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FMFN Technical Review Meeting Jackpine Mine Expansion & Pierre River Mine Projects

March 23 – 24, 2010

Introduction

- Welcome
- Safety Briefing
- Housekeeping Items
- Introductions
  - Name and role
  - Area of specialization

Meeting Purpose & Approach

- Purpose
  - Part of continuing consultation on JPME and PRM
  - Provides a first level response to the issues raised in the FMFN Technical Review
  - To engage in dialogue and identify where further discussions will be required

Meeting Purpose & Approach

- Agenda (handout)
- Organized by headings in FMFN Technical Review (themes)
    - Shell will present high level overview of each theme – no intent to have substantive discussion on these presentations
    - FMFN will lead Shell through questions in its Technical Review and Shell will provide its responses
- Time per theme limited given the number of questions
- Facilitators will keep us on track with time management

Meeting Purpose & Approach

- Respect for different perspectives
- May need to take away questions and come back for more discussion
- May agree to move questions to be answered in the discussion of another theme and will keep track of these
- May agree to skip questions if we agree they have already been answered
- May agree to disagree or move a question aside if we agree are unlikely to reach agreement within time constraints
- May schedule subsequent meetings if we agree they are required
- Shell will provide a written response at a later date, when Technical review discussions are complete

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Noise

Bill Kovach – EIA Coordinator, Shell Canada Energy

Wayne Speller – EIA Project Director, Golder Associates Ltd.

Fort McKay's Technical Review of Noise

Key Fort McKay Concerns:

- Development of Permissible Sound Levels (PSLs) used in the assessment
- Shell commit to conducting noise surveys in Fort McKay and three cabins during project construction and operation
- Shell provide additional details on noise mitigation plans for Pierre River Mine

Shell's Response

- The baseline program monitored noise levels at the cabins ranging from 25 dBA to 40 dBA with the median being approximately 38 dBA. This is comparable to the ERCB rural night-time ambient of 35 dBA and Shell believes no adjustment was required.
- Compliance at the 1.5 km boundary indicates that noise contributions from Shell operations at the receptors outside that boundary will be compliant.
- Shell will review the noise management plan with Fort McKay, as outlined in Section 5.1 of Directive 038. The noise management plan will consider:
  - Identification of noise sources;
  - Assessment of current mitigation plans/programs;
  - Performance effectiveness of noise control devices;
  - Methods of noise measurement;
  - Best practises programs; and
  - Continuous improvement programs (Directive 038, Section 5.1).

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Air Quality

Bill Kovach – EIA Coordinator, Shell Canada Energy

Candace Bell – Air Quality Meteorologist, Golder Associates Ltd.

Greg Unrau – Senior Meteorologist, Golder Associates Ltd.

Fort McKay's Technical Review of Air Quality

Key Fort McKay Concerns:

- Fort McKay's suggests their air quality criteria be adopted and considered in future oil sands project EIAs for the assessment of air quality impacts on the Community of Fort McKay
- Fort McKay recommends that a regional odour management strategy be developed prior to the approval of any more projects
- It is recommended that air quality criteria for assessing vegetation impacts in Fort McKay's Traditional Lands in the RMWB region be established and standardized, in consultation with Fort McKay
- Fort McKay recommends that the regulators require, and Shell commit to, more stringent NO_X emission control measures to minimize project emissions that would contribute to nitrogen deposition in the region

Shell's Response

- Shell is an active participant in regional air quality management initiatives:
  - AENV Regional Sustainable Development Strategy.
  - Cumulative Environmental Management Association (CEMA).
  - Wood Buffalo Environmental Association (WBEA).
- Shell will meet requirements of the Acidification Management Framework and the Trace Metals Management Framework, both of CEMA, as well as the Clean Air Strategic Alliance's (CASA) $PM_{2.5}$ management framework
- Shell has proposed a number of management systems and mitigation measures as part of the project to reduce air emissions
- Shell has programs in place to respond to external odour complaints

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Water Quality and Aquatic Health

Bill Kovach – EIA Coordinator, Shell Canada Energy

Jerry Vandenberg – Water Quality Specialist, Golder Associates Ltd.

Jody Berry – Environmental Risk Assessor, Golder Associates Ltd.

Fort McKay Technical Review of Water Quality and Aquatic Health

Key Fort McKay Concerns:

- Rather than using SSD-derived benchmarks that have not been critically reviewed, use CCME or AENV guidelines where they exist and/or consider utilizing aquatic TRVs that are used by USEPA for ecological risk assessments
- Describe how Kearl Lake's particulate deposition will be augmented with increased flows
- Describe how the Kearl Lake berm may be adjusted to expose more natural shoreline and permit traditional uses to continue.
- The acceptance and reliance on end pit lakes for treatment of MFT and process affected waters be stopped until such time as this method of treatment is proven to be viable in a scientifically defensible (peer reviewed) manner.

Shell's Response

- Surface water quality guidelines (e.g., AENV, CCME, USEPA) were included in the first level of screening to identify substances of potential concern (SOPCs)
- The SSD approach has been critically reviewed and adopted by Canadian Council of Ministers of the Environment (CCME) for deriving guidelines.
- The higher flows into Kearl Lake due to operational diversions are comprised of runoff from undisturbed areas. At closure, the upstream pit lake is likely to reduce, rather than increase sediment loading to Kearl Lake.
- Adjustments to Kearl Lake levee placement may be possible to improve protection of traditional use areas
- Peer-reviewed research indicates that pit lakes will develop into viable ecosystems capable of supporting aquatic life and Shell supports continuing research into pit lake design and performance

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Fisheries

Bill Kovach – EIA Coordinator,
Shell Canada Energy

Rick Courtney – Environmental Specialist,
Shell Canada Energy

Kasey Clipperton, Golder Associates Ltd.

Fort McKay Technical Review of Fisheries

- Concerns about Muskeg River, Muskeg Creek and Kearl Lake
  - In the JPM Phase 1 Application, Muskeg Creek was completely realigned and the HADD for the impact was assigned to JPM Phase 1 and habitat compensation was required.
  - In the new application, Muskeg Creek on Ft. McKay land is left in place to support the high quality habitat on the Ft. McKay land and to support the Compensation Lake just downstream of Ft. McKay land.
  - Natural levels of fish passage to Kearl Lake will be maintained. Studies to evaluate fish natural passage in Muskeg Creek began in 2009.
  - Shell has proposed mining upper reaches of Muskeg River for decision at the Joint Panel.
- Concerns about suitability of fish for consumption
  - There are extensive monitoring programs in place by RAMP, AENV and Shell.
  - Shell is proposing methyl mercury monitoring in all of its compensation lakes.

Fort McKay Technical Review of Fisheries

- Concerns about lost fishing opportunities
  - Compensation habitat will provide better fishing opportunities than the habitat it replaces.
  - Compensation habitat provided will produce more fish suitable for fishing than the habitat it replaces. The delay in compensation is considered by DFO and additional permanent compensation is required to make up for the temporary delay.
  - Fish habitat, including small streams will be created on the reclaimed landscape as well, but Shell receives no credit for that habitat.
- Want involvement in monitoring, planning, approvals
  - Are routinely involved in Shell's No Net Loss Plan, Monitoring Plan
  - Approvals are the responsibility of the Regulators

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Surface Water

Bill Kovach – EIA Coordinator, Shell Canada Energy

Femi Ade – Senior Water Resources Engineer, Golder Associates Ltd.

Fort McKay Technical Review of Surface Water

Key Fort McKay Concerns:

- Shell should provide an annual breakdown of their existing Athabasca River Water Act license per mine site and comment on the adequacy of their proposed water storage capacities
- Shell should comment on why they cannot maintain the Muskeg River channel in its natural state rather than piping the water through a pipeline and mining through the river
- Given the slowdown in the oil sands development, Shell should comment on the representativeness of their Application Case flow predictions for the Muskeg River

Shell's Response

- Shell has assessed its water needs based on anticipated water balances
- Shell will comply with the Phase 2 Athabasca River Water Management Framework
- Shell believes its plans to divert the Muskeg River balance resource extraction and environmental/social considerations.
- Since the completion of the EIA, there has been no new available data and information on the oil sands developments in the Muskeg River watershed that would substantially change the Application Case flow predictions for the Muskeg River

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Groundwater

Bill Kovach – EIA Coordinator, Shell Canada Energy

João Küpper – Water Resources Principal Hydrogeologist, WorleyParsons Canada

Fort McKay Technical Review of Groundwater

Key Fort McKay Concerns:

- Offsets be developed to mitigate the loss of existing and potential future groundwater-sources and ground-water resource dependant traditional activities (e.g. loss of fens), in consultation with Fort McKay
- Loss of traditionally-used plants and groundwater sources that may be in the areas adjacent to the Project and potential mitigative measures to protect the groundwater sources and the growing environments
- Development of groundwater monitoring programs and reporting of monitoring results and incidents
- Verification of groundwater modelling predictions through groundwater monitoring

Shell's Response

- Shell has focussed its mitigation to address potential impacts on receptors
- Drawdown mitigation is not planned, as groundwater levels are temporary and expected to recover following dewatering activities
- Shell will develop groundwater monitoring programs
- Groundwater monitoring will provide input into groundwater model validation

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Human Health Risk

Bill Kovach – EIA Coordinator, Shell Canada Energy

Bart Koppe – Senior Risk Assessor, Intrinsik

Fort McKay Technical Review of Human Health

Key Fort McKay Concerns:

- Shell should justify how the widespread use of surrogates and chemical groupings supports conservatism in their HHRA
- Shell should present clear justification for not including potential synergism in their JME and PRM HHRA
- We recommend that Shell revise the concluding HHRA summary statement to recognize that emissions from JME and PRM are expected to lead to increased risk human health
- We recommend that Shell explore with Fort McKay what programs could be supported or devised to promote health so as to offset potential negative health impacts of the JME and PRM, including support for Fort McKay's Community Health Strategy

Shell's Response

- The study team chose to assess those chemicals for which little to no toxicity data are available by placing them in chemical groups and applying a "chemical surrogate" or "chemical analogue" approach, consistent with guidance on chemical grouping
- Additivity is the most plausible chemical interaction and chemical interactions were assumed to be additive in nature as per Health Canada's guidance
- The study team stands by its conclusions of the HHRA, but does acknowledge that the project emissions will increase health risks in the region. However, this increase in health risks is not expected to result in measurable health effects in the area residents
- Community health programs would be topic for benefits agreement discussions

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Mine Plan and Closure, Conservation and Reclamation Plan

Vivienne Wilson – Reclamation Coordinator,
Shell Upstream Americas

Fort McKay Technical Review of the Mine Plan and CC&R Plan

Key Fort McKay Concerns:

- Shell should look at ways of creating more gently sloping topography and the hydrological conditions suited to peatland formation in order to achieve equivalent capability on the final reclaimed landscape
- Fort McKay requests that Shell increase the pace of reclamation on all their mines, and would like to discuss alternative tailings management strategies which will conform to ERCB Directive 074
- Fort McKay opposes the deposition of tailings into end pit lakes as a method of long-term tailings storage
- Fort McKay asks that Shell undertake field-scale trials to establish peat-accumulating wetlands and re-establishing other plant species of importance to traditional use including rat root

Fort McKay Technical Review of the Mine Plan and CC&R Plan

Key Fort McKay Concerns:

- Shell should continue to work with Fort McKay during the development and implementation of reclamation programs in support of traditional use
- Fort McKay should ask Shell to ensure that it maximizes the direct placement of soils, and diversifies the landscape to ensure that a wide variety of ecosites will be established
- Fort McKay may wish to see a progressive and proposed schedule of when Shell intends to apply for certification, and have the opportunity to comment on any future applications for certification

Shell's Response

- Shell has proposed areas of gently sloping topography (0 to 2%) on the closure landscape, which have the potential to create the hydrological conditions suited to peatland formation. Opportunities to to change topography and hydrology are assessed throughout the life of the mine.
- Shell supports early and progressive reclamation. Alternative tailings options that support early reclamation are discussed within Directive 074 plans for 2009 submitted to ERCB, and are available for public review
- Shell is investigating ways of reducing mature fine tailings volumes, which could potentially reduce pit lake storage requirements
- Shell is investigating ways to create landforms necessary to establish peat-accumulating wetlands types. Suncor is conducting rat root transplantation trials this year – Shell will track progress and transfer the research knowledge to reclamation activities

Shell's Response

- Shell looks forward to the work of the joint reclamation committee with Ft McKay, and the guidance that will be provided for supporting traditional use of reclamation areas
- Shell understands the concerns around direct placement of soils and landscape diversification of ecosite types in the reclamation landscape. Environmental reporting consultations have started to discuss the details of soil placement and ecosite distribution
- Shell's understanding is that stakeholders are already part of the certification application review process.

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Soils and Terrain

Vivienne Wilson – Reclamation Coordinator,
Shell Upstream Americas

Fort McKay Technical Review of Soils and Terrain

Key Fort McKay Concerns:

- Fort McKay may wish to consider requesting Shell to commit to research towards the reclamation of organic soils and the establishment of peat-accumulating wetlands
- There is additional potential that the permanent loss of soils to pit lakes can be minimized by alternative strategies in tailings management. Fort McKay requests to review Shell's revised tailings strategies which will undoubtedly be required as a result of the ERCB Tailings Directive 074
- Fort McKay recommends that Shell increase the pace of reclamation on all of their mines, in order to realize opportunities for direct placement of surface soil materials

Shell's Response

- Shell currently participates in regional research underway on establishment of peat-accumulating wetlands. Organic/peat soils are already reclaimed as part of soil salvage activities, including direct placement of peat materials where possible (e.g. Jackpine Compensation Lake)
- Shells tailings management an dedicated disposal area plans for 2009 have been submitted to the ERCB, and are publicly available for review on the ERCB website
- A commitment to optimizing the pace of reclamation is stated in EIA. Opportunities to complete early/progressive reclamation are assessed throughout planning activities for the life of the mine

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Terrestrial Vegetation, Wetlands and Forest Resources

Vivienne Wilson – Reclamation Coordinator,
Shell Upstream Americas

Ryan Ancelin – Terrestrial Ecologist, Golder
Associates Ltd.

Fort McKay Technical Review of Vegetation

Key Fort McKay Concerns:

- Fort McKay may wish to request that Shell continue its involvement with CEMA's Reclamation Working Group (Wetlands and Aquatics Subgroup), develop on-site plans for experimental peatland reclamation and dedicate land to a long-term wetland research project
- Fort McKay may wish to ask Shell to develop reclamation practices that utilize a broad range of traditional use plants and reintroduce rare species in their reclamation programs
- Fort McKay may wish to request that Shell develop measures to monitor and mitigate the potential effects of surface water disturbance on off-site wetlands
- Fort McKay may want to ask the regulators to develop meaningful criteria to assess disturbance of ecosystems and landscapes and establish thresholds for disturbance

Shell's Response

- Shell anticipates supporting the development of wetlands reclamation technology through research, progressive reclamation and ongoing participation in committee work informing wetlands reclamation practices
- Shell plans to provide the conditions to support traditional use and rare plant species within reclamation areas. Further guidance on how to achieve this is anticipated through the joint Shell/Fort McKay reclamation committee.
- A wetlands monitoring program has been underway since 2000 at the Muskeg River Mine – conceptual plans presented in the EIA for wetlands drawdown monitoring will build on this. Monitoring for drawdown not anticipated by the EIA is expected to be part of a potential EPEA approval.
- Shell is engaged in CEMA committees, and LUF/LARP consultation guiding the development criteria for assessing the disturbance of ecosystems and landscapes.

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Wildlife Health Risk

Bill Kovach – EIA Coordinator, Shell Canada Energy

Bart Koppe – Senior Risk Assessor, Intrinsik

Fort McKay Technical Review of Wildlife Health Risk

Key Fort McKay Concerns:

- Chemicals of concern to wildlife are accumulating in the environment. The impacts of these chemicals to wildlife and wildlife users need to be studied and understood on a regional scale
- Fort McKay is concerned that Shell's health model are not detecting potential health impacts to wildlife and requests that Wildlife Health Assessment results are verified

Shell's Response

- The environmental risk assessment evaluated the potential impacts of chemical emissions on both wildlife and wildlife users on a regional scale, including a comprehensive sampling program
- Over time, the findings of the Wildlife Health Risk Assessment will be verified through monitoring at Shell's development areas and through Shell's continued participation in the Terrestrial Environmental Effects Monitoring (TEEM) program.
- In addition, Shell will continue to participate in RAMP in order to monitor water quality in receiving watercourses and waterbodies.

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Wildlife

Bill Kovach – EIA Coordinator, Shell Canada Energy

Martin Jalkotzy – Senior Wildlife Ecologist, Golder Associates Ltd.

MCFN Technical Review of Wildlife

Key MCFN Concerns:

- The collection of 68 dead birds is not a measure of impact and the manufacturer's bird deterrent performance claims are inappropriate for an EIA. Therefore, Fort McKay believes that the conclusion of low magnitude impact is invalid. Until shown otherwise, a local negative impact should be assumed
- Shell has not provided enough data to make conclusions about removal of nuisance black bears, vehicle-wildlife collisions impacts and sensory disturbances on wildlife populations
- Does Shell plan on preserving high quality moose habitat adjacent to their mine projects by acquiring and setting aside land with high quality moose habitat?
- Shell should agree to maintain the Muskeg River corridor through the Jackpine Mine Expansion area until the wildlife corridor research program is complete and then use the results to develop a mine plan

Shell's Response

- Shell does acknowledge a local negative impact of low magnitude and has two staff conducting monitoring seven days a week during the open water season. They are collecting mortality data
- Shell believes the current assessment adequately describes the effects of the Project on the noted species
- Shell does not plan on preserving high quality moose habitat adjacent to their mine projects by acquiring and setting aside land with high quality moose habitat
- A corridor along the full length of the Muskeg River is not required to maintain wildlife connectivity in the regional landscape; the current plan has the northeast end of Muskeg River corridor opening onto the Fort Hills. The Fort Hills are contiguous with lands in the far eastern portion of the RSA