees bordering his land and the PCN-affected area. Although it is unlikely that this area will continue to be inhabited by wildlife given the industrial development proposed for the region, the Board believes that this stand of trees may be beneficial in helping prevent the spread of the nematode and that its preservation should be discussed with the CFIA. The Board accepts that if PCOSI's proposed measures are successfully implemented, the risks associated with PCN as a result of PCOSI's proposed activity could be effectively mitigated.

13 NOISE

13.1 Views of PCOSI

PCOSI stated that it had completed a noise impact assessment (NIA) as part of the project's EIA based on the 1999 edition of *Directive 038: Noise Control Directive User Guide*. PCOSI also stated that it would complete an additional NIA that took into account detailed project design decisions to refine mitigation measures and ensure that the project complied with the February 2007 edition of *Directive 038*.

PCOSI indicated that it would comply with both *Directive 038* and the regional noise management plan (RNMP) being developed by the NCIA. PCOSI confirmed that it would conduct a post-construction noise survey under the requirements of the February 2007 edition of *Directive 038*.

PCOSI acknowledged the recommendations made by NESCIL/CFRD's noise consultant, Mr. Farquharson, and noted that many of his recommendations were already required as part of *Directive 038*.

PCOSI stated that it had taken steps to mitigate the potential noise impacts of its project, including the following:

- PCOSI committed to pour piles in place where practical and create berms to significantly decrease the noise levels normally associated with operation. Berming had been increased to nearly surround the perimeter of the developed area to address stakeholder concerns.
- PCOSI reevaluated rail facilities to further mitigate noise and modified the alignment of the railway to replace the original loop concept with a straight railway.

- PCOSI would not operate loud equipment in the evening during construction and did not anticipate construction to run 24 hours a day unless a deadline could not be met.
- PCOSI committed to installing silencers on vents.
- PCOSI would develop noise specifications for inclusion in the equipment selection and procurement process.
- PCOSI would continue dialogue with other existing and proposed area facilities regarding environmental noise and would actively participate in an industry area environmental noise program.

PCOSI agreed to NESICL/CFRD's request to report to the community and the Board on how compliance would be achieved including the results of a post-construction noise survey conducted in accordance with the February 2007 edition of *Directive 038*. PCOSI did not commit to have vendor prequalification noise testing because it expected its vendors to meet the specifications supplied. PCOSI acknowledged that the Shaws would hear different noises than they heard now, but it would not commit to the Shaws' request for air conditioning units as a noise mitigation measure.

With respect to its proposed work camp, PCOSI stated that one of its camps would likely be located in the northeast quarter of Section 15, about half a kilometre from its property line and 1.6 km from Mr. Groot's residence. The camp would likely have three 900-kilowatt generators installed to provide power, two of which would be operating and one of which would be on standby. Silencers and remote radiators would be used to reduce noise levels. PCOSI stated that it had modelled the sound level contribution from all of the camps' generating units, and its modelling showed that these generating units would not result in any perceptible noise impact at any of the surrounding residences, including Mr. Groot's. PCOSI noted that NESICL/CFRD's estimate of the noise impact from the camp was not based on the design that PCOSI was proposing and was, therefore, incorrect.

PCOSI rejected the possibility of bringing in power by wire to replace the need for camp generators as a noise mitigation measure. PCOSI stated that its contractors were concerned about having wires around the plant pylons and poles at the beginning of the project when the site was being levelled. However, PCOSI stated that it had not yet decided if towards the end of construction when the main civil works had been completed, it might connect the work camps to the electricity system, which would remove the need for generators and further lessen any noise impacts.

13.2 Views of NESICL/CFRD

NESICL/CFRD's noise consultant, Mr. Farquharson, noted that PCOSI modelled its facility as a single-point source based on measurements taken at a like facility. He stated that PCOSI disclosed very little information with respect to the measurements, including the facility at which the measurements were taken. Mr. Farquharson noted that there were two methods available to measure noise from the facility but he could not confirm which method was used. Mr. Farquharson concluded that the most likely approach used by PCOSI was the near field acoustics approach, and he did not believe that the alternative far field methodology was used.

Mr. Farquharson argued that PCOSI's methodology was appropriate when dealing with more compact noise sources having uniform noise emissions. Mr. Farquharson noted that the measurements used to model the facility as a single-point source were susceptible to weather conditions, facility operations, shielding, and the effects of the ground that may lie between the noise sources of the facility and measurement location. Mr. Farquharson also noted that the height at which the measurements were taken would also impact the facility's noise profile. The above impacts on the measurements would be true regardless of whether the near field acoustics or far field approach were used. Mr. Farquharson concluded that both methods could lead to variance in the result.

Mr. Farquharson undertook his own analysis and used the sound power level provided by PCOSI. He modelled noise impacts at the site of the project for noise emission heights of 5 and 10 m, with and without the topsoil storage berm. Mr. Farquharson noted that his results also showed a great deal of variability. According to the model he used, the 5 m source height berm increased the noise. Mr. Farquharson stated that he had serious concerns with respect to this berm and its ability to reduce noise at NESCIL/CFRD members' homes.

Mr. Farquharson indicated that the February 2007 edition of *Directive 038* required the applicant to add the ambient sound level to the predicted level of the facility. When he added the ambient level to the predicted facility noise level, there were many more exceedances of the permissible sound at the receptors than indicated in PCOSI's NIA. NESCIL/CFRD also noted that there would be an increase in the ambient noise level due to increased rail traffic during the construction and operation of the facility. NESCIL/CFRD requested that the Board require PCOSI to use the best available coke gasification technology, which would minimize rail traffic and as a result reduce noise impacts. Mr. Farquharson identified further deficiencies, including the exclusion of C-weighted values, no assessment of low-frequency noise impacts, and the need for more comprehensive noise data. As a result, Mr. Farquharson concluded that PCOSI's NIA did not meet the requirements of the current *Directive 038*.

Mr. Farquharson also modelled the noise associated with PCOSI's proposed construction camp. Assuming a 3000-person work camp located about 1100 m from the Groot residence and consisting of five 2 megawatt generators, Mr. Farquharson concluded that the noise level at the Groot residence would be over 40 decibels energy equivalent (dBA Leq) and was a cause for concern. Mr. Farquharson believed that PCOSI, as a condition of approval, should be required to install power lines to the camps to replace PCOSI's proposed use of generators. He believed that since heavy equipment at mining operations was able to be operated using wires from the grid, PCOSI should be able to do the same.

NESCIL/CFRD requested that the Board's approval of the project be conditional on PCOSI meeting Mr. Farquharson's recommendations, which included that PCOSI redo the NIA.

13.3 Views of the Shaws

The Shaws cited noise pollution as a stressor and requested that air conditioning and air filtering be provided to them as a mitigation strategy so that they could keep their windows closed.

13.4 Views of the Board

The Board acknowledges NESCIL/CFRD's concern that the NIA submitted by PCOSI was reviewed in accordance with *Interim Directive 99-8 (ID 99-8)*, the requirements in force when the application was submitted, rather than the requirements in *Directive 038* released on February 16, 2007. The Board notes that permissible sound levels (PSLs) remain the same in both versions. The difference between these versions with respect to NIA requirements is that the February 2007 edition requires the addition of ambient noise (35 dBA Leq) to the predicted noise levels. If ambient noise were accounted for, the PCOSI noise predictions at the two most impacted residences would increase to 41.2 dBA Leq from 40 dBA Leq, resulting in a PSL exceedance of 1.2 dBA.

The Board also recognizes NESCIL/CFRD's concern that the noise model methodology used by PCOSI was based on a single-point source estimated by measurements obtained from an analogous facility and that this methodology is subject to uncertainty in noise level predictions. The Board notes that the model results indicated that noise levels would reach but not exceed the PSL of 40 dBA Leq at two residences. PCOSI estimated the inherent uncertainty in the model methodology of 1 to 2 dBA. Consequently, the Board believes that the potential risk for exceeding the PSL was similar to including ambient noise and that the need for a post-construction comprehensive sound level (CSL) survey exists in either case.

The Board notes that the NIA submitted with the application was prepared in the absence of engineering and design details and accepts NESCIL/CFRD's recommendation that PCOSI be required to resubmit an NIA after detailed design. The Board also recognizes that PCOSI agreed to conduct an NIA based on detailed design data and that additional mitigation measures will be employed to ensure compliance with *Directive 038*. The Board will condition the approval to require PCOSI to submit a revised NIA six months prior to construction that incorporates the following:

- addition of ambient noise to the predicted noise levels;
- all permanent (including power generation) and transient noise from the proposed work camp;
- rail noise directly related to shunting and loading activities within the facility site;
- berm locations and the effect on the predicted noise levels at the most impacted residences; and
- additional mitigation measures to be implemented and the effect on the predicted noise level at the most impacted residences.

The Board understands that the results of the revised NIA may identify additional mitigation measures to ensure compliance with *Directive 038* requirements, or it may be necessary to refine some of mitigation measures included in the commitment list, such as berms, mufflers, and silencers. As such, the Board expects any new mitigation or refinements to the commitments to be clearly identified in the NIA.

The Board notes that PCOSI's noise assessment with respect to the use of generators at the work camps more accurately reflects the proposed design of the camps than the assessment prepared by NESCIL/CFRD. The Board accepts PCOSI's conclusion that the use of generators at the

work camps will be in compliance with *Directive 038* requirements. Given that the Board will condition PCOSI's approval to resubmit its NIA following detailed design and the fact that the final design will incorporate all necessary mitigation measure to ensure compliance with *Directive 038*, the Board is not prepared to require PCOSI to install power lines to the work camps.

The Board expects PCOSI to fulfill its commitment to provide a copy of the NIA to interested stakeholders.

The Board notes that low frequency noise (LFN) and C-weighted sound pressure values are not included in the PCOSI NIA and that NESICL/CFRD believes that the NIA does not meet the requirements of *Directive 038* because the LFN information is missing. The Board notes that *Directive 038* does not require NIAs to have this information, but states that it should be included if available. Therefore, the Board is satisfied that the PCOSI NIA meets the requirements of *Directive 038* without the LFN information. The Board also notes that *Directive 038* requires licensees to follow investigation and measurement requirements in response to LFN complaints.

Noise Mitigation

The Board notes the Shaws' concern that noise is a stressor and acknowledges their request for PCOSI to provide air conditioning and filtering units for their residence as part of a noise mitigation strategy. The Board notes that the requirements in *Directive 038* are for the purpose of controlling environmental noise, not health-related impacts, and it is the Board's view that *Directive 038* requirements such as PSLs are appropriate to not adversely affect indoor noise levels at nearby residences. Therefore, the Board will not require PCOSI to provide the Shaws with air conditioning and filtering units. However, if PCOSI does not meet the PSL at the residences, it must pursue appropriate mitigation measures at the facility or residences as necessary.

Comprehensive Sound Level Survey

The Board notes that PCOSI has committed to conduct a 24-hour CSL survey at the Shaw and Smulski residences one year after the upgrader facility becomes operational. However, the Board believes that the Groot residence should also be surveyed, as the Board believes that these three residences represent the closest and most potentially affected human receptors for noise impacts. Furthermore, the Board believes that conducting the noise survey sooner than the one year proposed by PCOSI would be more appropriate. As a result, the Board will condition PCOSI's approval to require PCOSI to conduct a 24-hour CSL survey at the Shaw, Smulski, and Groot residences three months after start-up. The Board will also condition the approval to require PCOSI to submit results of the survey to the Board and residents surveyed.

The Board is satisfied that conducting 24-hour CSL surveys at these residences to demonstrate that PSLs are not exceeded will address the uncertainty concerns associated with the model methodology and will provide assurance that *Directive 038* requirements will be achieved at all residences near the PCOSI facility.

Regional Noise Management

The Board acknowledges PCOSI's commitment to participate in the RNMP being developed by the NCIA for the AIH. The Board notes that the AIH has a large concentration of petroleum, refining, petrochemical, and chemical processing plants. The Board also notes that the NCIA operates within the AIH and represents more than 27 of the largest industries in this area. Approximately half of the industrial complexes in the area are not regulated by the ERCB and thus are not subject to *Directive 038*. The RNMP will address industrial noise on a regional basis; that is, all operators (ERCB-regulated and otherwise) will participate in a comprehensive program that will manage noise levels and serve as a tool for identifying potential noise issues.

The Board is aware that requirements for the RNMP are specified in *Directive 038* and ERCB approval is required before an RNMP can be implemented. The Board also notes that in all cases input from all affected stakeholders must be incorporated in the formulation of the RNMP. The Board notes that noise concerns from non-ERCB-regulated sources, such as rail and road traffic, will be addressed in the RNMP being developed for the AIH.

14 LIGHT

14.1 Views of PCOSI

PCOSI stated that it was essential for its facility to be appropriately lighted so as to ensure the safety of its workers. However, PCOSI acknowledged that it also needed to ensure that the lighting of its facility did not unnecessarily impact its neighbours.

PCOSI stated that it used American Petroleum Institute (API) 540 and Leadership and Environmental and Energy Efficiency Design 2000 (LEED 2.0) in the design of its facility lighting. PCOSI noted that the use of API 540 and LEED 2.0 would address a number of NESICL/CFRD's recommendations. PCOSI stated that its light assessment predicted minimal light trespass onto neighbouring properties.

PCOSI noted that to mitigate stakeholder concerns with respect to the potential effects of noise and light associated with its project, it had significantly increased the extent of berming along the perimeter of the project. PCOSI noted that its current layout had berms surrounding nearly all of the developed area and would reduce off-site light and noise.

PCOSI submitted that at least one flare could be visible to the Groots. PCOSI stated that the height of the flares was determined by standard flare design, which considered radiation protection for plant workers and dispersion of gases.

PCOSI was not prepared to commit to NESICL/CFRD's lighting recommendations, though it noted that its current lighting design would meet many of them.

PCOSI committed to meet all relevant standards and regulations and to adopt rigorous design for its facility lighting that would control trespass lighting. PCOSI believed that it would be inappropriate for the Board to require a third party to conduct a design and construction review of its lighting design.

PCOSI's commitments related to light were as follows:

- Lights would be shielded to focus light where required and avoid horizontal stray light emission.
- Timer or motion-based lighting would be used in areas where permanent illumination was not necessary.
- Areas or equipment that required night lighting would be located away from the project site boundary.
- Lighting would meet LEED rural residential criteria.
- Incandescent or fluorescent lights would be used for indoor lighting, along with blinds and drapes to block flare and light trespass through windows.
- Buildings, tanks, and rail loading facilities would be located to help ensure minimal impact from light and noise.
- A visual assessment would be conducted at the Shaws' and visual barriers put in place as appropriate.

14.2 Views of NESICL/CFRD

NESICL/CFRD's lighting consultant, Mr. Benya, argued that PCOSI did not meet the EIA TOR. Mr. Benya stated that the application did not adequately assess baseline lighting conditions, did not identify potentially affected people or wildlife, identified in a non-specific way facilities that might impact people or wildlife, and proposed only broad, general mitigation measures without any reference to appropriate standards.

Mr. Benya noted that PCOSI had based its lighting design on the use of LEED 2.0 and API 540 standards. Mr. Benya noted that at the time PCOSI prepared its application, LEED 2.0 was obsolete, as LEED 2.1 was adopted in November 2002 and LEED 2.2 was adopted in October 2005. Mr. Benya submitted that PCOSI did not totally embrace the philosophy of preventing light pollution as described in the LEED's Sustainable Sites Credit 8. Mr. Benya acknowledged that API 540 was applicable for petroleum processing facilities such as PCOSI's and that its recommendations were consistent with the "good practice" of the Illuminating Engineering Society of North America recommendations. However, Mr. Benya noted that environmental issues and mitigation measures were not discussed in the API 540 standards.

Mr. Benya questioned PCOSI's use of using luminance as a measure of how much light was being generated on the site and creating off-site impacts. Mr. Benya explained that luminance measurements, or brightness measurements, applied to a specific object and would result in skewed averages when used for distant sources. As a result, PCOSI's measurements were inaccurate and meaningless. Mr. Benya noted that there were no North American or international standards that supported such an approach. Mr. Benya recommended that PCOSI develop or use another method.

Mr. Benya added that the U.S. Congressional Briefing Science and Technology Committee heard testimony from numerous individuals regarding the adverse effects of outdoor lighting. Mr. Benya stated that the urban and rural light impacts on wildlife included direct mortality, disruption of reproduction, and interference with ecological interaction, such as predation. He

also noted light impacts with respect to humans, which included decreased night environment quality and increased cancer risk due to disruption of circadian cycles.

Mr. Benya made a number of recommendations to reduce light impacts from PCOSI's proposed project, including

- use of lower wattage sources,
- use of shielding, as required by U.S. Green Board Council's LEED standards,
- directional lighting,
- use of red lights instead of white strobes for aircraft obstruction lighting,
- use of warm-coloured lights to reduce the apparent brightness of a light source, and
- a third-party independent review of PCOSI's design to ensure that proper mitigation of light pollution had occurred in all phases of the project.

Mr. Benya submitted that if a proponent incorporated best practices and standards in the construction and operation of its facility, it could have a well-lit, safe site and reduce trespass light to its neighbours. Mr. Benya emphasized that light sources should be shielded, which could be done with little impact upon the design or the application of light.

NESCIL/CFRD expressed concerns about the impact of light pollution from the proposed upgrader. Residents noted that they would have a direct unobstructed view of the proposed project and that this would negatively impact their quality of life and their ability to enjoy evenings out of doors and would be disruptive to their livestock. NESCIL/CFRD requested that the Board condition PCOSI's approval to require that it implement all of Mr. Benya's recommendations.

NESCIL/CFRD also expressed concern about the amount of light associated with project flaring incidents.

14.3 Views of the Shaws

To mitigate the impact of light pollution from the proposed project, the Shaws requested that PCOSI conduct a visual barrier assessment and construct a visual barrier as needed.

The Shaws also noted that another mitigation strategy to reduce light pollution would be to close their doors and windows. As a result, the Shaws requested that PCOSI provide them with air conditioning and air filtering for their home.

14.4 Views of the Board

The Board recognizes that light pollution is an emerging issue in the AIH. The Board believes that similar to noise concerns, it would be appropriate for an area-wide assessment to be done of the impacts of light pollution on surrounding neighbours. The Board recognizes that it does not have jurisdiction over all of the entities involved with NCIA. However, the Board believes that there is an opportunity for NCIA to become involved in this issue and recommends to NCIA that it consider the regional light issue and perform an area-wide assessment. Depending on the

results of the assessment, it may be necessary to take appropriate measures through the design and operation of facilities to minimize these impacts.

The Board also notes PCOSI's commitment to perform a visual assessment at the Shaws' and to put in place visual barriers as appropriate. The Board notes that PCOSI made a number of commitments to address lighting issues in its final plant design and that many of the commitments will address Mr. Benya's recommendations. The Board acknowledges PCOSI's commitment to meet all relevant standards and regulations and to adopt rigorous design for its facility lighting that would control trespass lighting. The Board does not believe a third-party review is necessary, and it is satisfied that PCOSI will continue to evaluate its lighting requirements to minimize the impact on its neighbours.

15 TECHNOLOGY

15.1 Gasification

15.1.1 Views of PCOSI

PCOSI noted that there appeared to be some confusion regarding its plans to incorporate gasification technology for the production of hydrogen.

PCOSI clarified that it was not proposing to construct a coke gasification unit. In its Public Disclosure document, PCOSI noted the possibility of a coke gasifier in the future, not necessarily as part of the Sturgeon upgrader, but possibly as part of a larger industrial facility.

To meet project hydrogen needs, PCOSI stated that it would install an SMR for Phase 1 and a liquids gasifier for Phase 2. PCOSI confirmed that this was the scheme modelled as part of its EIA and that this scheme represented the largest environmental footprint.

Notwithstanding its proposed design, however, PCOSI requested that the Board grant reasonable flexibility to determine at a future date whether to include a liquid gasifier in Phase 2 or replace it with a second SMR, having regard for environmental considerations, future government policy, and economic and technical feasibility. PCOSI noted that this flexibility would allow it to continue to address uncertainties associated with gasification technology without precluding other options. PCOSI requested that it not be required to make a formal amendment application pursuant to the *Oil Sands Conservation Act* if it selected SMR technology over gasification in the future, as the SMR technology had a smaller environmental footprint.

PCOSI clarified that Table 6-1 in its August 2007 supplemental information response showed a direct comparison only between the gasifier and SMR units themselves, and did not reflect the impact of integrating these units within the entire project. PCOSI noted that gasification would have a larger environmental footprint than SMR on a site-wide basis. For example, PCOSI noted that the power demanded by the gasifier would increase CO₂ and NO_x emissions from its cogeneration unit above that required for SMR and that the acid gas produced from the gasifier would need to be treated, resulting in increased SO₂ emissions above those produced from the SMR by about 0.5 tonne per day.

PCOSI did not agree with NESCIL/CFRD's interpretation of North West's assertion that without coke gasification, particulate emissions would be higher due to dust from the handling of coke. PCOSI noted that best-in-class large-scale coking operations managed to reduce or eliminate dust from coke-handling operations. PCOSI noted that it would minimize dust by handling the coke in a wet form wherever possible, it would be discharged from the coker as a wet slurry, it would be handled and crushed as a wet slurry, and it would be conveyed by covered conveyors and stored in a covered building. PCOSI also noted that when the coke was shipped from its site, the loaded rail cars would be sprayed with latex to control dust. It stated that rail companies that would handle the coke were very well versed in handling similar materials, as they shipped enormous quantities of coal to the west coast without dusting problems.

15.1.2 Views of NESCIL/CFRD

NESCIL/CFRD believed that coke gasification was the best technology for the PCOSI upgrader. NESCIL/CFRD noted that based on its interpretation of information filed as part of North West Upgrading Inc.'s application (Application No. 1444141), without coke gasification, particulate emissions from PCOSI's upgrading project would be higher due to dust from handling coke. Furthermore, NESCIL/CFRD stated that if coke gasification were excluded from PCOSI's project, fugitive emissions could increase by as much as 22 tonnes per year. NESCIL/CFRD concluded that coke gasification would decrease project-related environmental impacts because GHGs would be ready for carbon capture and storage.

NESCIL/CFRD noted that in Phase 1 to transport coke off site, a unit train consisting of about 110 rail cars would leave PCOSI's site every other day and approximately every day following completion of Phase 2. NESCIL/CFRD noted the impact this would have on the volume of rail traffic that some of its residents would see crossing the road that led from their properties. NESCIL/CFRD argued that if coke gasification were used, no coke would be produced, eliminating the need to transport coke off site, thereby reducing the increase in rail traffic.

NESCIL/CFRD argued that without coke gasification in Phase 1, the project was not in the public interest, and it requested that the Board impose as an approval condition the requirement that PCOSI implement coke gasification in Phase 1.

NESCIL/CFRD noted that PCOSI was requesting flexibility to reconsider the use of a gasifier in Phase 2 and replace it with a second SMR unit. NESCIL/CFRD stated that there was no material before the Board that indicated where PCOSI intended to install a second SMR and that no modelling had been done to account for the emissions from a second unit. NESCIL/CFRD argued that the emissions of SO₂, NO_x, CO, PM_{2.5}, and VOCs associated with SMR were greater than those associated with gasification technology, based on its interpretation of the information that PCOSI had presented in Table 6-1 of its August 2007 supplemental information response. As a result, NESCIL/CFRD argued against the Board granting PCOSI the flexibility to reconsider use of a gasifier in Phase 2, when the air dispersion modelling and the HHRA in the EIA were based on the inclusion of a gasifier in Phase 2.

15.1.3 Views of the Board

The Board notes that contrary to NESCIL/CFRD's assertions, the North West upgrader did not propose to use coke gasification and the Board did not approve coke gasification. The Board

notes that the North West upgrader will use a liquid gasification technology similar to that proposed by PCOSI. As a result, the Board finds that NESCIL/CFRD's interpretation of comments made by North West with respect to gasification technology and its application to the technology selections made by PCOSI are in error and are not applicable to PCOSI's application.

On further review of the North West evidence referred to by NESCIL/CFRD, the Board finds that the application of coke gasification technology to the PCOSI project would not result in lower dust emissions, lower fugitive emissions, or lower GHGs. As such, the Board does not find that it would be in the public interest to make it a requirement of PCOSI's approval to implement coke gasification. The Board does acknowledge, however, that if PCOSI employed a coke gasifier, it would reduce the need to transport coke off site and this would reduce the volume of rail traffic.

The Board notes that Table 6-1 of PCOSI's August 2007 supplemental information response represents only a partial comparison of gasification versus SMR technology and that this partial comparison has misled NESCIL/CFRD into believing that gasification has a smaller environmental footprint than SMR. As a result, the Board concurs with PCOSI's position that on a site-wide basis gasification relative to SMR would lead to an increase in emissions of CO₂, NO_x, and SO₂.

The Board requires companies to construct and operate facilities that were applied for, and changes to the project require Board approval. Therefore, PCOSI is expected to make application to the Board in the event that it elects to replace its proposed liquid gasifier with an SMR in Phase 2.

15.2 Delayed Coking

15.2.1 Views of PCOSI

PCOSI stated that it chose delayed coking as its primary upgrading process because the technology was safe, proven, reliable and met all applicable regulatory requirements. PCOSI noted that delayed coking technology was used throughout the United States and Canada and that PCOSI had over 40 years of operating experience with delayed coking technology at its Edmonton refinery.

PCOSI acknowledged that hydroprocessing technologies produced a higher yield of synthetic crude oil than delayed coking, but argued that they consumed more hydrogen as well. PCOSI also noted that relative to hydroprocessing technology, delayed coking had lower capital and operating costs, produced less SO₂, CO₂, and NO_x emissions, consumed less water and electricity, and generated less sulphur and waste.

PCOSI acknowledged that delayed coking produced a coke by-product but argued that it was a marketable resource. PCOSI noted that alternative technologies, such as hydroprocessing, also produce a heavy by-product that had to be disposed of either by marketing or by coking.

15.2.2 Views of NESCIL/CFRD

NESCIL/CFRD argued that PCOSI's proposed coking technology wasted bitumen and that it produced a coke by-product. NESCIL/CFRD stated that coke was a low-quality fuel that contained a significant amount of sulphur and large carbon molecules, which made it a very dirty and inefficient fuel source. NESCIL/CFRD noted that while PCOSI argued that its process would produce fewer CO₂ emissions, the coke by-product would be burned by a third party and the CO₂ emissions arising from the burning of the coke should be factored in by the Board in its determination of whether or not the project was in the public interest. NESCIL/CFRD believed that PCOSI should complete a life-cycle analysis on the coke to determine emissions if the coke were subsequently processed elsewhere.

NESCIL/CFRD urged the Board to deny PCOSI's application for delayed coking, as the technology did not offer any improvements in environmental performance or liquid hydrocarbon yield relative to projects such as the Shell Scotford upgrader or North West's upgrader. NESCIL/CFRD requested that the Board instead require PCOSI to install a coke gasification process, as was approved by the Board for North West Upgrading Inc. in *Decision 2007-058*.

15.2.3 Views of the Board

The Board acknowledges that PCOSI has experience with coking technology and that it fits within PCOSI's strategic plans for feedstock choice and product slate.

While the Board recognizes that delayed coking will produce a large volume of coke by-product it notes that PCOSI will market its coke and, therefore, add value to the bitumen. The Board finds that the use of the coke by-product outside of the proposed project is beyond the scope of this review and accordingly declines to direct PCOSI to perform a life-cycle analysis to determine future processing emissions.

The Board acknowledges that PCOSI's liquid hydrocarbon yield will be less than that possible with hydroprocessing technology. However, the Board agrees that delayed coking is less expensive than hydroprocessing, consumes fewer utilities, and produces fewer emissions. Therefore, the Board accepts PCOSI's technology choice for the proposed project.

The Board notes that NESCIL/CFRD requested that the Board deny PCOSI's application for delayed coking and instead require PCOSI to install a coke gasification process, as was approved by the Board for North West in *Decision 2007-058*. The Board notes that North West's application was approved for a liquid gasifier, not a coke gasifier. The Board also notes that denying PCOSI's use of delayed coking would eliminate the production of coke and therefore the request for a coke gasifier is incongruent.

15.3 Flaring

15.3.1 Views of PCOSI

PCOSI explained that while flaring events could occur during start-up, shutdown, and upset conditions, flaring was an essential part of the project's safety systems. PCOSI noted that it had a corporate-wide objective to reduce flaring at all of its facilities. PCOSI noted that the volume of flaring during start-up was currently unknown, but that this volume would be provided to the

community when the information was available. PCOSI noted that prior to start-up it would assess possible nonroutine flaring events using a predictive model. The flaring model would be updated after start-up, based on operational experience. PCOSI committed to submitting pre- and post-start-up nonroutine flaring assessments to the Board.

When flaring could be scheduled, PCOSI committed to flaring between 7:00 a.m. and 10:00 p.m. and to notify all nearby residences. However, PCOSI admitted that nonroutine flaring would likely occur at the proposed upgrader. PCOSI noted that it would be developing a flare management plan to ensure that the AAAQO were not exceeded. PCOSI stated that the flare management plan would be developed with the final design of the facility and it would be submitted to the Board and AHW. PCOSI committed to follow the spirit and intent of *Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting*.

15.3.2 Views of NESICL/CFRD

NESICL/CFRD had concerns about the noise and light pollution from flaring incidents. NESICL/CFRD noted that heavy flaring from the Provident facility could last between one to two hours and occurred once every four to six weeks. During these flaring events, they were unable to reach Provident to determine the cause of the flaring. It also stated that flaring was an issue with Shell's facility. NESICL/CFRD stated that during Shell's major flaring events, which occurred three to five times per year, the light generated was so bright that a newspaper could be read outside at night.

15.3.3 Views of the Board

The Board notes the interveners' concerns about emissions, light, and noise that could occur due to flaring at the proposed upgrader. The Board recognizes that flaring is an essential part of PCOSI's safety systems and accepts that from time to time, it will be necessary to flare. However, the Board believes that in order for emergency flaring to be acceptable, it must be infrequent and short lived. The Board expects that PCOSI will do everything practical to minimize nonroutine flaring and flaring during start-up. The Board acknowledges PCOSI's commitments to follow the intent of *Directive 060* and to notify residents when scheduled flaring will occur. In addition, the Board intends to work with AENV on the matter of the frequency and extent of flaring in the region generally.

The Board believes that it is unacceptable for residents to not be able to contact the facility when flaring or other abnormal conditions exist. Therefore the Board will condition PCOSI's approval to require PCOSI to submit prior to start-up the protocol it will use to ensure that residents are informed of abnormal operating conditions and the manner in which residents can contact PCOSI's plant operators about flaring events.

The Board understands that PCOSI has committed upon final design to submit a flare management plan to the Board and AHW to ensure that air quality impacts from flaring are managed appropriately. The Board will condition PCOSI's approval to require PCOSI, prior to start-up, to submit a flare management plan and to submit a report on the feasibility of using incinerators instead of flares at the proposed project.

16 CUMULATIVE EFFECTS

16.1 Views of PCOSI

PCOSI submitted a cumulative effects assessment (CEA) as part of its EIA. It identified the cumulative effects by first determining project effects and then applying mitigation strategies. The project residual effects were those remaining after mitigation. Each component section in the EIA quantified the residual effect, characterized the magnitude and extent, duration, and reversibility of the residual effects, and assessed the potential for these residual effects to contribute in a measurable way to regional cumulative consequences. Cumulative effects on air, water, and terrestrial features are discussed in previous sections of this report.

PCOSI submitted that construction impacts suggested the need for effective regional planning. PCOSI noted that it was committed to participating in industry and regional initiatives.

PCOSI acknowledged that the cumulative effects of development in the AIH were of concern to stakeholders. As such, PCOSI stated that it had worked and would continue to work with stakeholders to develop a regional approach to reducing impacts, which included working with the multistakeholder groups and participating in regional initiatives, such as the NCIA, Sturgeon Country Industrial Heartland Ad Hoc Committee, North Saskatchewan River Watershed Alliance, and FAP.

16.2 Views of NESCIL/CFRD

NESCIL/CFRD stated that it was concerned about cumulative effects of development in the region, citing that “Environment Canada is concerned about the environmental capacity of the region to handle the cumulative impacts of current and planned upgrader developments in the Alberta Industrial Heartland region.”

NESCIL/CFRD believed that the current CEA process had many shortcomings and that this was evident in PCOSI’s CEA. NESCIL/CFRD believed that the scoping portion of the CEA was a filtering process that excluded too many potential areas of concern from consideration and evaluation. For instance, NESCIL/CFRD stated that PCOSI did not conduct a CEA for the loss of agriculture capability.

NESCIL/CFRD also believed that the CEA should focus on preservation rather than act as an assessment of how much degradation a parameter could withstand or whether that parameter could be rejuvenated to its original condition.

NESCIL/CFRD stated that the existing CEA model assumed that there was adequate baseline information on all or most of the important parameters. NESCIL/CFRD doubted that sufficient baseline information was collected and noted, as an example, that the list of species identified in the study area by PCOSI was incomplete and incorrect. NESCIL/CFRD believed that it was prudent to have a five-year moratorium on further development to allow time for the collection of current and possible past baseline information. NESCIL/CFRD believed that the existing CEA process lacked provisions to compel the proponent, or any other organization or agency, to undertake independent studies to fully characterize baseline conditions. NESCIL/CFRD recommended that companies within the AIH be assessed a fee to pay for the baseline and cumulative assessment needs.

NESCIL/CFRD submitted that the CEA framework also failed to acknowledge the complexity of biological systems.

NESCIL/CFRD also believed that the CEA framework did not allow for consideration or evaluation of available alternatives for the area. NESCIL/CFRD recommended that the CEA framework should be reoriented to an “alternatives assessment,” focused on the need and ethical basis for the project. NESCIL/CFRD submitted a proposed description of an alternative assessment and CEA framework expansion.

16.3 Views of the Board

The Board recognizes that the interveners have a number of concerns with the existing CEA process. The Board notes that AENV has deemed the EIA complete, which includes the CEA. The Board will forward the interveners’ concerns on CEA to AENV for its consideration.

The Board notes that the CEA component of an EIA report documents predicted changes to the environment that might be reasonably anticipated from the proposed activity in combination with other activities. The Board also notes that the CEA is not meant to determine how much degradation a component can withstand, but that it exists to determine whether the adverse impacts associated with the predicted cumulative effects require remedies to prevent or mitigate them.

The Board notes that PCOSI has provided a description of efforts to obtain data concerning the impacts of its project and analyzed the potential outcomes based on the best available information and science and a range of plausible assumptions about the future course of developments. The Board is aware that there is a degree of uncertainty in the results of a CEA and notes that PCOSI has committed to environmental monitoring and responding to unfavourable outcomes, should they arise. In previous sections of this decision, the Board has addressed the cumulative effects of the proposed project on air, water, land, and socioeconomics.

The Board notes that three upgrader applications have been approved for the region, with at least three other projects proposed to be built. The Board understands that this is a significant amount of development in the region. However, the Board is encouraged by the amount of focus on regional development from the Government of Alberta and multistakeholder groups. In particular, the Board acknowledges the Capital Region Integrated Growth Management (CRIGM) Plan and the Cumulative Effects Management (CEM) Framework. The CRIGM Plan is a long-range plan (20 to 50 years) focused on core infrastructure in the Capital Region. The plan’s four priorities include land use, intermunicipal transit, information services, and affordable housing, with a secondary focus on water and waste management, policing, emergency services, social services, recreation, and economic development. The CRIGM Plan will be developed by 2010. The CEM Framework focuses on land, air, and water quality in the Capital Region. The Water Management Framework has three scheduled phases, with the first phase in place by January 1, 2009. The draft land-use framework has six key strategies, with the third strategy focused on cumulative effects. The draft air framework places limits on regional air emissions and will reduce regional emission limits beginning on January 1, 2009.

The Board also recognizes the NCIA, which was created to focus on the impacts of growth in the region. The Board notes NCIA’s involvement with FAP, AIHA, and AENV. The Board also notes NCIA’s involvement with the development of the Water Management Framework,

regional groundwater quality studies, development of an Eco-Industrial Master Plan, support of the AIH VPPP, and development of the RNMP.

The Board expects that the provincial and municipal governments will focus on regional planning issues for the AIH, where a number of upgraders are planned to be built over the next several years. The Board considers it imperative that government agencies and departments address such important issues as infrastructure growth, transportation requirements, land-use conflicts, the environment, public health, social services, and emergency requirements for this region.

17 TERM LIMITS

17.1 Views of the Board

The Board notes that there are a number of initiatives planned or under way for the AIH that may result in new policies, guidelines, and other regulatory changes that could affect industrial development in the region. The Board also notes that development in the AIH has not materialized to the extent anticipated by industry as a result of the changing economic environment. The Board notes that PCOSI, in its letter to the Board of October 22, 2008¹⁰ and its subsequent news release of November 17, 2008¹¹ (after the close of the hearing record), has indicated that plans for the Sturgeon upgrader have been put on hold.

Given the various planning developments under way in the AIH and the uncertainty of PCOSI's development plans, the Board believes that it is appropriate to stipulate a time limit on its approval. As a result, the Board will condition the approval to provide that it expires on December 31, 2010, unless the Board stipulates a later date. The Board expects that should PCOSI require the stipulation of a later date, it will apply sufficiently far in advance of the expiry date that the Board may process the application.

¹⁰“The partners are reviewing the preliminary estimates and are assessing various options for the development of the project, including the phasing of various aspects of the project, with selected options to be reflected in the final FEED report. Once the FEED work is complete, Fort Hills will develop a definitive cost estimate for the selected development option, which will be the basis for the final investment decision by the project partners. At this point the partners contemplate making an investment decision in the near term only with respect to the mining portion of the project and deferring any decision to construct the upgrader portion, which would substantially reduce project costs prior to first oil.”

¹¹“The Fort Hills Energy L.P. (‘The Partnership’) announced today that it will defer the final investment decision on the mining portion of the Project (‘Project’) until a cost estimate consistent with the current market environment can be established. The Partnership now anticipates making a final investment decision in 2009. The Sturgeon Upgrader (‘Upgrader’) portion of the Project will be put on hold and a decision on whether to proceed with the Upgrader will be made at a later date.”

Dated in Calgary, Alberta, on January 20, 2009.

ENERGY RESOURCES CONSERVATION BOARD

<original signed by>

J. D. Dilay, P.Eng.
Presiding Member

<original signed by>

J. D. Ebbels
Board Member

<original signed by>

J. G. Gilmour
Acting Board Member

APPENDIX 1 SUMMARY OF COMMITMENTS

The Board notes that PCOSI has committed to conduct certain activities in connection with its operations that are not strictly required by ERCB regulations or guidelines. It is the Board's view that when a company makes commitments of this nature, it has satisfied itself that these activities will benefit both the project and the public, and the Board takes these commitments into account when arriving at its decision.

The Board expects PCOSI to carry out the commitments or to advise the Board if, for whatever reasons, it cannot fulfill a commitment. The Board would then assess whether the circumstances regarding the failed commitment warrant a review of the original approval. The Board notes that the affected parties also have the right to request a review of the original approval if commitments made by PCOSI remain unfulfilled.

The Board expects that PCOSI will document its progress on its commitments and that PCOSI will file this information with the Board on request.

The Board notes that in some of its commitments PCOSI is proposing to reconsider certain elements of its project design. The Board notes that subject to the nature of the proposed revision an application to the Board may be required.

COMMITMENTS BY PETRO-CANADA OIL SANDS INC.

The following commitments are taken from Exhibit 29, filed by PCOSI during the course of the hearing.

General

- The Sturgeon Upgrader facilities will meet all current and applicable regulations
- PCOSI will apply Total Loss Management auditing mechanisms to the Upgrader
- PCOSI will submit to the ERCB a full suite of biophysical studies associated with development extending outside the original project development area

Stakeholders

- PCOSI will periodically report back to stakeholders a summary of economic benefits received by local, provincial and Canadian suppliers of materials and services.
- Emergency coke storage will be outside
- Solid sulphur will be stored in silos except during emergencies
- Sulphur will normally be stored as a liquid and shipped as a solid
- Appropriate separation distances, screens and buffers between development and surrounding land uses will be implemented wherever practical
- A 300 metre buffer (green) zone is required on either side of Highway 643
- PCOSI is committed to participate in industry and regional initiatives for appropriate local and regional planning
- PCOSI is committed to supporting programs and initiatives aimed at ameliorating Project effects on local service providers
- PCOSI will provide employment opportunities associated with the construction, running, and maintenance of the Project
- Efforts will be taken to address labour market issues such as the attraction and retention of workers

- Recruitment, leadership, and succession planning practices will be evaluated to improve the attraction and retention of workers
- Investment will be made in post-secondary education expansion projects that increase student opportunities in trades and technologies related to the oil and gas sector
- Support will be provided for secondary and post-secondary scholarship programs
- Support will be provided for secondary school youth development programs such as Careers: The Next Generation
- PCOSI is committed to developing a construction personnel housing strategy to minimize the effect of the Project and its construction personnel on housing, including affordable housing, in the regional study area
- Basic emergency and medical services will be provided onsite
- First Aid training will be offered for personnel
- Appropriate emergency equipment will be available onsite
- A Project Construction Plan will be developed
- PCOSI will participate in the NSWA
- PCOSI will participate in the NCIA
- A maximum of 15 days of sulphur production will be stored on a bermed, concrete emergency pad
- PCOSI is studying the feasibility of offsite coke storage
- It is PCOSI's expectation that unoccupied lands will be leased back for agricultural use
- PCOSI is working with NAIT to increase the supply of skilled trades in the Edmonton area and is committed to supporting increased apprenticeship programs
- PCOSI currently participates as a member of the Land Trust Society and will participate fully once the project is approved
- PCOSI will continue to pursue synergies with other industrial facilities in the area where they make business sense
- PCOSI commits to adaptive fogging measures for Phase 2/3 based on experience from Phase 1
- PCOSI will monitor the housing situation through groups like the Sturgeon Economic Development Committee
- PCOSI will evaluate installing a VDU if Phase 2/3 does not proceed
- Throughout the preliminary design and environmental assessment process, PCOSI has and will continue to look for design options and mitigation measures to help minimize project effects.
- PCOSI and the Métis Nation of Alberta have agreed to continue to consult with each other as this project moves forward
- PCOSI plans to produce 3 newsletters in 2008
- PCOSI has and continues to work with stakeholders at developing a regional approach to reducing impacts. This includes participating in the multi-stakeholder working groups
- PCOSI is committed to the principle of continuous improvement. As we proceed through the design phase, we continue to reassess our project execution and look for areas where we can improve and optimize
- PCOSI is committed to working with the communities with regards to siting and other aspects of the proposed camp
- PCOSI may ship sulphur in liquid form thus eliminating the forming and storage all together. Should this occur, PCOSI will discuss the change with the ERCB

- PCOSI will work with Enbridge to minimize the impact of the Enbridge pipeline on PCOSI's neighbours. PCOSI will work with Enbridge from one end to the other to minimize impact on the environment and on the people close to the pipeline
- PCOSI is committed to building a camp for the project in the event that traveller workers are required for the Project's construction. The camp siting decision will be reviewed with the ERCB, Alberta Environment, Sturgeon County, and other affected municipalities.
- PCOSI will have its own camp security and will work with the local police, RCMP, and the Municipality on an ongoing basis to make sure that security is everything it should be
- PCOSI commits to have further discussions with Mr. Hoehn regarding the potential impact of the Project
- PCOSI as part of industry, are in discussion with the Alberta Government to take appropriate preventive measures on terrorism
- PCOSI will carry over its commitments to any third parties
- PCOSI will seek ISO 14001 certification for the upgrader

Noise

- PCOSI will meet ERCB Directive 38.
- PCOSI will install mufflers on all internal combustion equipment
- Berms will be created to buffer residents from operational noise.
- For planned substantial noise-causing activities, nearby residents will be notified
- PCOSI will conduct a noise survey within one year after the Upgrader becomes fully operational
- During construction and operations, noise complaints related to vehicle and heavy equipment traffic will be logged and investigated to access whether they are linked to Project activities.
- PCOSI will make efforts to generally adhere to the following maximum noise levels: Time Period Equivalent Sound Level (Leq),
 - 7AM to 7PM 65 dBA
 - 7 PM to 11 PM 60 dBA
 - 11 PM to 7 AM and all Sundays and Holidays 55 dBA
- PCOSI will participate in the Noise Management Plan being developed by NCIA
- PCOSI has committed to pour piles in place where practical
- PCOSI is committed to a post construction 24-hour comprehensive sound monitoring survey at the Smulski location to ensure compliance with Directive 38
- PCOSI will install a linear rail line instead of a loop
- PCOSI will complete an additional noise assessment during detailed design to identify any potential non-compliance noise levels. This noise assessment will take into account the most up-to-date detailed project design decisions that have been made and will be used to refine the mitigation measures that will be employed to ensure that the facility will comply with the ERCB's Directive 38. PCOSI will, once this assessment is finalized, provide it to interested stakeholders and the ERCB.
- PCOSI will put silencers on vents
- PCOSI will seek community input into the selection of additional receptors for the noise study
- PCOSI will re-complete the noise impact of the proposed project to the community using the much more detailed preliminary design information
- Existing information indicates that the proposed facility or all existing and proposed facilities will collectively require additional noise mitigation measures to comply with the PSLs at one

of the receptors not owned by industry proponents. PCOSI will report to the community on how compliance will be achieved

- Continue dialogue with other existing and proposed area facilities regarding environmental noise and actively participate in an industry area environmental noise program
- Develop noise specifications for inclusion in the equipment selection and procurement process
- Where practical, it is not PCOSI's expectation to have 24-hour construction activities, but there will be times when some activities will have to be undertaken. Those activities will generally not involve noise-generating equipment

Light

- Lights will be shielded to focus light where required and avoid horizontal stray light emission.
- Timer or motion based lighting will be used in areas where permanent illumination is not necessary
- Areas or equipment that require night lighting will be located away from the Project site boundary.
- Lighting will meet LEED rural residential criteria.
- Incandescent or fluorescent lights will be used for indoor lighting along with blinds and drapes to block flare and light trespass through windows
- PCOSI will place buildings, tanks, and rail loading facilities to help ensure minimal impact from light and noise on our neighbours
- PCOSI will be revegetating the berms to try to mitigate the impact of the berms from a visual perspective
- PCOSI will conduct a visual assessment at the Shaws and put in place visual barriers as appropriate

Flare

- When flaring can be scheduled, it will be scheduled between the hours of 7AM and 10PM and all nearby residences will be notified prior to scheduled flaring.
- A flare management plan will be prepared and will be submitted to the ERCB and AHW.
- PCOSI plans to provide an updated upset flaring SO₂ dispersion modeling summary table to Alberta Environment together with an updated model in the 4th quarter of 2007
- PCOSI will follow the spirit and intent of Directive 60
- PCOSI will provide a flaring report to the Shaws and the community detailing expected flaring volumes from the Sturgeon Upgrader
- PCOSI will have monitors on individual flare headers to give pre-warnings of flaring activity
- PCOSI will adopt Petro-Canada's corporate objectives to reduce flaring incidents
- PCOSI commits to submitting its non-routine flaring assessments to the ERCB (pre-start up, post start-up, flare management plan)

Dust

- Dust control measures will be employed at open points where appropriate, including but not limited to conveyor transfer points, rail loading chutes and the emergency storage piles
- In extreme situations, construction activities might be temporarily halted until the dust has passed.
- Permanent access roads will be paved to reduce fugitive dust emissions
- Trucks transporting bulk materials to the site will be covered to prevent dust emissions

- Gravelled temporary access routes and parking lots within the site will be constructed to reduce dust emissions
- Water will be used to control road dust
- Coke conveyors and storage areas will be covered
- The emergency coke storage area will be sprayed with water for dust and fire suppression as needed
- PCOSI's industrial hygiene monitoring program will confirm the efficacy of dust suppression during catalyst changeout. PCOSI will use professional technology companies with experience in dust suppression and control in these kinds of applications

Air

- Stacks must be designed for emissions sampling. The final stack sampling requirements will be specified by Alberta Environment
- No burning of waste is permitted on site
- The sulphur recovery for both Phase 1 and Phase 2/3 will be designed to achieve a sulphur recovery efficiency of 99.9% based on the sulphur to the SRU on an annual average (Long term 99.8%)
- On a quarterly basis, the expected minimum sulphur recovery for both phases is 99.5%
- No compressors will be driven by internal combustion engines
- The sulphur content of the plant fuel gas will be monitored to allow for the calculation of plant wide SO₂ emissions
- The plant fuel gas rate will be monitored to allow for the calculation of plant-wide NO_x emissions
- The individual fuel gas rate to major consumption sources such as the SMR, diluent recovery unit furnaces and the coker heaters will be continuously measured and totalized
- During construction, all vegetation debris will be mulched as opposed to burned to avoid smoke emissions
- A no-idling policy will be introduced to control vehicle emissions
- SRU oxygen enrichment may be used to reduce energy use and improve sulphur recovery for Phase 2/3
- Heaters and furnaces will be fired with a combination of natural gas and plant fuel gas. The sulphur content of the Phases 1 and 2/3 plant fuel gas will not be greater than 50 ppm.
- Low NO_x burners will be used wherever practical to reduce flue gas NO_x emissions and, where practical, the Project will use ultra-low NO_x burners
- Storage tanks carrying sour product will be tied into a vapour recovery system
- Feedback from ambient air monitoring will provide information for improving emission performance
- The steam methane reformer furnace will be fitted with selective catalytic reduction (SCR) to reduce its NO_x emissions)
- All other major furnaces other than the SMR including the coker heaters, the diluent recovery furnaces and the cogen unit will be designed with SCR or flue gas recirculation (FGR) retrofit capabilities or an equivalent system
- NO_x emissions will be better than current guidelines (CCME)
- Carbon monoxide emissions will be minimized by good engineering and operating practices
- No reciprocating engines are planned for the Project, except for the emergency back up power generators and fire water pumps
- If the TGTU trips, there will be an immediate operational response to attempt to restart the unit.

- PCOSI is actively studying third-party processing as a way of reducing sulphur dioxide emissions from fuel gas combustion
- Any variance from the emissions cases modeled in the EIA will be discussed with Alberta Environment
- PCOSI will be installing a continuous monitoring air station as part of the project development
- A leak-detection and removal system will be installed below the base of the tanks as required
- PCOSI plans to provide an updated NO_x dispersion modeling summary table to Alberta Environment together with an updated model in the 4th quarter of 2007
- PCOSI will use the best available economically feasible technologies to minimize particulate matter levels
- Vent gas from the sulphur degassing facility will be routed to the thermal oxidizer
- PCOSI believes that it is prudent to run the BPIP program prior to commencing construction so that the facility design can be checked to ensure that building downwash does not adversely affect the air dispersion. Accordingly, PCOSI will run the BPIP along with CALPUFF and will, at the request of stakeholders, share the results of this program with them.
- PCOSI is prepared to add to the understanding of ozone by additional monitoring, if it makes sense to Environment Canada
- PCOSI will discuss start-up variance in terms of sulphur recovery with the board and with Alberta Environment

FAP

- PCOSI will participate with and support the Fort Air Partnership (FAP) and will participate through FAP in a regional air quality management plan
- From an air management perspective, it may be more important for an industrial station to have an attribution focus rather than a compliance focus. PCOSI is willing to have these discussions with other industries, FAP and AENV to establish priorities for monitoring in this area
- PCOSI will forward Dr. Du's recommendations for station locations to FAP for consideration. If Dr. Du's recommendations are not adopted by FAP, PCOSI will consider installing passive monitors for selective emissions at locations deemed important in Dr. Du's analysis. PCOSI will discuss such installations with FAP, will integrate monitoring data from these stations with the FAP network data, and will be willing to increase its regular funding contributions to FAP to cover the installations and monitoring of these sites. These passive monitoring stations will be left in place for the first several years of operations to track trends in air quality. At the end of that period, decisions on the need for and the nature of additional monitoring would be made based on the results of the monitoring program.
- PCOSI, through its membership of the NCIA, will work with FAP and Alberta Environment to fund whatever air monitoring stations are requested by Alberta Environment and FAP to provide an appropriate air monitoring system for the proposed Sturgeon Upgrader
- PCOSI's participation with FAP through all their future monitoring initiatives, whether it's the expansion of that existing monitoring network or whether it's an expansion into a new area of concern such as the Potential Acid Input and Terrestrial Effects Monitoring, which they have recommended that a study be initiated in the future and they would be willing participants in that as well
- PCOSI will support the ERCB in a review of the Fort Air Partnership should the board request it.

- PCOSI will support FAP on any Alberta Environment initiated programs on VOC monitoring

VOC/PAH

- A LDAR program will be implemented which will meet CCME guidelines as a minimum
- PCOSI will measure trace VOC and PAH emissions and compare these to the values provided in the EIA by conducting initial verification tests (stack survey) for one coker heater, the SMR furnace and one utility boiler. This will occur within one calendar year of start-up of full operation (Phase 2/3).
- Fugitive emissions will be controlled through the installation of low emissivity valves, double pump seals and tankage vapour collection systems (where appropriate)
- All tanks will meet the CCME Codes of Practice for the Control of Fugitive Emissions from Above Ground Storage Tanks
- H₂S and VOC emissions from storage tanks: As detailed engineering progresses and PCOSI has better data on the RVP and actual composition of the liquids in the tanks, PCOSI can make these data available
- PCOSI will conduct an ambient VOC/PAH study before the project begins to use as a baseline comparison with a post-operational study. This will be in conjunction and shared with regional initiatives and stakeholders.

GHG

- Transport pipelines and hot process vessels will be insulated to conserve energy
- Combustion air will be pre-heated wherever practical to increase combustion efficiency
- Thermally efficient heaters, furnaces and boilers will be used
- Energy efficiency and proactive ways to manage GHG will be promoted
- PCOSI will design its facility to be CO₂ capture ready
- PCOSI believes that an integrated approach on CO₂ sequestration is necessary (Industry/Government) and will continue to participate in these efforts
- PCOSI will look at commercial arrangements for the use of CO₂ as part of an enhanced oil recovery scheme.

Water

- The Upgrader will be designed to minimize fresh water use by maximizing recycling.
- Ground water wells will not be used for the Upgrader during operations
- Stormwater from the developed areas of the Project will be captured for use by the Project
- During construction, releases from the Stormwater pond that directly or indirectly enter the river will be monitored for both flow (estimated) and quality (TDS, TSS, pH and COD) on a continuous or batch basis.
- Releases from stormwater ponds that directly or indirectly enter the river will be monitored for ammonia, total phosphorus, cyanide and metal annually and will only be released if it meets discharge water quality limits. This includes water from diked tank areas.
- There will be no deep well injection at the Fort Hills Sturgeon Upgrader Project.
- Storm water collection systems will include silt, sediment, and oil traps to prevent the migration of hydrocarbon in an uncontrolled release event
- All releases of water will be monitored and record
- Coke water will be contained and treated
- The PCSS will be designed for a 1 in 100 year storm event
- The entire area inside dikes will be lined including under tanks

- Sumps in the continuous oily water service will have secondary containment and be designed to allow for inspection for leaks
- A 1 in 100 year storm event will be considered in the design of secondary containment around storage tanks
- The site will be isolated from a runoff perspective by the construction of diversion channels to convey water flow of tributaries around the site and by interceptor berms and swales to direct other overland runoff around the site. The diversion channels will be designed to prevent increased downstream erosion.
- An internal drainage system will be developed to convey runoff from disturbed areas inside the site to the stormwater ponds. At the north development, containment berms will be provided around the last (down slope) boundary of the site to contain runoff for events up to 1 in a 100 year storm
- A water management plan will be in place during construction to reduce the environmental impacts of construction on surface water
- An erosion and sedimentation plan will be implemented for tributary relocation, site stripping and construction to ensure sediment loading in any surface runoff does not exceed pre-development rates
- The diversion channel for Tributary #1 will be constructed with a functional hydraulic geometry that is similar to the existing watercourse.
- A groundwater monitoring system will allow early detection of possible impacts on shallow groundwater due to the operation of the Project
- PCOSI will evaluate the use of high efficiency cooling towers for Phase 2/3
- Air cooling will be maximized as much as practical
- PCOSI will maintain surface drainage for the area surrounding the project
- PCOSI will minimize the risk of groundwater contamination
- Coke storage areas to have concrete floors and water recycle
- If required, ditches to facilitate drainage during construction will be designed for a 1 in 100 year peak flow based on the individual times of concentration for each ditch
- Specific baseline conditions for each monitoring well will be established during the first two years, when groundwater samples will be collected twice per year and analyzed for a broad suite of parameters
- The modified tributaries will be meandering, low gradient channels, and will function as sediment reduction ponds for overflow before they leave the Upgrader lands
- PCOSI's monitoring commitments will include TSS measurements in Tributary 1 and Tributary 2 at the point that they leave the Fort Hills Sturgeon Upgrader lands. The monitoring program will span baseline, the construction phase, and at least 2 years of the operational phase of the project and will include set seasonal sampling dates as well as random sampling immediately following major precipitation events. TSS levels detected during construction and operational phases that fall beyond natural baseline variability will trigger a site review of erosion and sediment control features and corrective actions will be undertaken as required.
- The effluent monitoring program will include phenols and routine parameters including alkalinity, major cations, major anions, conductivity hardness and all nutrients (e.g., ammonia, TKN, nitrates, nitrite). Flow temperature and pH will be measured on a continuous basis. Turbidity, TSS, ammonia, total phosphorous, cyanide, metals, BOD and COD will be measured at regular intervals using composite sampling
- Surface Water Remediation: In the event of operational non-compliance, PCOSI will review and revise on site water management as necessary to remedy the situation

- PCOSI plans to include a discussion of the surface water remediation options to be considered for implementation in the event that an adverse effect is detected as part of the emergency response plan.
- Experienced dewatering contractors will be retained to provide dewatering services
- PCOSI plans to develop a Surface Water Toxicity Reduction Plan for the Upgrader before operations commence and will detail how all surface water is planned to be collected, contained, monitored, and treated as necessary prior to releases in the environment
- Dewatering operations are limited to the construction phase of the project
- Recycled wastewater will be the source of water for the Upgrader and ACR will be the recipient of the effluent
- Permanent monitoring wells will be installed immediately down gradient of all major processing and storage units to detect any changes in groundwater quality. Given the low flow velocities predicted for groundwater in the area, any potential contaminants entering the groundwater will be detected and remediated well before they reach the perimeter of PCOSI lands.
- PCOSI is committed to protecting groundwater and will mitigate any groundwater quality effects from its operations.
- PCOSI will install groundwater monitoring wells upgradient (west side of the plant) to enable PCOSI to track potential contaminants coming onto the site from off-site areas to the west
- If PCOSI determines that selenium is present in the wastewater, then we will take measures to remove that selenium down to acceptable levels before returning that water to the ACR
- PCOSI is committed to a limited amount of quality testing on the Shaws' water wells, dugouts, and trout ponds (prior to and post start-up)
- The construction storm runoff pond(s) must be sized for a 1:100 year 24 hour event

Land

- A spill response plan will be developed and put into place for construction and operations
- All area where there is the potential for spills of chemicals or materials will be designed to contain or collect the spilled material
- Stripping of vegetation and topsoil and the replanting of vegetation will be scheduled to limit the extent and duration of bare soil exposure to rainfall as much as practical
- Soil stockpiles will be protected by sediment control fences
- Long-term stockpiles of soil will be protected using one or more of the following to limit erosion: relatively flat side slopes, erosion control matting, vegetation, or other best management practices
- Soil stockpiles will be monitored to ensure adequate erosion protection. If it determined that adequate protection is not afforded by the erosion measures implemented, additional erosion control measures will be considered
- Undisturbed soils adjacent to soil stockpiles containing solonchic/saline materials will be monitored for the first two growing seasons to assess salt migration. If salts are found to have migrated, remediation techniques/compensation options will be discussed with onsite engineers.
- A site Conservation and Reclamation Plan will be prepared
- Sediment control fences will be placed around the perimeter of construction zones. Check dams with geotechnical fabric will be placed in internal drainage channels to lower flow velocities and promote sediment deposition. Erosion control matting will be used on any slopes greater than 10H:1V in the grassed channels and swales to minimize erosion while the

grass is becoming established. Trenches, silt fencing and flow barriers will be installed to minimize or prevent the movement of sediment from disturbed areas.

- A vegetation control program will be implemented to prevent the introduction or spread of weeds. Nuisance weeds, non-persistent annual weeds or non-native plants will be controlled when densities are judged to affect the establishment of desirable native plants or the integrity of adjacent land use.
- Construction vehicles will be monitored to ensure material is not tracked off site and deposited on adjacent paved access roads. Washing facilities for vehicles will be available
- Where practical, all systems containing hydrocarbons will be designed to allow visual inspection of leaks
- Where practical, all pressurized hydrocarbon piping will be located above ground
- All required employees will receive training in spill prevention, control and reporting and on the sensitivities of the local geography and surface water to spills
- There will be no underground hydrocarbon storage tanks
- Contaminated soil encountered during excavations for construction shall be removed from site and replaced with satisfactory fill material
- Visual barriers such as soil stockpiles and vegetation will be used to reduce light emissions to offsite areas
- Soil piles will be located at least 30 metres from water bodies and potential sources of contamination.
- Tributary 1 will be diverted at the northeast corner of the Project and woody cover will be planted along the realigned watercourse
- A wetland compensation and conservation program will be designed for the Project
- Each month, diked areas, storage tanks, and visible liners will be inspected for signs of leaks or spills.
- Product-transfer areas will be paved with concrete and graded, curbed or diked to contain spills or overfills
- Drainage from diked tank areas will be controlled by a sump and valve located at the low point of the area
- Process units will include strategically placed spill kits
- Salvaged soils will be available for replacement during future site reclamation activities, thereby restoring soil agricultural capability
- A post reclamation monitoring program will be implemented for the first two seasons following revegetation of the Project Area
- Erosion control measures will be implemented to minimize erosion of stockpiles. These measures might include the use of tackifiers, erosion control matting or crimping with certified weed-free straw or hay, as appropriate
- Mitigation measures will be undertaken to protect vegetation, terrain stability, and wildlife and aquatic habitat and to maintain ecological functions
- PCOSI will re-vegetate tributary diversions to ensure sediment in the water discharging to the NSR is reduced
- Process area will be paved with concrete
- PCOSI plans to participate in the development of an NCIA-coordinated terrestrial effects monitoring program that should involve the installation of NO_x and SO₂ passive monitors and wet deposition measurements in control areas and areas with identified critical PAI loads
- Through its membership with NCIA, PCOSI will actively advance the proposed monitoring program to study emission effects on lakes, soils and lichen

- Native vegetation cleared from the PDA will be used as a source of vegetation along diverted tributaries, as feasible. Native transplants will be supplemented with appropriate native shrub and tree plantings, where necessary to achieve pre-disturbance cover values along the channel
- Tributary Diversions: Coordination of reclamation activities with Northwest Upgrading will be undertaken where clear benefits to wildlife enhancement can be anticipated
- All soil stockpiles are designed with 3:1 side slopes (maximum)
- PCOSI commits to progressive reclamation as appropriate
- All tanks will meet the requirements of Alberta Environment's Secondary Containment Guideline for Containers and Above Ground Storage Tanks
- Rare plant surveys will be completed in late summer and results provided to Alberta Environment
- PCOSI is currently collecting additional vegetation samples from home gardens to provide a representation of baseline conditions in locally grown produce to Alberta Environment
- Details on the location of wetlands affected by the Project will be identified in a report on wetland delineation and classification to be completed in Q4 2007
- The SRU design will not include a sulphur pit
- On site spill response kits are available to contain and safety isolate spills. Once a spill is discovered, the spill response will be immediate.
- PCOSI is also continuing to develop reclamation and conservation measures that will involve the salvage and stockpiling of soil resources to provide adequate materials for returning the land to pre-disturbance land capability should this be a future objective
- During operations, salvaged soil will be stockpiled in berms strategically placed and configured to mitigate noise and light impacts off-site.
- In the event of a spill, PCOSI will take measures to recover the spilled product, identify the extent of effects, and remediate soil and groundwater to acceptable levels
- PCOSI will comply with all provincial and municipal weed control requirements, and a final weed management program plan will be developed to meet these requirements. The plan will include Best Management Practices for the control of Clubroot being proposed by the Alberta Clubroot Management Committee.
- PCOSI will discuss with the Canadian Food Inspection Agency, CFIA, site construction and operational protocols to salvage and isolate infected soils and to prevent the spread of nematodes from the quarantined soils
- PCOSI will provide the ERCB with details of the new soil storage plans (configuration, size, aerial extent, slopes, maximum heights, and the schematic comparing the currently proposed configuration with that originally applied for)
- PCOSI is prepared to do a reasonable amount of soil testing for the Shaws (prior to and post start-up). The specifics need to be worked out with the Shaws
- PCOSI is prepared to do a reasonable amount of vegetable material testing for the Shaws (prior to and post start-up)
- PCOSI is committed to reclaiming the PDA study area to equivalent capability after decommissioning of the Project

Wastes

- Wastes will be separated from recyclables
- Storage containers will be in good condition, be compatible with the materials being stored, be closed, labelled, and inspected weekly

- Hazardous wastes and recyclables will be separated from non hazardous wastes and recyclables
- Incompatible wastes and recyclables will not be stored in the same container or in containers that are next to each other unless a dike, berm, wall, or other barrier separates them
- Collection and storage bins will be placed in low traffic areas away from processing area. The bins will be clearly marked and labelled
- All wastes and recyclables will be tracked
- A waste dump will not be provided on site. The land filling of wastes on site is prohibited.

ERP

- PCOSI will enhance call-in/call-out procedures to inform local residents of any abnormal operating conditions
- An Emergency Preparedness and Response plan will be submitted to Sturgeon County
- The Project will meet and conform to the standard industrial health and emergency preparedness practices during construction and operations
- Emergency response staff will receive appropriate training
- PCOSI will cooperate with other industrial sites nearby and the emergency services department of Sturgeon County
- Coordination with NR CAER: PCOSI commits to following the existing community notification protocols that have been established by NR CAER
- PCOSI will investigate alternative communication methods to enhance notification in the Emergency Planning Zone
- A summary of PCOSI's emergency response plan which discusses mitigation plans that PCOSI plans to implement to protect workforce and public safety during preconstruction, construction, and operation and reclamation of the Project will be available by the summer of 2008.
- Any concerns regarding odours reported by residents or noted by plant operators will be addressed by the Shift Team Leaders and Upgrader staff will follow up. If confirmed as an Upgrader issue, appropriate action will be taken.
- PCOSI is committed to ensuring that the Sturgeon Upgrader is the subject of an effective, comprehensive, and thorough Emergency Response Plan, or ERP. PCOSI is also committed to ensuring that its neighbours have an opportunity to review the ERP and have input on how the ERP, including community call-out procedures can be improved. This is an ongoing commitment that PCOSI will honour throughout the life of the project
- PCOSI is currently developing a Construction ERP. This is being developed under PCOSI's Total Loss Management Standards. PCOSI will meet with stakeholders in September of 2008 to review a draft of the plan. The final plan will be available to the public prior to the beginning of construction
- PCOSI will begin the development of an Upgrader site-specific Operations ERP in the fall of 2008. This plan will meet the needs of ERCB Directive 071 as well as CSA 2731-03 and will be finalized for submission to the ERCB in mid 2009. PCOSI will have preliminary consultations with stakeholders concerning emergency response in October of 2008 and further consultations at a later date to review a draft of the operations Emergency Response Plan
- PCOSI will work with its third party partners to ensure that emergency response plans in place for those facilities comply with ERCB Directive 71 and CSA 2731-03 and are integrated with PCOSI's ERP

- PCOSI is committed to working with its stakeholders on an ongoing basis to ensure that the emergency response system employed for the Sturgeon Upgrader is effective and responsive to our stakeholders' needs
- PCOSI commits to a full-scale ERP exercise based upon the worst case scenario during the first year of operation
- PCOSI will work with stakeholders on what their suggestions might be as an appropriate notification program. PCOSI will also work with NR CAER to develop an appropriate emergency notification system. PCOSI will also work with the various responding agencies and the local community to implement an improved emergency response notification system. The improvement plans are to have measurable objectives
- PCOSI will work directly with Mr. Smulski on ERP planning to address his concerns with egress routing
- PCOSI's site specific Emergency Response Plan will include in it communication protocols with local residents. Should something occur which would potentially impact people in our EPZ and EPA, our Emergency Response Plan communication protocol would contact the local residents within those areas and give them advice on what to do.
- PCOSI will allow the Shaws not only to have initial input into the ERP but also to review the ERP and they will have the opportunity to participate in ERP exercises
- PCOSI will provide some training to the Shaws in order to assist them to assess what is and is not, for instance, a catastrophic event—training in what emergency response means
- PCOSI will have people on-site full-time (24-hours a day) with responsibilities to investigate complaints including odour complaints. PCOSI will have contact numbers publicized and give people like the Shaws an information package
- PCOSI will conduct a table top ERP exercise prior to start up

Traffic

- During construction, bus transport will be used to reduce the congestion and emissions associated with individual vehicles commuting to and from the site.
- A construction traffic plan will be developed as part of the project
- Material and equipment deliveries will be scheduled during off-peak hours where practical
- Staggered shift change times will be coordinated with other operators in the area as much as practical to mitigate traffic impacts. PCOSI will monitor traffic and participate in discussions with other operators in the area to minimize impact
- PCOSI will minimize parking for onsite construction workforce.
- PCOSI will maximize equipment deliveries by rail where practicable
- PCOSI commits to highway signage along Highway 643 to alert drivers to the possibility of fogging along the Highway
- PCOSI has worked cooperatively with Sturgeon County on the development of the Transportation Master Plan and will continue to do so as the County implements the plan.
- PCOSI will build an overpass so that traffic on Highway 643 will not be interrupted by rail traffic to PCOSI's upgrader
- PCOSI is in the process of preparing a Traffic Impact Study. It is anticipated that a final study will be submitted to Sturgeon County in July
- PCOSI will work with CN to try to influence when they move rail cars
- PCOSI will recommend to its rail-service providers that they post a schedule publicly on a website so that folks could know when, at least, within a range of time when the trains may be coming
- PCOSI will not transport material across Highway 643 for safety reasons

Historical

- Should any items of historical significance be observed protruding from the ground surface, they will be surface collected
- As Stage 1 mitigation measures, additional assessment and detailed recording will be undertaken for several historic structural sites. These measures will include shovel testing, mapping and detailed photography
- To ensure archeological or historic period sites are not inadvertently affected during the construction and operation phases, workers will be educated on the nature of historical resources and what approach to take if sites are identified.
- If historical resources are encountered during construction and operations, Alberta Community Development will be consulted with and if possible, an assessment will be completed before any direct development activities start
- Stage 1 mitigation will be done and Stage 2 mitigation will be done if required associated with five structural historic sites within the Project area
- An additional field visit to each historical site will be necessary to complete work, which will include further shovel testing, detailed mapping and recording of the larger historic sites and collection of a sample from the refuse pile to help clarify the sites' period of use.

Wildlife

- Tree clearing will be planned to avoid wildlife nesting and denning periods for species of management concern if present and a pre-construction assessment will be done to identify bird nests.
- Monitoring of wildlife along the diverted and revegetated tributary will occur immediately after construction
- PCOSI will investigate the potential for using soil stockpile sites as wildlife habitat enhancement areas. Such enhancement initiatives would only be undertaken where wildlife-project conflicts could be avoided.
- A nesting survey is to be completed prior to a tree, or shrub clearing

APPENDIX 2 APPROVAL CONDITIONS

Conditions generally are requirements in addition to or otherwise expanding upon existing regulations and guidelines. An applicant must comply with conditions or it is in breach of its approval and subject to enforcement action by the ERCB. The conditions imposed on the applicant are summarized below. In the event of any difference between the approval conditions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

- 1) With respect to the risk that could be posed by trains blocking Ms. Cragg from obtaining attention for her medical condition, the Board believes that the matter must be recognized and addressed by PCOSI and its rail service provider in their plans. The Board will condition PCOSI's approval to require that PCOSI satisfy the Board prior to start-up of the upgrader that plans are in place to deal with Ms. Cragg's need for quick egress. (Section 5.2.6)
- 2) The Board acknowledges PCOSI's commitment to conduct a table-top emergency exercise prior to start-up, as well as its commitment to conduct a full-scale emergency exercise based upon a worst-case scenario within the first 12 months of operation. The Board finds, however, that start-up of a facility as large and complex as an upgrader presents its own unique situations that may require an emergency response, and as such the Board expects PCOSI's response capabilities to be fully operational during start-up. Therefore, the Board will condition PCOSI's approval to require it to conduct a full-scale emergency response exercise based on a worst-case scenario prior to start-up. (Section 6.1.5)
- 3) The Board acknowledges PCOSI's commitment to work with NR CAER and the community to develop an appropriate emergency notification system. However, the Board notes that the concerns expressed by residents are similar to those raised in previous hearings. The Board is concerned that an important component of an effective ERP does not appear to be functioning in accordance with the expectations of those most directly affected by it, the residents, and that this problem remains an outstanding, serious public concern. While the Board recognizes that this is not an issue that PCOSI alone can resolve, the Board believes that it is nonetheless appropriate to condition PCOSI's approval to require PCOSI to submit a report prior to start-up on how the NR CAER system has been revised to deal with resident concerns. While the Board recognizes that it does not have jurisdiction over all of the entities involved with NR CAER, the Board intends to contact NR CAER to determine if there are additional steps that can be taken area wide to address resident concerns. (Section 6.1.5)
- 4) The Board understands that despite all the best design features and good operational management, there is a potential for off-lease odours to occur. The Board is of the view that the public who could be affected by odours from the facility should be given a clear and direct protocol from industry of what to do when they detect an odour. As a follow-up to an odour complaint, the Board believes a company must provide an explanation to the public about the incident and what they are doing to prevent further incidents and incorporate feedback from the public on how the protocol could be improved. The Board accepts NESICL/CFRD's recommendation that PCOSI be required to develop an odour complaint protocol. Therefore, the Board will condition PCOSI's approval to require PCOSI to submit prior to start-up the odour complaint protocol it will use at its facility. (Section 6.1.5)

- 5) The Board notes that PCOSI will design its sulphur recovery facilities to achieve a 99.9 per cent sulphur recovery and that it has requested that it be approved to achieve a 99.5 per cent sulphur recovery on a calendar quarter-year basis. Given the total volume of SO₂ emissions in the AIH, it is the policy of the ERCB to require all new upgraders to achieve a minimum calendar quarter-year sulphur recovery of 99.5 per cent. The Board also notes PCOSI's request to achieve its sulphur recovery efficiency within 12 months of start-up. However, it has been the practice of the Board in approving upgrader projects like PCOSI's that the required sulphur recovery efficiency is to be achieved within 6 months of commencing start-up activities. The Board sees no reasons in this case to vary from its usual practice. Therefore, the Board will condition PCOSI's approval to require it to achieve a 99.5 per cent calendar quarter-year sulphur recovery within 6 months of commencing start-up activities. (Section 7.1.5)
- 6) The Board notes that the changes in the design of the facility could impact the fugitive emissions estimate. Accordingly, the Board will condition PCOSI's approval to require it to provide a revised estimate of fugitive emissions, including tank emissions, after the design of the facility has been finalized and prior to start-up to ensure that the original fugitive emissions estimate was reasonable. The Board will also require PCOSI to advise the ERCB on the impacts on air quality and human health from fugitive emissions based on the final detailed design of the upgrader and whether the changes from the original assessment are material. (Section 7.1.5)
- 7) The Board finds that the dispersion modelling assessment completed by PCOSI was satisfactory. The Board notes that the interveners did not express any concern about the modelling approach used by PCOSI other than the exclusion of building downwash. The Board acknowledges PCOSI's commitment to rerun its dispersion modelling using CALPUFF and to incorporate building downwash at the request of the interveners. The Board believes that this is a useful endeavour that will ensure that the conclusions of the air quality assessment will not change once the design of the facility is finalized. Therefore, the Board will condition PCOSI's approval to require it to rerun its dispersion modelling using CALPUFF and incorporate building downwash and to supply its updated modelling to the Board, AENV, and the interveners before construction commences. (Section 7.1.5)
- 8) With respect to the Shaws' dugouts and trout ponds, the Board will condition PCOSI's approval to require it to test the quality of water in the dugouts and trout ponds prior to start-up for purposes of establishing a baseline. (Section 9.4)
- 9) The Board notes that the NIA submitted with the application was prepared in the absence of engineering and design details and accepts NESICL/CFRD's recommendation that PCOSI be required to resubmit an NIA after detailed design. The Board also recognizes that PCOSI agreed to conduct an NIA based on detailed design data and that additional mitigation measures will be employed to ensure compliance with *Directive 038*. The Board will condition the approval to require PCOSI to submit a revised NIA six months prior to construction that incorporates the following:
- addition of ambient noise to the predicted noise levels;
 - all permanent (including power generation) and transient noise from the proposed work camp;

- rail noise directly related to shunting and loading activities within the facility site;
- berm locations and the effect on the predicted noise levels at the most impacted residences; and
- additional mitigation measures to be implemented and the effect on the predicted noise level at the most impacted residences.
(Section 13.4)

- 10) The Board notes that PCOSI has committed to conduct a 24-hour CSL survey at the Shaw and Smulski residences one year after the upgrader facility becomes operational. However, the Board believes that the Groot residence should also be surveyed, as the Board believes that these three residences represent the closest and most potentially affected human receptors for noise impacts. Furthermore, the Board believes that conducting the noise survey sooner than the one year proposed by PCOSI would be more appropriate. As a result, the Board will condition PCOSI's approval to require PCOSI to conduct a 24-hour CSL survey at the Shaw, Smulski, and Groot residences three months after start-up. The Board will also condition the approval to require PCOSI to submit results of the survey to the Board and residents surveyed. (Section 13.4)
- 11) The Board believes that it is unacceptable for residents to not be able to contact the facility when flaring or other abnormal conditions exist. Therefore the Board will condition PCOSI's approval to require PCOSI to submit prior to start-up the protocol it will use to ensure that residents are informed of abnormal operating conditions and the manner in which residents can contact PCOSI's plant operators about flaring events. (Section 15.3.3)
- 12) The Board understands that PCOSI has committed upon final design to submit a flare management plan to the Board and AHW to ensure that air quality impacts from flaring are managed appropriately. The Board will condition PCOSI's approval to require PCOSI, prior to start-up, to submit a flare management plan and to submit a report on the feasibility of using incinerators instead of flares at the proposed project. (Section 15.3.3)
- 13) Given the various planning developments under way in the AIH and the uncertainty of PCOSI's development plans, the Board believes that it is appropriate to stipulate a time limit on its approval. As a result, the Board will condition the approval to provide that it expires on December 31, 2010, unless the Board stipulates a later date. The Board expects that should PCOSI require the stipulation of a later date, it will apply sufficiently far in advance of the expiry date that the Board may process the application. (Section 17.1)

**APPENDIX 3 MEMBERSHIP OF THE NORTHEAST STURGEON COUNTY
INDUSTRIAL LANDOWNERS AND THE CITIZENS FOR RESPONSIBLE
DEVELOPMENT (JUNE 9, 2008)**

Ainley, Ruth and Gordon
Armstrong, Bryan, Irene Hope and Faith
Acton, Jim (Boysdale Camp Foundation)
Brown, Mike, Anne, Stefan, Michelle and Kristian
Callaghan, Patricia
Chichak, Dennis and Maureen
Cholewa, Tim, Cheryl and Bryar
Collier, Barb, Stephen, Erinn and Graham
Craggs, Willoe, Byron Leslie and Matthew Warcimaga
D'Aoust, Charles and Sharon
Diogo & Colten, Caesar, Theresa, Cassandra, Ethan and Liam
Drabble, Florence and Rex
Dzurney, Axel
Ebbers, Ron and Marlene
Fairweather, Rob, Wendy, Callum and Aidan
Groot, Wayne, Luzmaria, Luis and Ana Sofia
Groot, Don and Pat
Groot, William and Bertha
Kiriak, Russ and Stella
Lusk, Susan and Warren
Meijer, Roelof and Marianne
Migneault, Serge
Murray, John
Pratt, John and Lorraine
Prins, Toula and Reg
Prins, Sam and Dora
Prins, Harvey
Radke, Jim and Kathy
Reed, Doug and Mary Anne
Sudayko, Joan and Mike
Swiderski, Rob and Sophie

APPENDIX 4 HEARING PARTICIPANTS

Principals and Representatives (Abbreviations used in report)

Witnesses

Petro-Canada Oil Sands Inc. (PCOSI)
M. Ignasiak
S. Christensen

N. Camarta
T. Halford
Dr. J. Filby, Ph.D.
J. Percic
T. R. Eccles, P.Biol.
M. Davies
B. Koppe, P.Biol.
D. Picard, P.Eng.
M. Ingen-Housz
L. Halsey, P.Geol.

Northeast Sturgeon County Industrial
Landowners and Citizens for Responsible
Development (NESCIL/CFRD)
R. Secord
E. Chipiuk

J. R. Benya
Dr. S. Du, Ph.D.
Dr. C. Hofelt, Ph.D.
J. Farquharson
Dr. K. Timoney, Ph.D.
Dr. D. Blake, Ph.D.
M. Yarmuch, P.Ag.
A. Brown
J. Murray
R. Kiriak
M. Chichak
B. Collier
W. Groot
R. Meijer
W. Craggs
R. Ainley

Shaw Family
D. P. Mallon, Q.C.
V. Alexander

S. Shaw
K. Shaw
M. Polet, P.Biol.
Dr. J. Dennis, Ph.D.

SV Half Diamond Ranch, SV Farms Ltd., Ken
Smulski (Smulski)

K. Smulski

Dr. R. Hoehn

Dr. R. Hoehn, Ph.D.

The Métis Nation of Alberta (MNA)
D. Moore
C. Browning

(continued)

Principals and Representatives
(Abbreviations used in report)

Witnesses

Sturgeon County

D. Rigney
M. Oberg

Town of Gibbons

G. Spitzig

G. Fraser

North West Upgrading (North West)

D. Bertsch

Suncor Energy Inc. (Suncor)

T. Bachynski

Total E&P Canada (Total)

B. Kampala

Shell Canada Ltd. (Shell)

D. Kolenick

Alberta Justice

T. Rothwell
J. Mallet

StatoilHydro

R. Christie
T. Shopik

Alberta Industrial Heartland Association of
Sturgeon County

D. Rigney
N. Shelly

Energy Resources Conservation Board Staff

J. P. Mousseau (Board Counsel)
B. Prenevost (Board Counsel)
B. Germain P.Eng.
K. Siriunas P.Eng.
S. Cartwright
M. Fierro
S. MacDonald
D. Williams P. Eng, Ph.D.

APPENDIX 5 BOARD DECISION, JUNE 19, 2008, MOTION TO COMPEL THE ATTENDANCE OF WITNESSES

June 19, 2008

Via E-mail

Mr. Richard Secord Mr. Keith Purves
Ackroyd LLP 208-95 Avenue
15th Floor, First Edmonton Place Fort Saskatchewan, AB
10665 Jasper Avenue T8L 1C7
Edmonton, Alberta T5J 3S9

Mr. Darin Stepaniuk
Environmental Law Section, Alberta Justice
8th Floor Oxbridge Place
9820 106 Street
Edmonton, AB
T5K 2J6

Dear Sirs:

**RE: Petro-Canada Oil Sands Inc. Application 1490956
Motion to Compel the attendance of Witnesses**

On June 11, 2008 Counsel for the Northeast Sturgeon County Industrial Landowners and the Citizens for Responsible Development (NESCIL/CFRD) filed a motion pursuant to sections 9 and 39 of the *Energy Resources Conservation Board Rules of Practice* seeking to compel three witnesses, Mr. Mike Boyd, Mr. Richard Chabaylo and Mr. Keith Purves to attend the upcoming hearing of the above application. Mr. Boyd and Mr. Chabaylo are employees of Alberta Environment (AENV) and Mr. Purves is the Chairman of the Fort Air Partnership (FAP).

On June 17, 2008 counsel for AENV filed its response to the motion as did Mr. Purves on behalf of FAP. On June 18, 2008 Mr. Secord filed his reply to those responses. The Board carefully reviewed all of the submissions relating to this motion and have asked me to convey its ruling on the motion to interested parties. In ERCB Decision 94-2 the Board set out the factors it will consider when considering a request to compel the attendance of a witness.

For the Board to consider compelling the attendance of a witness, it must be convinced that the evidence which would be adduced is critical for the Board to understand the issues it is charged to address. Further it must be clear that there is no other reasonable way to obtain this evidence. As a result compelling and substantive reasons are needed for the Board to take such action.

The Board confirmed this approach in EUB Decision 95-6 where it stated:

The Board confirmed its view that the party applying for the witness to be called must present substantive reasons why the witness should be compelled to attend and that there are not other mechanisms to obtain the information.

The Board understands from the motion that it is the position of NESCIL/CFRD that the environmental impact assessment (EIA) prepared by Petro-Canada Oil Sands Inc. (PCOSI) for the project is incomplete and based upon flawed information; the NESCIL/CFRD purports to have evidence supporting this position. The Board further understands that the NESCIL/CFRD would like to cross-examine Mr. Boyd on the environmental impact assessment (EIA) review process, including AENV's use of third party consultant's for the review of the EIA, and the decision to declare the EIA complete.

Regarding the attendance of Mr. Boyd, the Board is not convinced that his evidence on AENV's EIA review process is critical to an understanding of the issues raised by the PCOSI application. As the Board understands it, a determination of completeness pursuant to section 53 of the *Environmental Protection and Enhancement Act* reflects that an applicant has met the information requirements for an EIA as described in section 49 of that Act and it is not an endorsement of the EIA's conclusions.

Pursuant to section 3 of the *Energy Resources Conservation Act* the Board is obligated consider whether a project is in the public interest having regard to its social, economic and environmental effects. In this respect the Board's review of PCOSI's EIA in the hearing is entirely independent of AENV's review for completeness.

To fulfill its mandate under section 3 the Board will consider the evidence of PCOSI, as tested by cross-examination by the interveners and examination by the Board and its staff as well as evidence to the contrary that has been similarly tested. In this capacity the Board must rule not only on the sufficiency of the EIA but upon its conclusions as well. When making this determination, the Board is not bound or otherwise fettered by a previous determination of completeness by AENV. Likewise PCOSI's burden of demonstrating to the Board that its project is in the public interest is in no way reduced or otherwise altered by AENV's completeness determination.

The Board notes that the NESCIL/CFRD has addressed the issue of the completeness and accuracy of the EIA in its submissions and will have witnesses present at the hearing to speak further to this issue. In the Board's view this is a more reasonable and appropriate approach to put evidence regarding the completeness and accuracy of the EIA before the Board. As the Board understands it, the NESCIL/CFRD seeks the attendance of Mr. Chabaylo and Mr. Purves to better understand the role of AENV within FAP and to better understand FAP's mandate. The Board further understands that the NESCIL/CFRD believe that testimony from Mr. Purves will be helpful to the ERCB in determining whether an adequate regional monitoring system exists and whether it is in the public interest to approve another upgrader with the current monitoring program in place. The Board understands the impetus for this request to be the NESCIL/CFRD's contention that air quality information provided by FAP, and relied upon by PCOSI in its application is neither comprehensive nor credible.

Again, the Board is not convinced that the evidence of these two witnesses is critical to understanding the issues raised by the application. The critical issue, in the Board's view, is the

credibility and completeness of the air quality evidence relied upon by PCOSI in its application. The NESCIL/CFRD stated in the motion that it intends to present evidence with respect to this very issue, and the Board considers that this is the more reasonable and appropriate approach to having this evidence placed in front of the Board.

In conclusion, the Board is not convinced that the evidence sought from Mr. Boyd, Mr. Chabaylo and Mr. Purves is crucial to its understanding of the issues raised by the application. In the Board's view evidence regarding the sufficiency and accuracy of the EIA, the sufficiency and accuracy of air monitoring information relied upon by PCOSI, and the appropriateness of the FAP monitoring program can best be obtained by the parties to the proceeding including PCOSI and the NESCIL/CFRD's own witnesses. Having regard for all of the foregoing the Board denies the NESCIL's motion to compel Mr. Mike Boyd, Mr. Richard Chabaylo and Mr. Keith Purves to attend and be cross-examined at the upcoming proceeding.

Yours truly,

<Original Signed by JP Mousseau>

JP Mousseau

cc. Interested Parties

APPENDIX 6 BOARD DECISION, JUNE 23, 2008, NOTICE OF CONSTITUTIONAL QUESTION, MÉTIS NATION OF ALBERTA

The Board has considered this morning its jurisdiction to hear matters relating to a Notice of Constitutional Question filed by the Métis Nation of Alberta, which I'll refer to as (the)"MNA," on June 13th, 2008.

In short, the MNA asserted that it has Aboriginal rights derived from Section 35 of the Constitution Act which give rise to a duty for the Crown to consult with it regarding the potential effects of the project. The MNA asserted that it issued the Notice out of an abundance of caution, and because it does not intend to challenge the constitutional validity of any legislation, the notice provisions provided in the Administrative Procedures and Jurisdictional Act are discretionary and may be waived by the Board should it determine it to be in the public interest to do so. The MNA also stated that it was not asking the Board to make a determination with respect to its Aboriginal rights or whether the Crown owed the MNA a duty to consult. Rather, it stated that it wanted the Board to consider evidence regarding lack of consultation. It conceded in this regard that some of this evidence may involve the discussion of rights that are constitutionally derived. It also asserted that because it may have constitutional rights that may be directly and adversely affected, it should be granted full participation rights in this hearing pursuant to Section 26 of the Energy Resources Conservation Act. Finally, the MNA suggested that it may also raise constitutional concerns pursuant to Section 7 of the Canadian Charter of Rights and Freedoms on behalf of individual landowners that are MNA members that it represents.

Having considered the submissions of the MNA, Alberta Justice, and PCOSI, the Board finds that it disagrees with the MNA's contention that notice under the Administrative Procedures and Jurisdiction Act is not required because it does not intend to challenge the constitutional validity of the legislation. The Board notes in this regard that the term "question of constitutional law" is defined in Section 10(d) of the Act, as:

"Question of constitutional law" means:

- (i) any challenge, by virtue of the Constitution of Canada or the Alberta Bill of Rights, to the applicability or validity of an enactment of the Parliament of Canada or an enactment of the Legislature of Alberta, or
- (ii) a determination of any right under the Constitution of Canada or the Alberta Bill of Rights."

Despite assertions to the contrary, the MNA is requesting the Board to make a determination of a right under the Constitution of Canada in its request for standing based on Aboriginal rights. In the Board's view, this is a constitutional question pursuant to Section 10(d). And, thus, notice in the form and manner prescribed by the Act is therefore required.

In that respect, Section 12(1) states as follows:

12(1) Except in circumstances where only the inclusion of evidence is sought under the Canadian Charter of Rights and Freedoms, a person who intends to raise a question of constitutional law at a proceeding before a designated decision maker that has jurisdiction to determine such a question

- (a) must provide written notice of the person's intention to do so at least 14 days before the date of the proceeding
 - (i) to the Attorney General of Canada,
 - (ii) to the Minister of Justice and Attorney General of Alberta, and
 - (iii) to the parties to the proceeding, and
- (b) must provide written notice of the person's intention to do so to the designated decision maker.

The Board finds that the language of 12(1)(a) provides no discretion to waive the notice requirement. The Board understands that this mandatory notice period was implemented to ensure that all affected parties, including the Crown in the Right of Alberta and Canada, have an adequate opportunity to respond to issues of this nature raised within the context of a hearing by a designated administrative tribunal. As the notice was not filed in accordance with the mandatory notice period, the Board finds that it has no jurisdiction to consider the questions of constitutional law raised in the MNA's application.

The Board notes that the MNA has also sought full participation rights pursuant to Section 26 of the Energy Resources Conservation Act based upon the rights of individual Métis landowners proximal to the project. First, the Board notes that the MNA has not stated which individuals are seeking standing in this regard, nor has it demonstrated that Maurice Law is authorized to speak on their behalf in this capacity.

The only information located by the Board with respect to potentially affected MNA landowners is found in Exhibit G-3, Appendix 10, which is an interview summary with five members of the MNA. While documents reflect that one interviewee subject lives within 6 kilometres of the proposed project, there is no information regarding the individual rights that this person may be asserting or how the project may directly and adversely affect those rights. More importantly, there is no information to suggest this person's desire to intervene in this proceeding.

The Board finds that it has insufficient information to make a determination with respect to the MNA's request for standing based on the information filed. Notwithstanding the Board's decision that the MNA has failed to demonstrate standing under Section 26, it is the Board's long-standing practice to allow parties without standing to participate in a limited fashion in a proceeding triggered by a party with standing. We had intended to call these parties. "discretionary participants." Noting that neither PCOSI nor the Alberta Crown objected to the participation of the MNA on the condition that it did not raise questions of constitutional law, the Board is prepared to allow the participation of the MNA as a discretionary participant in accordance with its long-standing practice.

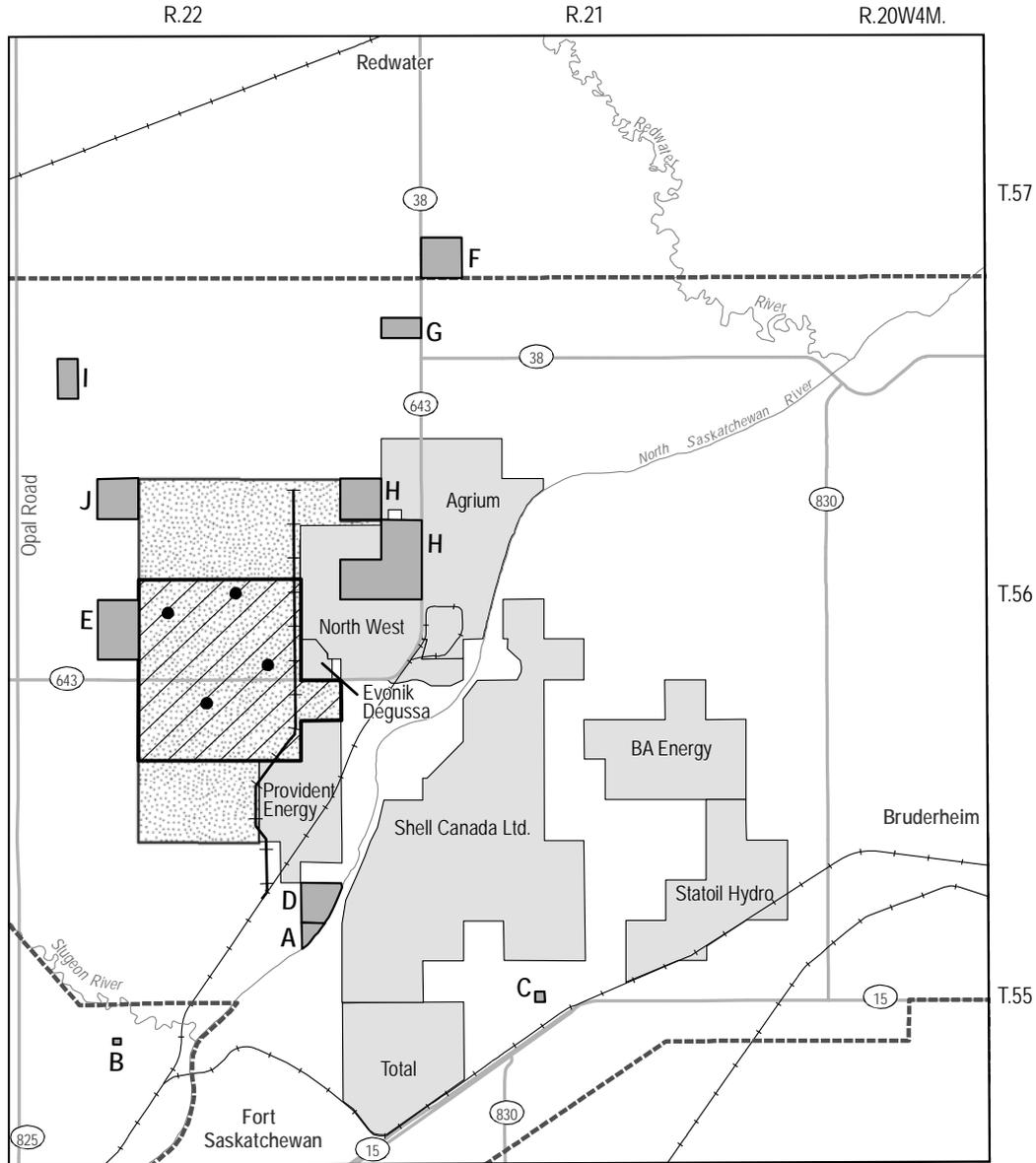
In this respect, the Board is willing to allow the MNA to make a short submission to the Board at some point following the evidence of PCOSI and the interveners with recognized standing. However, the Board cautions the MNA that it cannot consider any issues that made the definition of a question of constitutional law as defined in the Administrative Procedures (and Jurisdiction) Act. To be very specific, the Board cannot consider issues of the MNA's Aboriginal rights, including a right to meaningful consultation from the Crown. Likewise, the Board is similarly precluded from considering any issues related to individual MNA members relating to Section 7 of the Charter.

APPENDIX 7 RECOMMENDATIONS

This section is provided for the convenience of readers. In the event of any difference between the recommendations in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

- 1) The Board recommends to Sturgeon County that if it were to establish bylaws respecting work camps, the bylaws should give consideration to the Board's expectations of PCOSI regarding the provision of police and medical services and policies regarding drinking and driving, and smoking and driving. (Section 5.6.4)
- 2) The Board notes the evidence presented at the hearing regarding DIAL measurements that showed the potential for fugitive emissions to be underestimated at sour gas plants or refineries. The Board understands that the DIAL technology is a useful tool for quantifying fugitive emissions but notes that this tool has some limitations. Therefore, the Board will not condition its approval to require periodic DIAL surveys but expects that PCOSI will consider this technology when developing its LDAR program. The Board acknowledges the evidence that suggests that a gas leak imaging camera is a method recommended to aid in leak detection and that PCOSI expressed an interest in using this technology at the proposed upgrader. The Board recommends to AENV that it consider conditioning its approval to require PCOSI to use this technology as part of its LDAR program. (Section 7.1.5)
- 3) The Board notes that AENV is responsible for overseeing the activities of FAP and for ensuring that air monitoring is conducted in accordance with the Air Monitoring Directive (AMD). The Board notes that AENV conducted an audit of the FAP ambient air monitoring stations in May 2007 and that the audit identified a number of deficiencies in the air monitoring network and highlighted the need for additional work to ensure compliance with the AMD. The Board acknowledges the concerns that residents have expressed with respect to the audit findings and the follow-up by FAP and AENV to those findings. It is the Board's view that the timely repair of the problems identified in the audit is necessary to ensure the quality and credibility of the ambient air quality data. Therefore, the Board recommends that AENV confirm that the deficiencies raised in the May 2007 audit have been addressed and that AENV communicate with the community in a timely manner that the work has been completed. The Board further recommends that AENV conduct regular audits to ensure that the monitoring network is operating correctly and providing credible data. The Board expects that as part of its oversight of FAP, AENV will determine if it is warranted to have Dr. Blake or another independent expert calibrate the FAP monitors. (Section 7.2.5)
- 4) It is the Board's understanding that the monitoring done by FAP is performed for compliance and regional purposes. The Board further understands that there is a process for determining what emissions to monitor and how to monitor those emissions and monitor locations. The Board appreciates that this process takes into account many factors and accepts that AENV and FAP have sufficient justification for their conclusions on these matters. The Board recommends to AENV and FAP that they jointly publish a document that explains the scope, purpose, and intent of the monitoring programming in a manner that is easily understandable by the general public. In addition, the Board recommends to AENV that it consider making the data available by means other than the Internet. (Section 7.2.5)

- 5) The Board notes that there have been measured exceedances of the AAAQO at some of the FAP monitoring stations. The Board believes that measured exceedances are a cause for concern if they are frequent, if they exceed the objective in a substantial way, or if they are ignored and not investigated by the proper authorities. However, the Board was not presented with evidence that any of the above situations have been or are likely to be experienced. To the contrary, the evidence shows that recorded exceedances are very infrequent, exceed the objective by only a small margin, and are appropriately analyzed by the authorities. Notwithstanding, the Board recommends to AENV that it consider advising the public about the procedures that are in place to identify and follow up if an exceedance is measured at one of the FAP monitoring stations. (Section 7.2.5)
- 6) The Board is aware of further industrial development planned for this area. The Board heard evidence regarding the effects of SO₂ and NO_x emissions on ecosystems. Notwithstanding the regional emission caps proposed for the area, the Board strongly recommends to AENV that a terrestrial monitoring program be implemented for the area to ensure that ecosystem health can be better quantified and that problems can be identified early. (Section 7.2.5)
- 7) The Board recognizes that light pollution is an emerging issue in the AIH. The Board believes that similar to noise concerns, it would be appropriate for an area-wide assessment to be done of the impacts of light pollution on surrounding neighbours. The Board recognizes that it does not have jurisdiction over all of the entities involved with NCIA. However, the Board believes that there is an opportunity for NCIA to become involved in this issue and recommends to NCIA that it consider the regional light issue and perform an area-wide assessment. Depending on the results of the assessment, it may be necessary to take appropriate measures through the design and operation of facilities to minimize these impacts. (Section 14.4)



Legend

- | | | |
|------------------------------|--------------------------------|--------------------------------|
| River | Possible camp location | Landowner/intervener residence |
| Other railroad | Proposed CN railroad | A - Ainley |
| Road | Proposed Petro-Canada upgrader | B - Brown |
| Alberta Industrial Heartland | Principal development area | C - Chichak |
| | Other industry | D - Craggs |
| | | E - Groot |
| | | F - Kiriak |
| | | G - Meijer |
| | | H - Smulski |
| | | I - Hoehn |
| | | J - Shaw |

*Interveners not shown on map:
 Murray (NE.23.53.22.W4)
 Collier (NW.8.56.23.W4)

Figure 1. Project map