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November 19, 2012

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Our Matter Number: 1086017

**Sent By Electronic Mail**

Jackpine Mine Expansion Panel Secretariat  
Canadian Environmental Assessment Agency  
160 Elgin Street  
Ottawa, ON K1A 0H3

Attention: Mr. Jim Dilay - Joint Review Panel Chairman

**Jackpine Mine Expansion Project (the "Project")  
CEAR Reference Number 10-05-59540  
Rebuttal Evidence**

On November 15, 2012, the Secretariat issued written questions to Dr. Schindler and to the witnesses of the Athabasca Chipewyan First Nation ("ACFN"). On Friday, November 16, the Joint Review Panel determined that Shell will have a right to provide rebuttal evidence in writing, if necessary. The attached tables constitute Shell's rebuttal evidence.

Yours truly,

<signature removed>

Shawn H. T. Denstedt, Q.C.

SD:sln

Attachments

c: G. Perkins, Energy Resources Conservation Board  
J. Biem/E. Murphy, Woodward & Company Lawyers LLP (ACFN)  
D. Bishop, K2B Law, Klimek Buss Bishop (Metis Nation of Alberta)  
K. Lambrecht, Q.C., Department of Justice Canada  
J. Elford, Department of Justice Canada  
K. Buss, K2B Law, Klimek Buss Bishop (OSEC/Fort McKay)  
M. Gorrie, OSEC  
G. Rangi Jeerakathil, MacPherson Leslie & Tyerman LLP (Fort McMurray First Nation)  
D. Mallon, Prowse Chowne LLP (MCFN)  
D. O'Callaghan, Prowse Chowne LLP (MCFN)  
R. Purdy, Q.C., Brownlee LLP (RMWB)  
B. Roth, Fraser Milner Casgrain LLP (Syncrude)  
S. Ladha, Fraser Milner Casgrain LLP (Syncrude)  
A. Johnston, In Law and Equity (Non-status Fort McMurray/Fort McKay First Nation & Clearwater)  
K. Stewart  
D. Deranger  
A. Zalik/I. Osuoka  
K. Johnston, TOTAL E&P Canada Ltd.  
T. Rothwell, Province of Alberta  
D. Kolenick, Shell Canada Energy  
D. Crowe, Shell Canada Energy

**SHELL REBUTTAL TO DR. SCHINDLER’S WRITTEN RESPONSES**

<b>Schindler Page Reference No.</b>	<b>Shell Rebuttal</b>
4	<p>Dr. Schindler states that some compounds are carcinogenic, mutagenic and teratogenic effects on fish. Mixtures of contaminants can have antagonistic effects (in other words, their combined toxicity is reduced), synergistic effects (in other words, their combined toxicity is enhanced), or additive effects (in other words, their combined toxicity is additive). Where mechanisms of effect are known, these are taken into account when developing toxicological benchmarks (which Dr. Schindler refers to as “targets for individual contaminants”). For instance, the chronic effect benchmarks (CEBs) developed for polyaromatic hydrocarbons (PAH) for this Project were based on the known additivity of these contaminants, thus mixture effects were considered in addition to the effects of individual PAH. Where mechanisms are not known, a reasonable level of conservatism is implemented and is considered protective. In Canada the Canadian Council of Ministers of the Environment (CCME) and in the US the United States Environmental Protection Agency (USEPA) set guidelines and criteria, respectively, for single chemicals, not for mixtures.</p> <p>Although benchmarks have not been set for alkylated PAHs and dibenzothiophenes, co-occurrence with other contaminants of potential concern for which benchmarks are available is expected. In particular, co-occurrence is expected with other PAH and, as noted above, CEBs have been set for a range of other PAH and for PAH mixtures.</p>
7	<p>It is clear from Dr. Schindler’s responses to Questions 1 and 2 that he has not reviewed the Aquatic Health Assessment completed for the EIA. If he had, he would find that chronic effects benchmarks were derived for most assessed water parameters. For the specific examples given, results of toxicological tests on 14 aquatic species were considered for chromium and on 13 species for strontium. Some of these tests were specifically conducted during the sensitive larval stages. Similar endpoints were evaluated for other metals and PAHs, as documented in May 2012 Submission, Appendix 3.6, Section 2.</p>
8	<p>Dr. Schindler discusses potential effects of loss of wetlands and saline seepages. The reclaimed landscape will be designed to direct saline seepages to the pit lake prior to release, not towards surface watercourses. The groundwater baseflow to the Muskeg River comes from both wetland and upland areas and their contribution prior to development, during operations and post-closure were assessed in the EIA and the results considered in the hydrology, water quality, aquatic</p>

<b>Schindler Page Reference No.</b>	<b>Shell Rebuttal</b>
	health and fish and fish habitat assessments. These found the residual impacts of the reduction in groundwater baseflow to be negligible to low.
9	Shell's application does not include end pit lakes as part of their fish habitat compensation plan. Shell believes with the removal of mature fine tailings that future pit lakes can be designed to perform as well as constructed compensation lakes (e.g., Jackpine Mine Phase 1 Compensation Lake) and that water quality concerns associated with drainage from the closure landscape can be managed. However, Shell is not relying on end pit lakes to achieve compensation and the NNLP proposed by Shell does not consider any credits for future fish habitat created within the future pit lakes or closure landscape that could provide for compensation ratios much greater than 2:1 (Exhibit 001-064B).
10	<p>Dr. Schindler's response highlights his lack of familiarity with the work conducted in the lower Athabasca River region over the last several decades, the biology of fishes within the watershed and the work completed to date to support the Phase 2 Framework.</p> <ul style="list-style-type: none"><li>• Contrary to Dr. Schindler's claim, key habitats for many species within the Athabasca River are known, such as the migratory pattern and location of primary spawning habitat for lake whitefish in the Athabasca River upstream of Fort McMurray. This critical habitat area is located upstream of oil sands operations and has been known since the AOSERP studies in the 1970s and subsequently confirmed on numerous occasions through field programs conducted on behalf of RAMP and CEMA.</li><li>• In development of the Phase 2 Framework recommendation (which included Aboriginal participation and input), 7 impact hypothesis were evaluated in detail from an initial list of 29 hypotheses to evaluate potential changes to different aspects of the aquatic ecosystem and biota caused due to water withdrawals (Exhibit 017-016M).</li><li>• The final recommendation by the Phase 2 Framework committee, which set restrictions on industry withdrawal below 87 m<sup>3</sup>/s and would not be affected by the JPME project, found little sensitivity for most impact hypothesis with the withdrawal restrictions in place. Where data gaps and uncertainty existed, additional data collection and analysis are currently being</li></ul>

<b>Schindler Page Reference No.</b>	<b>Shell Rebuttal</b>
	conducted.  It is clear from Dr. Schindler's comments about only using "wetted area" that he did not review the work completed by the Phase 2 Framework committee and does not have the specific knowledge to provide a response to this question.

**SHELL REBUTTAL TO THE WRITTEN RESPONSES BY THE ACFN**

<b>Topic</b>	<b>Shell Rebuttal</b>
Reclamation	<p>Dr. Gutsell states that she is not an expert in wetland ecology, and her remarks suggesting that cattail dominated marsh-like sites are all that are possible for wetland reclamation are simply unfounded. There is considerable research underway or recently published that is demonstrating that wetland species other than cattails grow in reclaimed wetland sites. Dr. Gutsell references one such paper in her response to 3b), Vitt et al, in which a transplanted sedge species was able to establish. The reclamation requirement in Alberta is not to create a landscape that is identical to the pre-disturbed state in terms of species diversity and composition, as Dr. Gutsell seems to suggest. The goal is to re-establish a functional landscape that provides equivalent land capability. It is not disputed that species diversity and composition is likely to be lower in the reclaimed landscape compared to an undisturbed natural landscape, at least within the timescales of reclamation under the current regulatory framework used to develop the closure plan. Shell’s position regarding the goals for successful reclamation are consistent with the CEMA revegetation guidelines, which is a live document that is expected to be updated as new effective reclamation techniques emerge. Shell has committed to adaptive management regarding reclamation planning, and Shell expects to adapt its reclamation strategy and goals as the guidelines continue to evolve.</p>
Source Wildlife Populations	<p>In her response to question 4b, Dr. Gutsell states “The problem we increasingly face in the Oil Sands region is that large regions are being disturbed and large tracts of effective habitat are continually being removed, thus impacting potential source populations on the landscape.” However, her statement has no basis in fact. First, Dr. Komers’ analysis of disturbance exaggerated the extent of disturbance in the region by assuming that all land within 250 m of any disturbance including seismic lines was not available (Exhibit 006-013O, Adobe 12). As demonstrated by his own testimony at the hearing (Transcript Vol. 11, pgs. 2618-2619), this is simply not the case. Second, using data from Shell’s cumulative effects assessment submitted to the Joint Review Panel in September 2012, 87% of the regional study area is not disturbed in the 2012 Planned Development Case. Potential source populations within the regional study area are and will be available in the future (Exhibit No. 001-057 Adobe 36).</p>
Woodland Caribou	<p>Dr. Candler discusses additional sightings of caribou in the JME local study area as proof that Shell has underestimated the effects of the Project on caribou. However, given the relatively small number of sightings that he refers to in his response, Shell stands by the assertion</p>

<b>Topic</b>	<b>Shell Rebuttal</b>
	<p>that caribou do not use the area on a regular basis and that the Project will have a negligible indirect effect on the species.</p> <p>As stated in the EIA, over one year of ungulate aerial surveys and two years of winter track transect surveys, no caribou were observed and only one caribou track was found (Exhibit No. 001-001L). Wildlife biologists were on the local study area were many other wildlife surveys in all seasons and caribou were not seen incidentally. In addition, based on aerial surveys and telemetry collar data, the Government of Alberta has defined boundaries for the ranges of herds in the province and the local study area does not fall within any caribou ranges. Shell does not dispute that caribou may occasionally make use of the LSA. However, baseline data collected for the Project, as well as data collected on behalf of the Government of Alberta reinforces the conclusion that woodland caribou are virtually absent from the LSA.</p>
Wood Bison:	<ul style="list-style-type: none"><li>• Wood bison are obligate grazers (Exhibit 001-015C), subsisting on grasses and sedges and so tend to be strongly associated with graminoid dominated plant communities (Lartner and Gates 1991, Jensen 2005). Wood bison display substantial seasonal variation in diet, and focus on sedges during winter (Lartner and Gates 1991). Sufficient forage resources for wood bison are available in fewer habitats during winter (Lartner and Gates 1991, Redburn et al. 2008), indicating that winter is the limiting season for bison. For this reason, the effects to high suitability winter habitat as a result of changes in the RSA were quantified in the May 2012 submission (Exhibit No. 001-051N).</li><li>• The area planned for the No Net Loss Lake is likely used by bison in winter but it is by no means a rare habitat type and extensive winter range exists within the range of the Ronald Lake herd, contrary to Dr. Candler's arguments.</li><li>• It is commonly known that bison travel outside the park (Mitchell and Gates 2002), and as such are available for harvest by First Nations and others.</li></ul> <p style="text-align: center;">Mitchell, J.A. and C.C. Gates. 2002. Status of the wood bison (<i>Bison bison athabasca</i>) in Alberta. Alberta Sustainable Resource Development, Fish and Wildlife Division, and Alberta Conservation Association, Wildlife Status Report No. 38, Edmonton, AB. 32 pp.</p> <ul style="list-style-type: none"><li>• Although hunters from MacMurray are known to hunt bison from the Ronald Lake herd, to suggest that a slaughter will take place as a result of this project, as suggested by Dr. Candler, is</li></ul>

<b>Topic</b>	<b>Shell Rebuttal</b>
	unwarranted.
Moose	<ul style="list-style-type: none"><li>• Although Golder is aware of additional data that Dr. Komers has cited (e.g., Suncor moose data), most data that we are aware of are not reliable for addressing trends in the region because they are done over small areas and are not necessarily applicable for regional trend analysis.</li><li>• Shell acknowledges that moose populations in the RSA are likely to be declining (#001-083). Although declines in moose abundance may have occurred in association with development, abundant quality habitat is currently available, and will continue to remain in the RSA in the 2012 PDC. Habitat predicted to be of high and moderate-high suitability combined make up 41% (938,318 ha) of the RSA in the Pre-Industrial Case, about 36% of the RSA in the 2012 Base Case and 2012 Application Case, and 33% (752,185 ha) of the RSA in the 2012 PDC (#001-083). Moose are also capable of responding to improved habitat conditions by increasing their reproductive potential (Loranger et al. 1991). Recent large burns such as the Richardson Fire in 2011 will likely increase moose habitat quality in the next 10 to 15 years in the RSA.</li></ul> <p>Loranger, A.J., T.N. Bailey and W.W. Larned. 1991. Effects of forest successions after fire in moose wintering habitats on the Kenai Peninsula. <i>Alces</i> 27: 100-110.</p>