

**FINAL TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT**

FOR THE

SUNCOR ENERGY INC.

VOYAGEUR SOUTH PROJECT

Approximately 15 km North of Fort McMurray, Alberta

ISSUED BY: ALBERTA ENVIRONMENT

DATE: July 19, 2007

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1.0 INTRODUCTION

1.1 Background

The Voyageur South Project (the Project) proposes to develop an expanded mining operation to be integrated into the company's existing oil sands operation near Fort McMurray, Alberta. The Project targets production of 120,000 barrels per day bbl/d bitumen feedstock for Suncor's upgrading operations. The Voyageur South Project area is located on the west side of the Athabasca River near the existing Suncor facility. The oil sands will be extracted using a new, mobile ore-preparation technology. Extraction will employ modified Clark hot water processes similar to those currently used at Suncor.

The purpose of these Terms of Reference is to identify for Suncor Energy Inc. (Suncor) and stakeholders, the information required by government agencies for an Environmental Impact Assessment (EIA) report.

1.2 Scope of the Environmental Impact Assessment (EIA) Report

Suncor will prepare and submit an EIA report that examines the environmental and socio-economic effects of the construction, operation and reclamation of the Project. The Study area for the EIA report will include the Project Area and associated infrastructure, as well as the spatial and temporal limits of individual environmental components outside the Project Area boundaries where an effect can be reasonably expected.

The EIA report shall be prepared in accordance with these Terms of Reference and the requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and associated regulations and the *Canadian Environmental Assessment Act*, if it applies to the Project. It will form part of Suncor's application to the Alberta Energy and Utilities Board (EUB).

The EIA report will include issues raised during the public consultation process, a glossary of terms and a list of abbreviations to assist the reader in understanding the material presented. It will also include tables that cross-reference the report (subsections) to the EIA Terms of Reference and to any current applications submitted pursuant to the EPEA and Water Act and appropriate federal statutes. It will also identify the environmental and other specific regulatory approvals, policy directives and legislation that are applicable to the Project at the municipal, provincial and federal government levels.

The EIA will also include a stand-alone summary report that will provide readers with a clear understanding of the project and its potential effects. It will include the environmental, cultural, socio-economic and health impacts that are anticipated, including cumulative considerations and proposed protection plan(s), mitigation measures and monitoring and residual effects. Suitable maps, charts and other illustrations will be included to identify the components of the Project, the existing conditions, and the environmental and the socio-economic implications of the development.

2.0 PROJECT DESCRIPTION

2.1 The Proponent and Lease History

Provide:

- a) the name of the proponent;
- b) the name and legal entity that will develop, manage and operate the Project;
- c) a corporate profile clearly outlining the ownership structure of the corporation;
- d) a brief history of Suncor's operations, including existing facilities;

- e) an overview of the recent EIAs and the associated developments completed by Suncor in the Voyageur South Project area; and
- f) an outline of Suncor's overall plans for all oilsands development in the region.

2.2 Project Development

Provide a schedule outlining the proposed phasing, sequencing and duration of components, including:

- a) pre-construction, construction, operation, decommissioning, reclamation and closure;
- b) the activities to date, including resource delineation through seismic activity and core hole drilling programs;
- c) a detailed schedule for any reclamation and related activities envisaged during the first decade of operations; and
- d) key factors controlling the schedule and uncertainties related to the Project.

2.3 Evaluation of Alternatives

2.3.1 Project Alternatives

Discuss the need for the Project and the potential alternative of not proceeding with it. Include the following:

- a) an analysis of the alternative means of carrying out the Project, including need for the project, alternate projects and scope of the project (major components included and excluded). For the project components, include a comparison of their environmental and technical performance potential and other relevant variables;
- b) rationale for the decisions made by Suncor about project component alternatives including how environmental, socioeconomic, community information and elements of Traditional Ecological Knowledge (TEK) influenced project design. Discuss the status of any ongoing analyses, including a discussion of the options not chosen and the rationale for their exclusion;
- c) contingency plans if major project components or methods prove infeasible or do not perform as expected; and
- d) the implications of a delay in proceeding with the Project, or any phase of the Project.

2.3.2 Site Selection

Discuss the site selection process for various project components including:

- a) the process and factors that were considered in evaluating and delineating the oil sands ore body to determine the preferred locations for the mine, in-situ infrastructure, plant site and associated processing facilities and upgrader facility;
- b) the route for any linear or other infrastructure development or modification and the rationale for selecting the proposed alignment and design;
- c) the planned accommodations and transportation for all of the workforce during construction and operations, including plans to minimize disturbance and provide for site reclamation after construction is complete;
- d) siting factors versus existing activities or other resources and the need to either adjust the development or relocate the existing activity; and
- e) how stakeholder consultation input, and technical, geotechnical and environmental criteria were considered during decision-making.

2.3.3 Process Selection

Provide material balances, flow diagrams and descriptions of the processes to be used for each production stage of development under normal operating conditions (annual average calendar day rates) and at maximum expected rates (stream day rates). Describe:

- a) oil sands mining and bitumen extraction;
- b) the alternative technologies considered and the rationale for selection of the technologies chosen;

- c) the project inputs, such as energy and water, including the sources of these inputs, and the outputs such as emissions and chemical wastes; including the short- and long-term fate of these outputs (recycling, disposal), and efforts to minimize these inputs and outputs;
- d) the options for wastewater treatment and/or wastewater disposal, the rationale for selecting the preferred options, a discussion of options not chosen and the rationale for their exclusion;
- e) the energy and process efficiency of the technologies chosen, options considered for supplying the thermal energy and electric power required for the Project (e.g. the use of waste heat or cogeneration of heat and electrical power) and their environmental implications including greenhouse gas emissions;
- f) the effect of technology on tailings characteristics including, but not limited to, quantity, quality, physical characteristics, generation and storage requirements, air and water discharges, toxicity, water and energy requirements, chemical and hydrocarbon waste streams, bitumen recovery and effects to reclamation programs;
- g) opportunities to reduce surface disturbance, emissions, chemical and hydrocarbon wastes and energy consumption through structural and process integration of mining and extraction facilities and processes, or through other means;
- h) the flexibility built into the plant design and layout to accommodate future modifications required by any change in emission standards, limits and guidelines; and
- i) the adaptability of the Project in the event the region's climate changes in accordance with the Federal government document "*Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*". Discuss any follow-up programs and adaptive management considerations.

2.4 Project Components

Describe the nature, size, location and duration of the components of the Project. Discuss:

- a) design capacities associated with the Project;
- b) the oil sands mine area required to support the life of the Project;
- c) rates and total volume of bitumen recovery;
- d) the bitumen extraction and associated facilities, tailings management, overburden storage areas, chemical storage locations and any off-site facilities;
- e) processing/treating facilities;
- f) dewatering and water control facilities;
- g) the type and amount of solid and liquid waste materials produced and the location of those waste storage and disposal sites;
- h) field maintenance operations;
- i) buildings;
- j) the amount and source of energy required for the Project and any associated infrastructure;
- k) product pipelines and associated infrastructure;
- l) temporary structures; and
- m) containment structures such as berms and retention ponds.

Provide maps showing:

- a) the location of existing and proposed project facilities and infrastructure;
- b) all existing surface leases and clearings including exploration clearings;
- c) all existing seismic lines and other linear corridors (e.g., pipeline and utility corridors and traplines);
- d) the locations of development components relative to all terrestrial and aquatic components; including, but not limited to, soils, topography, waterbodies, vegetation, wildlife habitat, watersheds and wetlands and traditional land use areas of Aboriginal peoples; and

- e) constraints, including traditional land use areas, to the siting of surface facilities (Prepared with reference to the CEMA document “*Guidelines for the Implementation of Ecosystem Management Tools in the Athabasca Oil Sands Region*”).

2.5 Transportation Infrastructure

Describe:

- a) access routes to the area. Include a map showing transportation access to the site from provincial highways;
- b) how public access to, or within the Project area or lease, will be managed during different development phases of the Project;
- c) access corridors needed and/or planned by other resource stakeholders;
- d) the steps taken to integrate the needs of other resource users into the location and design of access infrastructure to reduce and manage overall environmental impacts from resource development;
- e) any expected change in traffic volume by Average Annual Daily Traffic (AADT) and any seasonal variability in traffic volume. Detail the outcome of consultations with the local transportation authorities;
- f) proposed method of product transportation to markets;
- g) the sources, location and availability of road construction and reclamation materials, including an estimate the volume of materials needed and the expected number of hauls needed to transport this material along provincial highways;
- h) how the Project will affect aggregate reserves that may be located on Suncor leases and reserves in the region. Provide a plan of how these potentially-affected reserves will be salvaged and stockpiled with input provided by Alberta Transportation and Alberta Sustainable Resource Development;
- i) reducing or mitigating visual impact during construction and operation of infrastructure; and
- j) any crossings of watercourses or waterbodies required (with appropriate maps and diagrams).

If regional infrastructure is required, identify who is likely to be responsible for installation and approval of these facilities.

2.6 Water and Wastewater (See Appendix)

2.6.1 Water Supply

Describe the water supply requirements for the Project including:

- a) a water balance for each phase of the Project and overall. Discuss the assumptions made or methods chosen to arrive at the water balance;
- b) saline and non-saline water requirements for both normal and emergency operating situations and any seasonal or annual variability throughout the life of the Project;
- c) how these requirements will be met, specifically identifying sources of water during low-flow years or droughts, and how Instream Flow Needs (IFN) will be met during periods of water scarcity;
- d) the location of sources/intakes and associated infrastructure;
- e) proposed well locations, aquifer intervals including completion depth and estimated quantities for groundwater withdrawal; and
- f) raw water treatment requirements.

2.6.2 Water Management

Describe proposed water management for the Project including:

- a) site runoff volumes and containment, erosion control, groundwater protection, muskeg dewatering, mine pit dewatering and the discharge of aqueous contaminants; slumping area, groundwater seepage, potable water and produced water;

- b) factors used in the design of water management facilities, with respect to the *Canadian Dam Association Dam Safety Guidelines*, including expected flood levels and flood protection;
- c) permanent or temporary alterations or realignments to waterbodies, watercourses and wetlands;
- d) measures for ensuring efficient use of water, including alternatives to reduce non-saline water consumption such as water minimization, use of saline water, recycling and other conservation techniques;
- e) potential cooperation with other oil sand companies with regard to water-related infrastructure and management including water intakes, pipelines, water storage and withdrawals;
- f) flexibility of infrastructure (e.g. dams, dykes, canals, etc.) to respond to or adapt to extreme weather conditions including the risks and implications of changing climate; and
- g) measures taken by Suncor to contribute to the improvement in efficiency and productivity of water use as identified in *Water for Life: Alberta's Strategy for Sustainability* to ensure efficient use of water for the project.

2.6.3 Wastewater Management

Describe proposed wastewater management to address site runoff, groundwater protection, deep well disposal and wastewater discharge including:

- a) the source, quantity and composition of wastewater streams from proposed facilities;
- b) the design of facilities that will handle, treat and store wastewater streams, including any National Pollutant Release Inventory (NPRI), Priority Substance List (PS1) and PSL2;
- c) the quantity, quality and timing of any proposed wastewater releases and their potential environmental effects;
- d) how produced water generation will be managed and how make-up water requirements and disposal volumes will be minimized;
- e) discharges to the surrounding watershed from existing and reclaimed sites, including the tailings management areas and end pit lakes and the management strategy for handling such releases;
- f) the potable water and sewage treatment systems for both the construction and operation stages;
- g) proposed monitoring programs; and
- h) the principles that have been incorporated into the project design for pollution prevention, waste minimization and recycling.

2.7 Air Emissions Management

Identify and describe emissions for the Project, including point and area sources, fugitive emissions (including tailings management areas and mine faces) and mining vehicles. Estimate the range of emissions from all sources identified above for normal, worst case and upset conditions. Discuss the following from a management perspective:

- a) any NPRI, PSL1 and/or PSL2 substances relevant to the Project;
- b) potential odorous or visual emissions;
- c) the amount and nature of any acidifying emissions, as well as probable deposition areas and effects to soils, vegetation and waterbodies;
- d) emissions associated with slash burning as well as opportunities to manage and reduce these; and
- e) the Project's contribution total provincial and national GHG emissions on an annual basis.

2.7.1 Emission Control Technologies

Describe the emission control technologies proposed for the Project in the context of best available technologies economically achievable (BATEA). Discuss the following:

- a) use of low oxides of nitrogen (NO_x) technology having regard for the Canadian Council of Ministers of the Environment (CCME) *National Emissions Guidelines for Stationary Combustion Turbines* and CCME *National Emissions Guideline for Commercial/Industrial Boilers and Heaters*;

- b) use of other potentially applicable NO_x emission reduction technology (Ultra Low NO_x burners, Selective Catalytic Reduction, Selective Non-Catalytic reduction technology) for stationary NO_x sources;
- c) early adoption of improved non-road Heavy Duty Diesel Engines and low sulphur fuel to minimize mobile emission sources;
- d) fugitive emissions control program to detect, measure and control emissions and odours from equipment leaks having regard for the CCME *Code of Practice for Measurement and Control of Fugitive VOC Emissions*;
- e) use of technology to meet or do better than CCME *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks* and Alberta Environment *Guidelines for Secondary Containment for Aboveground Storage Tanks*;
- f) sulphur recovery or acid gas re-injection or flue gas desulphurization to reduce sulphur emissions having regard for current EUB sulphur recovery guidelines ID 2001-3;
- g) emergency flaring scenarios and proposed measures to ensure flaring events are minimized having regard for EUB Directive 60 and design criteria to ensure that flares operate at high efficiency;
- h) gas collection, conservation and technology for vapour recovery for the Project's air emissions;
- i) technology or management programs to minimize the direct emissions and secondary formation of particulate matter and trace metals of concern having regard to the provisions of the Canada Wide Standard for particulate matter and ozone; and
- j) monitoring programs Suncor will implement, or participate in, to assess air quality and the effectiveness of mitigation during project development and operation. Discuss how Suncor plans to incorporate air quality monitoring programs into the management of air emissions from their facility.

2.8 Hydrocarbon, Chemical and Waste Management

Characterize and estimate the volumes of hydrocarbon and chemical waste streams and any other waste generated by the Project. Identify how each waste stream will be managed. Provide the following information:

- a) a classification of the wastes generated and a characterization of each stream under the EPEA Waste Management Regulations;
- b) the location, nature and amount of on-site hydrocarbon storage. Discuss containment and other environmental protection measures;
- c) a listing of chemical product consumption for the Project. Identify products containing substances that are designated Canadian Environmental Protection Act (CEPA) toxic chemicals, are on the PSL 2, on the NPRI, or Track 1 substances targeted under Environment Canada's Toxic Substances Management Policy;
- d) how chemical products will be stored and managed to ensure employee health and safety, and environmental protection;
- e) the chemical make up and quantity of drilling wastes produced by the Project;
- f) the management plan for exploratory drilling wastes, produced tailings, overburden and other mining wastes, as well as, for any by-products. Include evaluations to minimize fine fluid tailings production, considering mining methods and proposed extraction processes;
- g) the location of on-site waste disposal areas, including industrial landfills. Identify on- and off-site waste treatment areas; and
- h) how the principles of pollution prevention, waste minimization and recycling have been incorporated into the project design. Discuss methods and technologies to reduce waste quantities to the lowest practical levels.

2.9 Reclamation and Closure (see Appendix)

Describe proposed progressive reclamation and closure for the Project. Outline reclamation concepts and objectives, proposed end land use objectives and consultation process to be implemented. Discuss the following:

- a) baseline information with respect to land capability, vegetation, commercial and non-commercial forest, forest productivity, recreation, wildlife, birds, fisheries, aesthetics, traditional lands and their use, and land use resources;
- b) the timeframe for completion of reclamation phases and release of all lands affected by the Project back to the Crown;
- c) re-establishment of topography, watercourse and vegetation communities to natural function and appearance that are integrated with the surrounding landscape and adjacent land disturbances including benchmarks for these at 5, 10 and 20 years post reclamation;
- d) the return to equivalent land capability that existed prior to the project development, including forest productivity and wildlife habitat. Discuss where equivalent capability cannot be achieved and why;
- e) a conceptual schedule for the return of the forest resource landbase by area, species and productivity;
- f) restoration of traditional land uses;
- g) soil replacement and revegetation; and
- h) the aquatic components of the closure landscape, including the restoration of watercourses, waterbodies and wetlands.

Discuss how Suncor's proposal will:

- a) return land to the equivalent capability for the range of users and uses that existed prior to the project development having regard for ecological integrity, regulatory requirements and stakeholder end land use preferences. Describe what reclamation performance indicators will be used to ensure this requirement will be met;
- b) incorporate the resources and values identified in the *Fort McMurray/Athabasca Oil Sands Sub-regional Integrated Resource Plan (IRP)*; and
- c) address the issues raised by the Cumulative Environmental Management Association (CEMA) and the Regional Sustainable Development Strategy for the Athabasca Oil Sands (RSDS).

Discuss issues related to the design of a self-sustaining and productive aquatic ecosystem, including implications of the selected tailings technology. Explain the process and activities Suncor will undertake to address issues of uncertainty surrounding the long-term ecological viability of end pit lakes. Include a hydrological analysis of the closure landscape, including an assessment of performance uncertainties and discussion of contingency plans should performance not match expectations. Contrast the pre-development aquatic ecosystem to the closure ecosystem.

Identify the closure goals for biodiversity. Explain how achieving biodiversity goals will promote end land use that has equivalent land capability. Discuss plans to monitor biodiversity in the reclaimed landscape and to use control sites as benchmarks for comparison with reclaimed areas, and using Alberta Biodiversity Monitoring Institute protocols.

2.10 Environmental Management System and Contingency Plans

Summarize key elements of Suncor's Health, Safety and Environmental management system and discuss how it will be integrated into the Project. Provide the following information:

- a) corporate policies and procedures, operator competency training, spill and air emission reporting procedures and emergency response plans;
- b) plans to prevent or minimize the production or release into the environment of substances that may have an adverse effect;

- c) a conceptual contingency plan that considers environmental effects associated with operational upset conditions, such as serious malfunctions or accidents or extreme weather events;
- d) how Suncor intends to address low frequency, high consequence events;
- e) quality assurance and quality control (QA/QC) programs Suncor plans to implement to ensure the ongoing operation of environmental management systems meet regulatory standards (such as the CCME leak detection and repair program) and how their QA/QC program compares to industry best management practices;
- f) environmental monitoring done independently by Suncor in addition to monitoring performed in conjunction with other stakeholders and publicly available monitoring information. Provide a comprehensive summary of all proposed monitoring, research and other strategies or plans to minimize, mitigate and manage any potential adverse effects.

2.11 Participation in Regional Cooperative Efforts

Discuss Suncor's current and planned involvement in regional cooperative efforts that address environmental and socio-economic issues, including the CEMA, the Wood Buffalo Environmental Association (WBEA), the Regional Aquatics Monitoring Program (RAMP) and their working groups. Include Suncor's participation in regional air, water and other environmental monitoring programs, health studies, research, TEK and socio-economic studies.

Describe where Suncor intends to rely upon CEMA, WBEA, RAMP, and Canadian Oil Sands Network for Research and Development (CONRAD) to design mitigation measures for cumulative effects, regional monitoring programs or research programs.

3.0 ENVIRONMENTAL AND CUMULATIVE EFFECTS ASSESSMENTS

3.1 Assessment Methodology

3.1.1 Scenarios

Define assessment scenarios including:

- a) a Baseline Case, which includes existing environmental conditions, existing and approved projects or activities;
- b) an Application Case, which includes the Baseline Case plus the Project; and
- c) a Planned Development Case (Cumulative Effects Assessment), which includes past studies, existing and anticipated future environmental conditions, existing projects or activities, plus other planned projects or activities.

Note: For the purposes of defining assessment scenarios, "approved" means approved by any federal, provincial or municipal regulatory authority. "Planned" is considered any project or activity that has been publicly disclosed prior to the issuance of the terms of reference or up to six months prior to the submission of the Project Application and EIA report, whichever is sooner.

3.1.2 Study Areas

The EIA Study Area includes the Project Development Area (PDA), the Local Study Area (LSA) and the Regional Study Area (RSA). The Project Development Area (PDA) includes all lands subject to direct disturbance from the Project and associated infrastructure, including access and utility corridors.

The LSA and the RSA include the PDA and other areas based on individual environmental components where an effect from the proposed development can reasonably be expected regardless of any political boundaries.

For each study area provide:

- a) a description of the area in terms of legal land description(s) and boundaries;
- b) a rationale for the boundaries;
- c) a map with township and range lines that identifies the locations of all proposed development activities and the general areas of development for subsequent project phases; and
- d) a map showing the area proposed to be disturbed in relation to existing topographic features, township grids, wetlands, watercourses and waterbodies.

Define and provide the rationale for the temporal boundaries for the Study Areas used for the assessment. Temporal boundaries should extend through the exploration, construction, operation and reclamation and closure plan phases of the Project.

3.1.3 Information Requirements

The EIA report will include the following for the three assessment scenarios:

- a) quantitative and qualitative information about the environment and ecological processes in the Study Areas from project specific research and data collection, current scientific literature, TEK and relevant information presented in previous environmental assessments;
- b) information about the human activities in the Study Areas and the nature, size, location and duration of their potential interactions with the environment (e.g., land disturbance, discharges of substances, changes to access status) and any significant effect the Project may have on the present and future capacity of renewable resources;
- c) information about ecological processes and natural forces that are expected to produce changes in environmental conditions (e.g., forest fires, flood or drought conditions and predator-prey population cycles);
- d) a discussion of residual effects and their environmental consequences, having regard for regional management initiatives. Effects should be explained in terms of direction, magnitude, extent, duration, frequency, seasonal timing, geographic extent and reversibility;
- e) definition of the system employed to classify and evaluate the effects associated with the Project;
- f) a description of any deficiencies or limitations in the existing environmental database, how these deficiencies and/or limitations were addressed, their impact on the analysis and any appropriate follow-up;
- g) the demonstrated use of appropriate predictive tools and methods to enable quantitative estimates of future conditions with the highest possible degree of certainty;
- h) a discussion of data used in the assessments, any assumptions or transformations required to combine or manipulate data for interpretation in the report, and rationale for disregarding relevant data;
- i) assumptions behind statistical tests used in the EIA report and an explanation of how the data meets statistical requirements (e.g., normality, independence, etc); and
- j) the regional, provincial or national recommendations, objectives, standards or guidelines that have been used by Suncor to assist in the evaluation of any predicted environmental impacts.

3.1.4 Modeling

For each model used in the assessment scenarios, provide:

- a) a justification for the model used;
- b) a discussion of the calibration process for the model, including the limitations associated with using the model;
- c) a pictorial representation for all model compartments and linkages including all subroutines and modules;
- d) a list of all parameters incorporated in the model with a brief description of their purpose, known range of values, whether set from literature, calibrated, or measured (derived from local data) and the value(s) used in the EIA predictions;

- e) a sensitivity analysis demonstrating which parameters have the largest influence on model output; and
- f) a discussion of error for the parameters to which the model is most sensitive and for the final model output.

3.2 Climate, Air Quality and Noise

Describe air quality in the Study Areas and any anticipated environmental changes for air quality. Model normal, worst case and upset conditions. Discuss the following:

- a) baseline climatic conditions, including the type and frequency of meteorological conditions that may result in poor air quality;
- b) fate and effects of appropriate air quality parameters including, but not limited to, sulphur dioxide (SO₂), hydrogen sulphide (H₂S), Total Reduced Sulphur Compounds (TRS), total hydrocarbons (THC), oxides of nitrogen (NO_x), volatile organic compounds (VOC), individual hydrocarbons of concern in the THC and VOC mixtures, particulates (PM₁₀ and PM_{2.5}), secondary particulate matter, trace metals, acid deposition and ground-level ozone;
- c) estimates of ground-level concentrations of the appropriate air quality parameters, include frequency distributions for air quality predictions in communities and sensitive receptors; and include an indication of maximum and 99.9 percentile for hourly predictions (98 percentile for any modelling predictions);
- d) any expected changes to particulate deposition or acidic depositions patterns;
- e) for acid deposition modelling, provide deposition data predictions including magnitude and location of predicted maximum levels for all areas within the 0.25 keq/ha/yr and 0.17/keq/ha/yr Potential Acid Input (PAI) isopleth; include analysis of PAI deposition levels consistent with the CEMA acid deposition management framework;
- f) the regional, provincial and national objectives for air quality that were used to evaluate the significance of emission levels and ground-level concentrations, including the Canada Wide Standard for particulates and ozone (O₃);
- g) predicted air quality compared with the appropriate air quality guidelines available;
- h) any implications of the expected air quality for environmental protection and public health including:
 - i) sensitive aspects in the receiving environment that are likely to be exposed to air quality and deposition changes (receptors include human, animal and vegetation);
 - ii) the likely exposure levels, either acute or chronic, experienced by receptors, their effects and the ability of receptors to recover from those effects;
 - iii) the potential for decreased air quality, including odours; and
 - iv) implications for the sustainability of regional air quality within emerging regional objectives.
- i) air quality impacts and their implications for other environmental resources, including habitat diversity and quantity, vegetation resources, water quality and soil conservation;
- j) how air quality impacts will be mitigated; and
- k) ambient air quality monitoring that will be conducted during the Project.

Identify components of the Project that will affect noise at sensitive receptors and discuss the implication and measures to mitigate. Present the results of a noise assessment based on operations, as specified by *EUB Directive 038 Noise Control*, including potentially affected people, workers living on-site and wildlife. Provide an estimate of the noise resulting from the development, their implications and proposed mitigation measures.

3.3 Land Use, Access to Public Lands and Aggregate Resource Conservation

Describe land use and access to public lands and the availability of aggregate resources in the Study Areas. Explain the significance of land use changes for regional land management, aggregate resource

conservation, other industrial uses in the region, the ability to maintain a traditional lifestyle, and recreational uses. Provide information on land uses and seasonal variations. Discuss the following:

- a) unique sites or special features in the Study Areas, such as Natural Areas, Environmentally Significant Areas or culturally significant areas. Discuss any impacts of the Project on these features. Indicate the location and values of other protected areas, if present;
- b) the existing land uses, including the metallic and industrial minerals development, oil sands development, tourism, forestry, fishing, hunting, cultural and traditional use and outdoor recreation;
- c) how access by traditional land users, Suncor employees and the public will be managed;
- d) the nature, location and duration of anticipated land use changes;
- e) whether and to what extent, the development is consistent with the intent of applicable land use and resource management and planning directives. Identify:
 - i) the relevant boundaries for the application of guidelines and objectives, including management areas, sub-areas and relevant ecosystem classifications with functional linkages mapping;
 - ii) mitigation or research requirements proposed to satisfy the applicable guidelines; and
 - iii) the proposed setbacks from waterbodies and watercourses with regard for applicable guidelines and management objectives. Discuss the rationale for the location of proposed facilities in the context of the proposed setbacks;
- f) the existing recreational use including traffic counts, destination and activity analysis and the implications of the Project on those activities in all seasons, during and after, development activities;
- g) effects that may result from linear development such as increased hunter, angler and other recreational access and facilitated predator movement;
- h) the aggregate resources impacted by the mine development. Discuss the quantity and quality of aggregate resources and any mitigation necessary to conserve the resource. Provide exploration maps including resource type and depth;
- i) the process for addressing other users, such as trappers and holders of Forest Management Agreements (FMA) and Timber Quota holders. Determine the impact of development on existing land uses and identify mitigation strategies; and
- j) how reclamation and closure planning processes, completed or underway, will replace existing land use potential considering the recommendations of applicable guidelines.

3.4 Geology, Soils, Terrain

Describe the bedrock and surficial geology, soils and terrain in the Study Areas. Where appropriate, use maps, cross-sections and figures to illustrate these features. Provide a map of the pre- and post-disturbance land capability and resiliency of the Project Area and a description of the changes to land capability classes resulting from the Project. Explain the significance of any changes for the regional landscape, productivity, ecological integrity, aesthetics and the future use of the regional landscape area. Discuss the following:

- a) the overburden geology and minerology including the strata that have a high potential to leach salts;
- b) the distribution of soil types in the proposed project areas including necessary landscape and soil characteristics for land capability ratings;
- c) the sensitivity and buffering capacity of the local and regional soil types to potential acid deposition from the proposed development and the predicted deposition patterns;
- d) the predicted acidifying and eutrophying impacts to local and regional soils;
- e) the implications of environmental effects on ecosystem sustainability and regional management, including:

- i) any constraints or limitations to achieving vegetation restoration including wetlands based on anticipated soil conditions and topography. Provide examples from the region;
 - ii) an assessment of soil types for reclamation suitability and the approximate volume of suitable soil materials for reclamation;
 - iii) the potential for soil erosion and measures to minimize the effects of any such erosion; and
 - iv) any other issues that will affect the soil capability of the Study Areas or the reclaimed landscape and the mitigation measures proposed; and
- f) the effects of surface disturbance on geological features and soils, including:
- i) the type and extent of changes to the pre-development topography;
 - ii) the overburden characteristics in relation to the needs of post-mining reclamation programs.

3.5 Vegetation

Describe and map vegetation communities in the EIA Study Areas, using, as appropriate, the Alberta Vegetation Inventory (AVI) Standard AVI 2.1, *The Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald, 1996) and the *Alberta Wetland Inventory Standards Manual* (AWI) Version 1.0. Map the footprint at a scale of 1:20,000.

Discuss the following:

- a) ecosite phases based on their potential to support rare plant species, old growth forests or other communities of restricted distribution (e.g., fens). Verify the presence of species of rare plants and the ecosites in which they are found using recommended survey methods;
- b) the species associated with each ecosite phase and address:
 - i) special status plant species (rare, threatened or endangered);
 - ii) species that are important to wildlife as food or shelter or are indicator species for environmental effects. Include an estimation of the relative abundance of these species;
 - iii) the importance of the size, distribution and variety of vegetation units assessed in habitat suitability indices for wildlife and riparian habitat and for ecosystem function, in general;
 - iv) the importance of wetland species within landscape units for local and regional habitat, sustained forest growth, traditional uses, the hydrologic regime and water quality. Determine the rarity or abundance of peatlands and wetlands from a regional, provincial and national perspective; and
 - v) the vegetation used for food, medicinal and cultural purposes;
- c) the sensitivity to disturbance of each of the vegetation communities and their capability to be restored in this region, the techniques used to estimate sensitivity to disturbance and reclamation (e.g., sensitivity to air emissions), particularly for those communities for which a high degree of uncertainty currently exists around potential and methods for successful reclamation;
- d) the nature, size, distribution and timing of changes to vegetation communities, including the effects of air emissions;
- e) the significance of the changes to vegetation for:
 - i) the availability of plants for traditional and medicinal purposes;
 - ii) the sustainability of peatlands and other wetlands in conjunction with other project induced variations in air quality, hydrology, water quality and quantity, habitat quality and wildlife populations;
 - iii) the area of productive and non-productive forest land base that will be disturbed and taken out of production during the life of the Project. Describe Suncor's plans for the return of pre-disturbance forest ecosites by area, species and productivity;
 - iv) ecosystem fragmentation;

- v) introduction of non-native plant species on native species composition and potential plant changes to communities;
- vi) the area and distribution of all vegetation communities existing prior to the project development and expected at closure, including relative percent change in those communities; and
- vii) habitat diversity and quantity, water quality, erosion potential, soil conservation, recreation and other uses, both at baseline and closure;
- f) Suncor's plans to mitigate the adverse effects of site clearing and other development activities and operations on vegetation, including rare plant species and those used for traditional food, medicinal and cultural purposes; and
- g) how environmental plans for the Project will address applicable provincial and federal policies for wetlands.

3.6 Wildlife

Describe existing wildlife resources (amphibians, reptiles, birds and terrestrial and aquatic mammals), their use and potential use of habitats in the Study Areas. Document the anticipated changes to wildlife in the Study Areas. Map the changes in habitat fragmentation, and the potential for habitat patch isolation anticipated.

Discuss the following:

- a) the criteria and selection process for wildlife indicator species;
- b) wildlife species composition, distribution, relative abundance, seasonal movements and movement corridors, and general life history requirements; and
- c) current field data, using recognized sampling protocols, for all species of concern, including those listed by Alberta (at risk, may be at risk, and sensitive list species in the *General Status of Alberta Wild Species 2005*, or update) and federal *Species at Risk Act* (endangered, threatened, and special concern species). Provide rationale behind the sampling protocols and field methods implemented;
- d) potential impacts on wildlife populations, habitat use and availability and quality, and food supply;
- e) habitat loss, abandonment, reduced effectiveness, fragmentation or alteration as it relates to reduced reproductive potential and recruitment for regional wildlife populations;
- f) the spatial and temporal changes to habitat (type, quality, quantity, diversity and distribution) and to wildlife indicator species distribution, relative abundance, movements, habitat availability and the potential to return the area to pre-disturbed wildlife habitat and population conditions, including:
 - i) anticipated effects on wildlife as a result of changes to air, water, including both acute and chronic effects on animal health; and
 - ii) anticipated effects on wildlife due to improved or altered access into the area during operations and after project closure;
- g) how Suncor will prevent the disturbance or destruction of migratory bird nests; and
- h) how Suncor will protect or replace riparian habitats, interconnectivity of such habitat and the unimpeded movement by wildlife species using the habitat.

Provide the following information:

- a) identify residual impacts to wildlife and wildlife habitat and discuss their significance in the context of local and regional wildlife populations;
- b) a strategy and mitigation plan to minimize impacts on habitat and wildlife populations through the life of the Project and to return productive wildlife habitat to the area, considering:
 - i) habitat enhancement measures within the Lease areas, and a schedule for the return of habitat capability to areas impacted by the Project;

- ii) consistency of the plan with applicable regional, provincial and federal wildlife habitat objectives and policies;
 - iii) the need for access controls or other management strategies to protect wildlife during and after project operations;
 - iv) monitoring programs to assess wildlife impacts from the Project and the effectiveness of mitigation strategies and habitat enhancement measures;
 - v) environmental management procedures that Suncor will use should monitoring indicate that mitigation measures are unsuccessful;
 - vi) the deterrent systems that will be incorporated into the Project to reduce the impacts on birds attracted to open ponds or wastewater ponds; and
 - vii) an assessment of the timeframe required to develop habitat of suitable quality and quantity on reclaimed lands, and the effects on re-colonization for each species identified; and
- c) targets for wildlife populations over the lifetime of the project in relation to time required to recolonize and sources for recolonization.

3.7 Biodiversity

Determine a suite of biotic and abiotic biodiversity indicators for terrestrial and aquatic ecosystems that characterize naturally functioning ecosystems in the Study Area(s) and represent broader taxonomic assemblages. Discuss:

- a) the regional presence and abundance of species in each ecosite phase or ecological type;
- b) species lists and summaries of observed and estimated species richness and evenness;
- c) the ranking of each ecological unit for biodiversity potential based on species richness, overlap in species lists, importance of individual species or associations, uniqueness and other appropriate measures;
- d) the contribution of the Project to any anticipated changes in regional biodiversity, including measures to minimize such change;
- e) the implications of the Project's incremental contribution to habitat fragmentation on biodiversity with regard to regional levels of habitat fragmentation;
- f) Suncor's participation in regional biodiversity programs (e.g., Alberta Biodiversity Monitoring Program);
- g) pre- and post- topography, soil and parent material conditions and their contribution to biodiversity; and
- h) aquatic and terrestrial ecosystem diversity.

3.8 Groundwater (See Appendix)

Describe and map the groundwater regime in the Study Areas including any new hydrogeological investigations. Provide the following information:

- a) major aquifers, aquitards and aquicludes, and groundwater flow direction and velocity. Include Quaternary deposits and bedrock formations down to and including the bitumen producing zones and any disposal zones;
- b) the lithology, stratigraphic and structural continuity, thickness, hydraulic properties and groundwater quality of the geologic units in the Study Areas;
- c) maps and cross-sections that include groundwater table and piezometric surfaces based on identifiable groundwater systems and accurate data sources, such as drill holes; and
- d) potential aquifers for any deep disposal of wastewater. Characterize any formations chosen for deep well disposal, including water quality, chemical compatibility and containment potential within the disposal zones.

Discuss the following:

- a) the potential or expected changes in the groundwater quality for any aquifer;

- b) vertical gradients and aquifer recharge rates and changes resulting from any proposed diversion;
- c) the potential impact of decreased recharge to aquifers under prolonged drought conditions and the potential impacts of groundwater withdrawal due to project activities under such conditions;
- d) the effect of groundwater withdrawal/dewatering and its implications for other environmental resources, including habitat diversity and quantity, surface water quality and quantity, vegetation, wetlands and soil saturation;
- e) the inter-relationship of the groundwater to the surface water and the potential for impacts on water quality and quantity due to recharge from and discharge to local waterbodies and wetlands;
- f) the probability of re-injecting mine depressurization water from the aquifer beneath the bituminous sands, the target aquifer segment, its location and capacity to absorb and release injected water, the potential for contaminant migration in groundwater from, and its impact on receiving surface waters;, including methodology and results;
- g) the suitability of on-site waste disposal and supporting geotechnical information;
- h) the potential for hydraulic connection between geological zones affected by the Project (e.g., disposal, bitumen production, groundwater production and the land surface);
- i) surrogate parameters to be used as indicators of potential aquifer contamination including total phenols, dissolved organic carbon, total extractable hydrocarbons, chlorides, sulphides, benzene, toluene, ethylbenzene and xylenes (BTEX) and trace elements, including arsenic;
- j) other groundwater users in the area, potential water use conflicts and proposed resolutions; and
- k) a plan for the protection of groundwater resources, including:
 - i) the early detection of potential contamination and remediation planning;
 - ii) groundwater remediation options in the event that adverse effects are detected; and
 - iii) monitoring the sustainability of groundwater production or dewatering effects.

3.9 Surface Water Quantity

Describe hydrological conditions in the Study Areas. Provide an inventory of all surface water users in the Study Areas. Discuss:

- a) the impacts of water withdrawals on vegetation, wildlife, fish and fish habitat, ice break-up and ice jams and navigation with consideration for emergency operating, low-flow conditions and in-stream flow needs with consideration for the *Water Management Framework: Instream Flow Needs and Water Management System for the Lower Athabasca River (2007)*;
- b) the impact of Climate Change on the hydrology of the area;
- c) the impact of removal of watercourses and waterbodies, including Poplar Creek Reservoir, Beaver Creek Reservoir, Ruth Channel and Ruth Lake;
- d) the impacts of low-flow regime in their project area;
- e) the impacts on hydrological regimes of removing water-bodies from the project area;
- f) the impact of any alteration in flows, including all temporary and permanent stream realignments or other disturbances, their extent and duration;
- g) buffers for streams and waterbodies in the Local Study Area and their rationale;
- h) the pre- and post-disturbance alignment and condition of all ephemeral and permanent streams and waterbodies. Consider the 1:100 year flood level, including the potential for flooding during heavy precipitation events and spring runoff. Quantify and address the effects of probable maximum flood and precipitation events, including the risks and implications of changing climate, on ponds, containment structures and infrastructure with respect to the *Canadian Dam Association Dam Safety Guidelines*;
- i) the impacts for all watercourse crossings, roads and ditches intersecting waterbodies;
- j) the impacts of sediment transport and sediment loadings;

- k) Suncor's planned mitigation to prevent or minimize potential impacts, addressing:
 - i) how permanent stream realignments and other disturbances can enhance existing or rebuilt streams to increase habitat productivity for aquatic resources and recreational potential;
 - ii) measures to reduce impacts to waterbodies and wetlands including residual impacts from proposed mitigation measures (i.e. fish habitat compensation impacts on navigation); and
 - iii) a monitoring program to identify hydrological impacts and to assess performance of water management systems and predictive modelling (including the reanalysis of updated predictions if monitoring indicates significant differences from original predictions).

3.10 Surface Water Quality

Describe the water quality in the Study Areas. Discuss the following:

- a) potential changes in water quality over the life of the Project. Consider the magnitude, extent, timing, duration, significance and seasonal variation (including under-ice conditions). Consider appropriate water quality parameters (e.g., temperature, pH, conductivity, cations and anions, metals, dissolved oxygen, suspended sediment, dissolved solids, nutrients and other oil sands water contaminants, such as naphthenic acids);
- b) sediment quality including particle size, carbon content, organics, metals, sediment toxicity, and oil sands sediment contaminants, such as PAHs;
- c) water quality conditions in reclaimed waterbodies;
- d) the potential effects of acidic deposition on water quality, aquatic biota and habitat conditions of surface waterbodies. Identify waterbodies that are sensitive to acid deposition;
- e) the potential for seasonal variations in acid input to waterbodies (spring acid pulse);
- f) any water quality implications of the tailings deposits, including the amount and quality of water or leachate released, their permeability and groundwater characteristics;
- g) a comparison of existing and predicted water quality, using as appropriate, the *Surface Water Quality Guidelines for Use in Alberta*, the *CCME Canadian Water Quality Guidelines* and any available CEMA water quality objectives;
- h) proposed mitigation plans for any monitoring implemented for the project. Justify the selection of monitoring location, and the integration of these sites into the overall aquatic assessment and monitoring program;
- i) the residual effects for each stage of the Project, including post-reclamation. Predict and describe water and sediment quality conditions and suitability for aquatic biota in constructed waterbodies, such as pit lakes;
- j) proposed water quality and sediment quality monitoring programs for metals and other relevant substances; e.g., polycyclic aromatic hydrocarbons (PAHs) and naphthenic acids. Consider seasonality, sampling medium (water, sediment, biota) and other factors, such as, waterbodies sampled, sample sites, precipitation and runoff levels, downstream and point-source discharges; and
- k) the probability for accidental releases to waterbodies on a structural failure probability basis. E.g. failure rate per km/year of pipeline.

3.11 Aquatic Resources

Describe the existing aquatic resources (e.g., fish and benthic invertebrates). Discuss the following:

- a) the criteria and selection process for key indicator species;
- b) the composition, distribution, life stages, relative abundance, critical or sensitive seasonal habitat use and movement patterns of the aquatic resources;
- c) the effects of construction, operation and reclamation activities including watercourse alterations, removal of watercourses and waterbodies, changes to substrate conditions, stream flow conditions and water quality on aquatic resources and habitat;

- d) the nature of the potential effects, their duration; whether they are site-specific, local or regional in spatial extent; and the mitigation measures and habitat enhancement techniques that will be implemented to prevent or minimize any anticipated adverse effects;
- e) the potential for tainting of flesh, survival of eggs and fry, chronic or acute health effects, changes in the invertebrate community and food base; and increased stress on fish populations from release of contaminants, sedimentation, flow alterations, and temperature and habitat changes;
- f) potential impacts on riparian areas that could impact aquatic biological resources and productivity;
- g) the use of fish resources by existing and potential domestic, traditional and sport fisheries and the potential for increased fishing pressure in the area;
- h) the implications of potential effects on fish productivity and the need for access controls or other management strategies to protect the resources;
- i) plans to offset any incremental loss in the productivity. Indicate how environmental protection and compensation plans will seek to result in No Net Loss of habitat;
- j) programs to monitor aquatic habitat quality and the effectiveness of mitigation strategies;
- k) environmental management procedures should monitoring indicate that mitigation strategies are not effective;
- l) how increased habitat productivity for aquatic resources can be incorporated into permanent stream re-alignments and any other associated developments;
- m) residual impacts on aquatic resources and their significance in the context of local and regional aquatic resources, including fisheries.

3.12 Environmental Monitoring

Describe environmental monitoring and reporting that Suncor will undertake to verify and manage predicted effects, confirm performance of mitigative measures and improve environmental protection strategies to further the understanding of the Project's impact on the environment. Discuss the following:

- a) all monitoring activities and initiatives that Suncor is proposing to conduct independently of other stakeholder activities in the region including a discussion of how such monitoring activities are compatible with regional monitoring initiatives;
- b) all monitoring activities that Suncor is proposing to conduct collaboratively with other stakeholders. Include the role that Suncor anticipates taking in each of the programs;
- c) any monitoring activities that may be conducted outside Alberta to confirm that the Project does not impact directly or indirectly on sensitive receptors outside of Alberta;
- d) the thresholds that will be used to trigger mitigation or other adaptive management approaches; and
- e) mechanisms for sharing results, reviewing findings and adjusting programs should monitoring identify unanticipated consequences of Suncor's operations or mitigation plans, including:
 - i) corporate adaptive management strategies;
 - ii) steps that Suncor will take to involve regulators and public stakeholders; and
 - iii) steps to communicate unanticipated conditions to regulators and regional management forums if regional environmental conditions may be affected.

4.0 PUBLIC HEALTH AND SAFETY

Describe those aspects of the Project that may have implications for public health or the delivery of regional health services. Determine whether there may be implications for public health arising from the Project. Specifically:

- a) identify and discuss the data and methods Suncor used to assess impacts of the Project on human health and safety;

- b) assess the potential health implications of the compounds that will be released to the environment from the proposed operation in relation to exposure limits established to prevent acute and chronic adverse effects on human health;
- c) identify the human health impact of potential contamination of country foods and natural food sources taking into consideration all project activities;
- d) provide information on compounds released from the project found in samples of selected species of vegetation and wildlife known to be consumed by humans, and incorporate into the assessment;
- e) discuss the potential to increase human exposure to contaminants from changes to water quality, air quality and soil quality taking into consideration all project activities;
- f) document any health concerns identified by Aboriginal stakeholders due to impacts of the Project on their traditional lifestyle. Determine the impact of the Project on the health of Aboriginal stakeholders and identify possible mitigation strategies;
- g) assess cumulative health effects to receptors, including First Nations and Aboriginal receptors, that are likely to result from the project in combination with other existing, approved, and planned projects;
- h) as appropriate, identify anticipated follow-up work, including regional cooperative studies. Identify how such work will be implemented and coordinated with ongoing air, soil and water quality initiatives;
- i) identify and discuss potential health and safety impacts due to higher regional traffic volumes and the increased risk of accidental leaks and spills;
- j) document health and safety concerns raised by stakeholders during the consultation on the Project;
- k) provide a summary of Suncor Energy Inc.'s emergency response plan and discuss mitigation plans that will be implemented to ensure workforce and public safety during pre-construction, construction, operation and reclamation of the Project. Include prevention and safety measures for wildfire occurrences, accidental release or spill of chemicals to the environment and failures of structures retaining water or fluid wastes;
- l) describe how local residents will be contacted during an emergency and what type of information will be communicated to them; and
- m) describe existing agreements with area municipalities or industry groups such as safety co-operatives, emergency response associations and municipal emergency response agencies.

5.0 TRADITIONAL ECOLOGICAL KNOWLEDGE AND LAND USE

Provide details on the consultation undertaken with potentially affected Aboriginal communities, and the reports reviewed, with respect to traditional ecological knowledge and traditional land use. Describe:

- a) the specific traditional land uses such as fishing, hunting, trapping and plant harvesting in the Study Areas. Determine their extent and location where possible. Identify cabin sites, spiritual sites, graves, and traditional trails and resource use patterns;
- b) traditionally important wildlife and plant species;
- c) the project and cumulative impact of development on these uses and resources and identify possible mitigation strategies; and
- d) how Traditional Ecological Knowledge was incorporated into the technical components of the EIA report.

6.0 HISTORIC RESOURCES

Describe those aspects of the Project that may have implications for historic resources and provide the following:

- a) a general overview of the results of any previous historic resources studies that have been conducted in the Study Area(s) as defined within the *Historical Resources Act*;

- b) details of the consultation with the Heritage Resources Management Branch and aboriginal communities with respect to historic resources;
- c) a summary of the results of the Historical Resources Impact Assessment;
- d) documentation of the participation of Aboriginal peoples in the Historical Resources Impact Assessment and any concerns that Aboriginal peoples have indicated with respect to project impacts on historic resources;
- e) documentation of any stakeholder concerns with respect to the development of the Project based on the historic significance of the Local Study Area; and
- f) an outline of the historic resources management program and schedule of field investigations that may be required to assess and mitigate the effect of the Project on historic resources, including Aboriginal traditional use sites that may be considered as historic resources under the *Historical Resources Act*.

7.0 SOCIO-ECONOMIC ASSESSMENT

Provide information on the socio-economic effects of the Project. Discuss the following:

- a) the number and distribution of people who may be affected by the proposal;
- b) the social impacts of the Project on the Study Areas and on Alberta, including:
 - i) local employment and training;
 - ii) local procurement;
 - iii) population changes;
 - iv) demands on local services and infrastructure;
 - v) regional and provincial economic benefits;
 - vi) trapping, hunting and fishing; and
 - vii) effects on First Nations and Metis (e.g., traditional land use and culture);
- c) the impact of increased vehicle traffic on Highway 63 and roads in the oil sands development area, considering other existing and planned developments and operations in the region including what measures will be taken to reduce traffic and enhance vehicle safety on Highway 63;
- d) the economic impacts of the Project on the Study Area(s) and on Alberta, having regard for capital, labour and other operating costs and revenue from services. In addition, discuss Suncor's policies and programs respecting the use of local, Alberta and Canadian goods and services. Provide an estimated breakdown of Alberta, other Canadian and non-Canadian industrial benefits from project management/engineering; equipment and materials; construction labour and total overall project;
- e) the employment and business development opportunities the Project may create for First Nations, Metis, local communities and the region. Provide a breakdown of the type of employment and number of employees with respect to the construction and operational workforces. Identify the source of labour for the proposed Project;
- f) strategies to mitigate socio-economic concerns raised by the Regional Municipality of Wood Buffalo and other stakeholders in the region. Include a discussion on the potential impacts to housing availability and the social ramifications of that impact. Document the work with other industry partners and the Regional Municipality to continue use and development of the urban population prediction model developed for baseline socio-economic purposes; and
- g) impacts of the proposed Project on potential shortages of affordable housing and the quality of health care services. Identify and discuss the mitigation plans to address these issues. Provide a summary of any discussions that have taken place with the Municipality and the Regional Health Authority concerning potential house shortages and health care services, respectively.

8.0 PUBLIC CONSULTATION

Describe and document the public consultation program implemented within the EIA Study Area(s). Record any concerns or suggestions made by the public and demonstrate how these concerns have been addressed, or responded to. Discuss:

- a) how the concerns and issues identified by Suncor and stakeholders influenced the project development, design, impact mitigation and monitoring, or how it was addressed or discounted;
- b) the type of information provided and the issues discussed, including those that have been resolved and those that remain outstanding;
- c) in consideration of unresolved issues, the key alternatives that have been identified by Suncor and stakeholders for future consultations as well as mechanisms and timelines for that resolution;
- d) plans to maintain and support the public consultation process following completion of the EIA review; and
- e) any agreements reached with stakeholder regarding Suncor's operations and activities.

APPENDIX

The following information is necessary to be submitted as part of the Application under the *Water Act* or the *Environmental Protection and Enhancement Act* (EPEA). It may not be necessary to be considered as part of the EIA report completeness decision-making process under Section 53 of EPEA. Upon review of the information submitted, a final determination will be made if it is necessary for the following information to be considered as part of the EIA report completeness decision.

Water Supply, Water Management and Wastewater Management

Provide the following information for the Project:

- a) technical information on how the water requirements for the Project will be met addressing the Alberta Environment's groundwater Evaluation Guidelines as required and include annual volumes from each source (for non-saline groundwater sources and site de-watering activities;
- b) how water requirements for the project were determined, including sample calculations and working assumptions;
- c) the various supply options considered (including on-site storage) and the rationale for choosing the preferred option. Reference as appropriate, technical information required in a *Water Act* Application;
- d) technical evaluations of the impact of the intake on the river during high and low water levels, and the potential for ice issues during freeze-up;
- e) if non-saline water is being considered for steam generation, then a Tier 2 evaluation using the *Water Conservation and Allocation Guideline for Oilfield Injection (2006)* is required;
- f) the design of facilities that will handle, treat and store wastewater streams;
- g) the type and quantity of any chemicals used in wastewater treatment; and
- h) design details for the potable water and sewage treatment systems for both the construction and operation stages.

Also provide data input files for all water quality models used. Data input files must be provided in digital format. Spatial coverages (e.g. ESRI.e00 files) showing the topography (DEM), hypsography, soil, landcover and landuse for each of the time snapshots modeled must also be provided.

Groundwater

Provide a detailed plan and implementation program for the protection of groundwater resources, addressing:

- a) the groundwater monitoring program for early detection of potential contamination and assistance in remediation planning;
- b) groundwater remediation options to be considered for implementation in the event that adverse effects are detected; and
- c) a program to monitor the sustainability of groundwater production.

Conservation and Reclamation Plan

Provide the following information for the Project within the context of a 10 year EPEA approval period:

- a) a plan for the integration of mining, reclamation activities and closure planning within the approval period, and within the project life span. The plan should be consistent to that provided in the EUB application and demonstrate integration with the life of mine closure plan;
- b) a detailed schedule for annual mine and in-situ development plans, and related reclamation activities;

- c) a detailed conservation and reclamation plan including, but not limited to, the following:
 - i) a discussion of soil reclamation requirements and a table of pre-disturbance land capability classes and post-disturbance land capability classes, demonstrating a return of equivalent land capability for commercial forest production in the development areas;
 - ii) predicted landscape, soil horizon/layer sequences of reclaimed soils that are likely to achieve equivalent land capability for commercial forest production at the development areas and discuss the possible assumptions and limitations of such approaches;
 - iii) a description and tables for approximate calculation/rating for pre- and post-disturbance land capability classes at the development areas;
 - iv) a discussion and tables of approximate reclamation material balance to achieve post-disturbance land capability ratings as specified in c) i) and ii);
 - v) the criteria to be used in soil salvage for reclamation;
 - vi) an assessment of sources/availability of suitable reclamation materials based on pre-disturbance soil information;
 - vii) soil salvage plans indicating salvage areas techniques, depths, types, quality and volumes of soils to be salvaged, length of time to be stored before use and planned use of the materials with reference to reclamation material balance. Discuss whether organic soil materials (LFH and/or peat) will be salvaged or removed. For organic soils also describe the expected decomposition and how this will be managed and how any volume changes will be accommodated in the reclamation plan;
 - viii) the storage and handling of soils and potential locations for soils stockpiles; and
 - ix) methods to deal with potential soil compaction and contamination;
- d) a detailed description of the reclamation topography for all development areas, identifying contouring objectives, drainage restoration (surface and near-surface flow) and erosion control;
- e) a detailed reforestation plan that is integrated with soil and topography plans, that specify the ecosites and productivity proposed for the establishment of predevelopment capabilities for traditional land use, wildlife, commercial forestry, watershed and recreation;
- f) possible mitigation options to reduce the potential impact from disturbance to key soil characteristics, re-vegetation practices, surface and groundwater properties; and
- g) references to demonstrated success with respect to proposed reclamation techniques, where applicable.