

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

FOR THE PROPOSED

**DYNEA CANADA LTD.'S
SEXSMITH FORMALDEHYDE PROJECT**

Town of Sexsmith

ISSUED BY: Alberta Environment

DATE: July 19, 2006

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to identify for Dynea Canada Ltd. (Dynea) and appropriate stakeholders the information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) and Regulations. Dynea will prepare and submit an EIA report that examines the environmental and socio-economic effects of the construction, operation and reclamation of its proposed formaldehyde manufacturing facility (the “Project” or “facility”).

Dynea is proposing to build the Project on an existing industrial site in Sexsmith, Alberta. The facility will produce up to 60,000 tonnes (100%) of formaldehyde per year. This Project is the third phase of a three-phase development plan:

Phase 1 – involving chemical storage and reload;
Phase 2 – resin manufacturing; and
Phase 3 – formaldehyde resin feedstock manufacturing.

Phase 1 requires municipal government approval; Phase 2 requires an industrial approval under EPEA; and Phase 3 requires an EIA followed by amendment of the industrial approval issued for Phase 2.

The existing industrial site in Sexsmith chosen for the Project is occupied by an abandoned canola oilseed extraction plant. Dynea acquired the site, which is more than 50 acres of land, from the Town of Sexsmith in 2003. Combined, all three phases of the development plan will occupy 20 acres or less than 40% of the total site and this portion includes a suitable buffer zone. The remaining 30 acres or 60% of the site will be re-developed for general industrial zoning by local interests or will be left as greenbelt. The proposed formaldehyde plant will occupy less than 5% of the Dynea site development.

Pending regulatory approval, it is Dynea’s intention to begin construction of the facility in 2007.

1.2 Scope Of Environmental Impact Assessment Report

The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under the EPEA and Regulations. Federal regulators have indicated that they are not interested in participating in the provincial review process,

although Health Canada and Environment Canada wish to stay informed about the Project.

The EIA report will:

- a) Assist the public and government in understanding the environmental and socio-economic consequences of the Project, operation and reclamation plans and will assist Dynea in its decision-making process;
- b) Address:
 - i. Project impacts,
 - ii. mitigation options, and
 - iii. residual effects relevant to the assessment of the project including, as appropriate, those related to other industrial operations;
- c) Discuss possible measures, including established measures and possible improvements based on research and development to:
 - i. prevent or mitigate impacts;
 - ii. assist in the monitoring of environmental protection measures; and
 - iii. identify residual environmental impacts and their significance including cumulative and regional development considerations. As appropriate for the various types of impacts, discussion of impact predictions should be presented in terms of magnitude, frequency, duration, seasonal timing, reversibility, and geographic extent;
- d) Include tables that cross-reference the report (subsections) to the EIA Terms of Reference;
- e) Include a glossary of terms and a list of abbreviations to assist the reader in understanding the material presented.

The EIA report will form part of Dynea's application to Alberta Environment and the *Alberta Natural Resources Conservation Board* (NRCB). A summary of the EIA report will also be included as part of the NRCB Application.

1.3 Public Consultation

The Project will include a public consultation program that will facilitate communication with members of the public and industry who may be affected, directly or indirectly, by the Project and will provide them with an opportunity to participate in the Environmental Assessment process. The EIA report will document the results of the public consultation program (see Section 9.0) and will provide information to address the issues raised.

1.4 Proponent's Submission

Dynea is responsible for the preparation of the EIA report and related applications. The EIA report will be based upon these Terms of Reference and issues raised during the public consultation process.

2. PROJECT OVERVIEW

Provide an overview of the Project, clearly outlining:

- a) The name of the proponent
- b) Project need and alternatives
- c) Regulatory planning and framework
- d) Key environmental and socio-economic issues important for a public interest decision (EIA Summary)
- e) A corporate profile of the proponent including ownership structure,
- f) The name of the legal entity that will develop, manage and operate the Project;
- g) A corporate history in the formaldehyde production industry, with specific reference to the existing Dynea developments and proposed developments in the Grande Prairie region

2.1 Project Need And Alternatives

Discuss the need for the Project and Alternatives considered and::

- a) Discuss the implications resulting from a delay in proceeding with the Project, or any phase of the Project;
- b) Identify and compare any alternative technologies, operational practices, mitigation, and management options for the Project and indicate their potential environmental effects and impacts; and
- c) Identify potential cooperative development opportunities for the Project (e.g., shared infrastructure) and the implications of the Project for ongoing regional management and research initiatives.

2.2 Regulatory And Planning Framework

The EIA report will:

- a) Identify the federal, provincial and municipal legislation, policies, approvals and current multi-stakeholder planning initiatives applicable to the review of this Project;
- b) List the major components of the Project that will be applied for and constructed under the EPEA and *Water Act* (WA);
- c) Address other regulatory authorizations or systems that exist or will be required for the Project under provincial, municipal and federal government requirements, and describe the schedule and mechanisms Dynea will engage to comply with these regulatory processes;

- d) Discuss the primary focus of each regulatory requirement, such as environmental protection, land use development and the elements of the Project that are subject to that regulation;
- e) Provide a summary of the regional, provincial or national objectives, standards or guidelines that have been used in the classification and evaluation of the significance of effects.

2.3 EIA Summary

Provide a summary of the EIA report, including:

- a) The Project components and development activities which have the potential to affect the environment;
- b) Existing conditions in the Study Area, including existing uses of lands, resources and other activities which have potential in combination with the Project, to affect the environment;
- c) The environmental effects anticipated;
- d) The key environmental and socio-economic issues that are important for a public interest decision
- e) Proposed environmental protection plans, monitoring and mitigation measures; and
- f) Residual effects of the Project.

List and discuss key environmental issues and issues which are important for the achievement of sustainable environmental and resource management that were identified during the preparation of the EIA report and public consultation. Differentiate between emerging issues (with ongoing uncertainties), issues with quantifiable and significant environmental effects, and issues that can be resolved through available technology and existing management practices. A matrix or chart will be used to describe this section.

3. PROJECT DESCRIPTION AND MANAGEMENT PLANS

The EIA report will:

- a) Describe activities and components of the Project and relevant management plans.
- b) Provide sufficient scope and detail in the project description information to allow quantitative assessment of the environmental consequences. If the scope of information varies among components of the Project, provide rationale demonstrating that the information is sufficient for assessment purposes.
- c) Describe the project components, infrastructure and activities. Discuss the alternatives considered, the alternative selection process, the potential effects that activities and infrastructures may have on the environment.

- d) Outline the management plans to minimize the discharge of pollutants, manage wastes, reclaim disturbed lands and water-bodies, manage and monitor environmental effects.
- e) Describe all of the activities and components of the Project that are proposed for approval.
- f) Provide outlines of the relevant management plans for these activities.

3.1 Project Components And Development Schedule

The EIA report will describe the nature, size, location and duration of the components of the Project including, but not limited to the following:

- a) The phases of development;
- b) Design capacities of the Project;
- c) Field maintenance operations;
- d) Provide a map showing any existing infrastructure (e.g. roads) and the location of the proposed central and field facilities;
- e) Location of the buildings, road access, pipeline routes, water source wells/intakes, water pipelines, water storage structures, and utility corridors associated with the Project;
- f) Transportation infrastructure and access routes;
- g) Utility corridors;
- h) Temporary structures;
- i) Processing/treatment facilities;
- j) Containment structures such as berms and retention ponds;
- k) Water source wells and intakes;
- l) Aggregate resources and other road construction material required and on-site availability;
- m) Types and amounts of waste materials, waste storage area and disposal sites;
- n) Activities associated with development of the area, operations, reclamation and development; and
- o) Proposed method of product transportation to markets.

The EIA report will provide a development schedule outlining the proposed phasing, sequencing and duration of components, including:

- a) Pre-construction;
- b) Construction;
- c) Operation;
- d) Decommissioning;
- e) Reclamation;
- f) Key factors controlling the schedule and uncertainties.

3.2 Site Selection

Discuss the site selection process including, but not limited to, the following:

- a) Factors that were considered in determining the preferred plant site and associated processing facilities;
- b) The site selection process for the proposed location of project components;
- c) The rationale for choosing the proposed sites instead of alternative sites;
- d) The technical, geotechnical, economical, and environmental criteria considered;
- e) Potential impacts on environmental and land use conditions, and on residents and public places; and
- f) Suitable maps showing the location of proposed project facilities.

3.3 Process Selection And Description

The EIA report will provide the following:

- a) Flow diagrams and descriptions of the processes to be used;
- b) Alternative technologies considered;
- c) Shared utilities and facilities;
- d) Chemicals needed for the production process, including Material Safety Data Sheets where available;
- e) Rationale for selection of the technologies chosen;
- f) 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; and
- g) The energy and process efficiency of the technologies chosen, including greenhouse gas emissions.

3.4 Materials Storage

The EIA report will:

- a) Identify the location and amount of on-site storage of chemicals, products, by-products, intermediates and associated wastes.
- b) Explain containment and environmental protection measures with reference to relevant provincial and federal guidelines.
- c) Discuss contingency plans for spill response and any environmental risks associated with product releases or management practices.

3.5 Utilities And Transportation

Describe the project energy requirements, associated infrastructure and other infrastructure requirements, including the following:

- a) The steps taken to integrate the needs of other resource users into the location and design of access infrastructure;
- b) Risks associated with truck and rail transportation of chemical feedstock and products of the Project;
- c) Reducing or mitigating visual impact during construction and operation of infrastructure;
- d) How public access will be managed during the development phase of the Project;
- e) The impact of increased vehicle traffic on highway and roads in the area, considering other existing and planned industrial, commercial and residential developments and operations in the region;
- f) Consultations with the local transportation authorities;
- g) Road access to and within the Project Area and identify needs to upgrade existing roads or construct new roads;
- h) Impact of any site light or airborne emissions, including water vapour, on highway traffic;
- i) Drainage from the site to roadside ditches and any capacity upgrades required to existing infrastructure;
- j) Identify the potential energy source, electrical power transmission and access routes to the Project; and

3.6 Water Supply, Water Management And Wastewater Management

3.6.1 Water Supply

The EIA report will provide the following information for the Project:

- a) Water balance;
- b) Process, potable and non-potable water requirements for construction, start-up, normal and emergency operating situations, decommissioning and reclamation;
- c) How these requirements will be met considering current demands and also expected regional development (both residential and commercial/industrial);
- d) The location of sources/intakes and associated infrastructure (e.g., pipelines for water supply);
- e) Measures for ensuring efficient use of water, including alternatives to reduce freshwater consumption such as water minimization, use of brackish water, recycling and other conservation techniques; and
- f) The impact of low flow conditions and instream flow needs (IFN) on water and wastewater management strategies including contingency plans for water sourcing or

management alternatives to manage potential low flow withdrawal restrictions.

3.6.2 Water Management

The EIA report will provide a Water Management Plan for construction, operation and reclamation phases, including the following:

- a) Site runoff and containment, erosion control and groundwater protection;
- b) Factors used in the design of water management facilities, including expected flood levels and flood protection; and
- c) Permanent or temporary alterations or realignments to waterbodies and wetlands.

3.6.3 Wastewater Management

The EIA report will provide a Wastewater Management Plan to address site runoff, groundwater protection, wastewater disposal and/or discharge, including the following:

- a) The source, quantity and composition of wastewater streams from the proposed operations for all project conditions, including normal, start-up, worst case and upset conditions;
- b) Any National Pollutant Release Inventory (NPRI) substances relevant to the Project;
- c) The design of facilities that will handle, treat and store wastewater streams and the type and quantity of any chemicals used in wastewater treatment, including measures taken in the design to prevent potential impacts to the environment;
- d) The options for wastewater treatment, disposal and/or discharge, including the rationale for selecting the preferred options;
- e) The quantity, quality and timing of any proposed wastewater releases and their potential environmental effects;
- f) How produced water generation will be managed and how make-up water requirements and disposal volumes will be minimized;
- g) The potable water and sewage treatment systems for both the construction and operation stages.

3.7 Air Emissions Management

The EIA report will:

- a) Develop an emissions profile (type, rate and source) for each component of the Project including point sources and fugitive emissions.
- b) Consider both normal operating conditions and upset conditions.

Discuss the following:

- a) Any NPRI substances relevant to the Project;
- b) Point of impingement (POI) concentrations for all emissions;
- c) Any odorous or visual emissions from the proposed facilities;
- d) The amount and nature of any acidifying emission, probable deposition patterns and rates and programs Dynea may implement to monitor the effects of this deposition;
- e) Control technologies used to minimize air emissions such as formaldehyde (H₂CO), oxides of nitrogen (NO_x), volatile organic compounds (VOC), and particulate matter;
- f) Gas collection, conservation and applicability of technology for vapour recovery for the Project;
- g) Fugitive emissions control program to detect, measure and control emissions and odours from equipment leaks and the applicability of the *CCME Code of Practice for Measurement and Control of Fugitive VOC Emissions from Equipment Leaks* and the *CCME Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Above Ground Storage Tanks*;
- h) Monitoring programs Dynea will implement to assess air quality and the effectiveness of mitigation, during the Project's development and operation. Discuss how these monitoring programs are compatible with those in use by regional multi-stakeholder air initiatives;
- i) The expected annual and total greenhouse gas (GHG) emissions over the construction, operation and decommissioning phases of the Project; and
- j) The Project's marginal contribution to total provincial and national GHG emissions on an annual basis.

3.8 Waste Management

The EIA report will:

- a) Characterize and estimate the wastes generated or used by the Project,
- b) Demonstrate that the selected management options are consistent with the current regulatory requirements and best industry practices,

- c) Develop plans for waste minimization and recycling over the life of the project, and

Address the following:

- a) A classification of the wastes generated and a characterization of each stream under the EPEA *Waste Management Regulations* and Alberta Environment's *Hazardous Waste Storage Guidelines*.
- b) Provide a listing of chemical products to be used by the Project. Identify products containing substances that are *Canadian Environmental Protection Act* (CEPA) toxic chemicals, on the Priority Substances List (PSL 2), on the National Pollutant Release Inventory (NPRI), or Track 1 substances targeted under Environment Canada's Toxic Substances Management Policy.
- c) Describe, in general terms, how these items will be stored and managed to ensure safety and environmental protection. Identify how future changes to this slate of chemical products will be handled to ensure adequate protection to both the environment and to employee health and safety.
- d) Identify the location, nature and amount of on-site formaldehyde and feedstock chemical storage.
- e) Containment and other environmental protection measures.
- f) How selected practices comply with the provincial and federal regulations.
- g) The strategy for on-site waste disposal versus off-site waste disposal and an analysis of environmental implications of proposed options. Identify the location of on-site waste disposal locations, including industrial landfills. Identify on- and off-site waste treatment areas.

3.9 Environmental Management Systems And Contingency Plans

The EIA report will:

- a) Summarize key elements of Dynea's environment, health and safety 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 and monitoring 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;

- d) The procedures specified in the emergency response plan to deal with potential negative impacts and public communication procedures;
- e) Quality assurance and quality control (QA-QC) programs Dynea 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 Dynea 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;
- g) Involvement in regional cooperative efforts to address environmental and socioeconomic issues associated with the Project; and
- h) A fire control plan.

3.10 Adaptation Planning

The EIA report will describe the flexibility built into the plant design and layout to accommodate future modifications required by any change in emission standards, limits and guidelines. Encroachment of development on the Project site and mitigative measures will be discussed.

3.11 Reclamation And Closure

The EIA report will provide a conceptual reclamation and closure plan for the Project with consideration to the following:

- a) Reclamation requirements specified by relevant regulatory organizations and stakeholder preferences;
- b) Anticipated timeframes for completion of reclamation;
- c) Post-development land capability, having regard for regulatory requirements, need to return to equivalent land use capability, and stakeholder end land use preferences;
- d) Integration of operations, reclamation planning and reclamation activities; and
- e) Financial obligations and contingencies to ensure proper reclamation and closure of the site, including in the event of Dynea corporate insolvency.

4. ENVIRONMENTAL ASSESSMENT

The EIA report will define assessment scenarios including:

- a) A baseline case, which includes existing environmental conditions and existing and approved projects or activities;
- b) An Application Case, which includes the Baseline Case plus the Project; and
- c) A Cumulative Effects Assessment (CEA) Case, which includes past studies, existing and anticipated future environmental conditions, existing projects or activities, plus other or 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 during the time period ending six months prior to the submission of the Project Application and EIA Report.

4.1 Assessment Requirements

The EIA report will include the following basic environmental information requirements for the Project:

- a) Discussion of the reliability of data, including synthetic data, used in the EIA, including any modelling exercises. Include a discussion on the potential range of model results based on variability of the data used. Describe plans for ongoing model parameter updates and model validation;
- b) Information about the human activities in the Study Area and the nature, size, location and duration of their potential interactions with the environment; (e.g., 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) The demonstrated use of appropriate predictive tools and methods, consistent with industry best practices to enable quantitative estimates of future conditions with the highest possible degree of certainty;
- d) Definition of the system employed to classify and evaluate the effects associated with the Project. The classification system will include qualitative and quantitative descriptions of the effects, having regard for direction, magnitude, geographic extent, duration, reversibility and frequency (CEAA Responsible Authority’s Guide). The evaluation system will rank the consequences of the effects measured quantitatively against management objectives or baseline conditions, and described qualitatively with respect to the views of the proponent and stakeholders;
- e) Management plans to prevent, minimize or mitigate adverse effects and to monitor and respond to expected or unanticipated

conditions, including any follow-up plans to verify the accuracy of predictions or determine the effectiveness of mitigation plans.

Provide a record of all assumptions, confidence in data to support conclusions regarding reclamation and mitigation success;

- f) Identify assumptions behind statistical tests used in the EIA report and show that the data meets statistical requirements (e.g., normality, independence, etc.);

4.2 Study Area

The EIA report will define and provide the rationale for the spatial and temporal boundaries for the Study Area used for the assessment. The spatial boundaries shall include the area where measurable changes in the environment may be caused by the Project regardless of any political boundaries. The boundaries should take into consideration relevant regional initiatives such as the *Peace Airshed Zone Association (PASZA)*.

The EIA report will provide:

- a) The legal land description;
- b) The boundaries of the Study Area;
- c) A map that identifies the locations of all proposed development activities;
- d) A map showing the area of development in relation to existing topographic features, township grids, wetlands and water bodies.

4.3 Cumulative Environmental Effects Assessment (Cea)

The EIA report will:

- a) Assess and discuss the cumulative environmental effects that are likely to result from the Project in combination with other existing, approved and planned projects in the region that could reasonably be considered to have a combined effect. Include industrial projects, as well as activities associated with land use and infrastructure.
- b) Explain the approach and methods used to identify and assess cumulative impacts, including cooperative opportunities and initiatives undertaken to further the collective understanding of cumulative impacts.
- c) Provide a record of all assumptions, confidence in data and analysis to support conclusions.
- d) Describe deficiencies or limitations in the existing database on environmental components and propose measures to deal with resultant uncertainties.
- e) Address the adequacy of the Study Area, information sources and assessment methods for a cumulative effects assessment;

Dynea will conduct a cumulative environmental effects assessment of the Project in accordance with the EUB/AENV/NRCB Information Letter "Cumulative Effects Assessment in Environmental Impact Assessment Reports under the *Alberta Environmental Protection and Enhancement Act*," June 2000.

4.4 Climate And Air Emissions

The EIA report will:

- a) Discuss climatic and air quality conditions considering existing and approved emission sources (Baseline Case) alone and in combination with the Project's proposed emissions (Application Case) and for the Cumulative Effects Assessment scenario.
- b) Consider emission point sources as well as fugitive emissions.
- c) Identify components of the Project that will affect air quality from local and regional perspectives, and

Discuss the following:

- a) The selection criteria used to determine the Study Area, including information sources and assessment methods;
- b) Baseline climatic conditions and impact to modeling;
- c) Discuss appropriate air quality parameters such as formaldehyde, phenol, CO, CO₂, NO_x, VOC, methanol, methyl formate, formic acid, urea, particulates (road dust, PM10 and PM2.5), and opacity (water vapour);
- d) Estimate ground-level concentrations of appropriate air quality parameters. Justify the selection of the models used and identify any model shortcomings or constraints on findings. Complete modeling in accordance with Alberta Environment's *Air Quality Modeling Guidelines* and AAQO;
- e) Discuss the meteorological data model input set used to run the model and provide rationale for the choice of the data set;
- f) Predicted air quality concentrations compared with the appropriate air quality guidelines available (including the *Alberta Ambient Air Quality Objectives (AAQO)*), their implications and any mitigative measures optional or necessary;
- g) Any implications of the expected air quality for environmental protection and public health;
- h) Monitoring that will be conducted;
- i) Identify any regional air monitoring underway in the area and describe Dynea's participation in any regional forums (PASZA);
- j) Identify components of the Project that will affect noise levels;
- k) Identify components of the Project that have the potential for creating increased noise levels and discuss the implications and measures to mitigate; and

- l) Identify site light or airborne emissions sources, including water vapour, and evaluate the potential effects on affected residents and on highway traffic.

4.5 Land Use

The EIA report will identify the existing land use in the Study Area and discuss the following:

- a) Any anticipated impacts related to changes in public access;
- b) Any land use policies and resource management initiatives that pertain to the Study Area and discuss how the proposed development will be consistent with the intent of the guidelines and objectives of these initiatives;
- c) The implications of those land and resource use policies for the Project, including any constraints to development;
- d) Unique sites or special features in the Study Area such as Natural Areas, Environmentally Significant Areas, and any potential impacts of the Project on these features;
- e) The process for addressing the needs of other users in the Local Study Area;
- f) Implications of the Project individually and in combination (cumulative) with other (existing and planned) developments for regional recreational activities, public access and other land uses during and after development activities, including:
 - i. how regional environmental management initiatives will be incorporated into Dynea's land use plan;
 - ii. impact on residential areas, agricultural development, areas with native vegetation, wildlife habitat, and recreational uses; and
 - iii. measures to mitigate impacts created on land use by the Project. Identify anticipated impacts on public access for land use in the region.

4.6 Terrestrial Ecosystems

The EIA report will:

- a) Describe ecosystem characteristics in the Study Area.
- b) Explain the significance of any anticipated environmental changes for ecosystem integrity.
- c) Include the sustainability of biodiversity, critical wildlife sites and fisheries habitat, wildlife corridors, habitat quality, and productivity and potential changes to fish and wildlife populations.
- d) Discuss the existing use of plants and animals in traditional lifestyles, recreational pursuits and industrial activities and, if appropriate, provide the locations of these sites.

4.6.1 Biodiversity

The EIA report will:

- a) Using the definition for biodiversity provided in the Canadian Biodiversity Strategy (1995), determine the suite of target elements that will be used to assess biodiversity in terrestrial and aquatic ecosystems, that will be used to characterize the existing ecosystems and that will be used to represent broad taxonomic assemblages;
- b) Discuss the selection process and rationale used to select biotic and abiotic biodiversity indicators; and
- c) Discuss the contribution of the Project to any anticipated changes in regional biodiversity including measures to minimize such change and the potential impact to local and regional ecosystems.

4.6.2 Geology, Terrain and Soils

The EIA report will provide the geological, terrain and soils conditions for the Study Area, including the following:

- a) Maps indicating the pre-disturbance landscape, elevation and drainage patterns of the Study Area;
- b) Explain the significance of any changes for the regional landscape, biodiversity, productivity, ecological integrity, aesthetics and the future use of the regional landscape area;
- c) Surficial geology including surface topography of the Study Area and the bedrock; and
- d) An inventory of the soils conditions in the Local Study Area and describe the impacts due to the Project.

4.6.3 Vegetation

The EIA report will provide the following:

- a) Discuss any potential effects the Project may have on rare plants or endangered species, as listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Alberta Natural Heritage Information Centre (ANHIC), for each landscape unit;
- b) Discuss the eco-sites in consideration of their potential to support rare plant species, plants for traditional and medicinal purposes, and communities of limited distribution. Consider their importance for local and regional habitat, sustained forest growth, rare plant habitat and the hydrologic regime;
- c) Identify the amount of vegetation and wetlands to be disturbed during each stage of the Project;

- d) Discuss temporary (include timeframe) and permanent changes to vegetation and wetland communities;
- e) Provide a detailed mitigation strategy that will minimize project impacts in the Study Area; and
- f) Develop a plan to mitigate the adverse effects of site clearing on rare plants and plant communities. Identify any setbacks proposed around environmentally sensitive areas such as surface waterbodies, riparian areas and peatlands/wetlands.

4.6.4 Wildlife

The EIA report will:

Describe existing wildlife resources (amphibians, reptiles, birds and terrestrial and aquatic mammals), their use and potential use of habitats in the Study Area. Document the anticipated changes to wildlife in the Study Area. Specifically:

- a) Discuss the selection criteria used to determine the Study Area, including information sources and assessment methods;
- b) Identify key indicator species and provide the rationale and selection process. Identify composition, distribution, relative abundance, seasonal movements, movement corridors, habitat requirements, key habitat areas, and general life history in the Study Area. Address those species listed by Alberta Fish and Wildlife (at risk, may be at risk and sensitive species in the *General Status of Alberta Wild Species 2000*) and COSEWIC (endangered, threatened, vulnerable in *Canadian Species at Risk 2002*);
- c) Evaluate potential impacts on wildlife populations, habitat use, habitat availability/quality and food supply during all phases of the Project. Consider habitat loss, abandonment, reduced effectiveness, fragmentation or alteration as it relates to reproductive potential and recruitment for regional wildlife populations over the life of the Project. If habitat models are used to evaluate impacts, the models will be modified/calibrated by comparing model predictions with wildlife data from the Study Area;
- d) Anticipated effects on wildlife as a result of changes to air, water, including both acute and chronic effects on animal health;
- e) An impact assessment for wildlife in the Study Area. Identify residual impacts to wildlife and wildlife habitat and discuss their significance in local and regional contexts, and

- f) The potential to return the area to pre-disturbed wildlife habitat/population conditions.

4.7 Water Resources

4.7.1 Groundwater

The EIA report will:

- a) Provide an overview of the existing geologic and hydro geologic setting in the Project and Study Area.
- b) Document any new hydrogeological investigations, including methodology and results, undertaken as part of the EIA study.
- c) If figures, maps, diagrams, interpretations and concepts developed from previous work are submitted in the EIA report, demonstrate how, or if, they have been modified by the incorporation of any subsequent new data.
- d) Identify water well development and groundwater use, including an inventory of all groundwater users, (field verify domestic and agricultural wells in the principle development area);
- e) Include Justification of hydrogeological models used for the assessment;
- f) Identify the potential for changes in the groundwater regime as a result of the Project;
- g) Include a conceptual plan and implementation program for the protection of groundwater resources including the early detection of potential contamination and remediation planning;
- h) Describe the nature and significance of the potential project effects/impacts on groundwater with respect to:
 - i. inter-relationship between groundwater and surface water in terms of surface water quantity and quality;
 - ii. implications on terrestrial or riparian vegetation, wildlife and aquatic resources including wetlands;
 - iii. changes in groundwater quality;
 - iv. conflicts with other groundwater users, and proposed resolutions to these conflicts; and
 - v. potential implications of seasonal variations.

4.7.2 Surface Water

The EIA report will:

- a) Discuss baseline surface hydrology immediately downstream/downhill of the Project, including:
 - i. Project activities that may affect surface water during all stages of the Project;
 - ii. Available local and regional surface flow baseline data, including seasonal variation, low, average and peak flows for key creeks, river locations, and low, average and peak levels for key lakes. Describe and map the drainage patterns in the Study Area;
- b) Identify any potential changes that will result from disturbances to surface water movement:
 - i. include changes to the quantity of surface flow, water levels and channel regime in local watercourses (during minimum, average and peak flows) and water levels in local waterbodies and wetlands;
 - ii. assess the potential impact of any alterations in flow on the local and regional hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals, and their magnitude, duration, frequency, and proposed mitigation measures (justify why the changes are required);
 - iii. discuss both the Project and cumulative effect of these changes on hydrology (e.g., timing, volume, peak and minimum flow rates, river regime and lake levels), including the significance of effects for downstream watercourses;
- c) Describe the proposed mitigation measures to be considered, during the construction, operation and reclamation phases of the Project, to maintain surface water quality.

5. ENVIRONMENTAL MONITORING

The EIA report will:

- a) Describe monitoring activities that Dynea will undertake to verify and manage environmental impacts, 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 Dynea 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 Dynea is proposing to conduct collaboratively with other stakeholders. Include the role that Dynea anticipates taking in each of the programs, including PASZA;
 - c) mechanisms for sharing results, reviewing findings and adjusting programs should monitoring identify unanticipated consequences of Dynea's operations or mitigation plans, including:
 - i. corporate adaptive management strategies;
 - ii. steps that Dynea will take to involve regulators and public stakeholders;
 - iii. steps to communicate unanticipated conditions to regulators and regional management forums if regional environmental conditions may be affected.

6. PUBLIC HEALTH AND SAFETY

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

- a) Identify and discuss the data and methods used by Dynea to assess the 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, including exposure to children and/or sensitized human receptors;
- c) Identify the human health impact of the potential contamination of country foods and natural food sources taking into consideration all project activities;
- d) 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;
- e) Discuss the cumulative health effects that are likely to result from the Project in combination with other existing, approved, and proposed projects (projects that have been advanced to the public disclosure stage) or reasonably-foreseeable activities in the region;
- f) Provide information on samples of selected species of vegetation known to be consumed by humans;
- g) 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;
- h) Provide a summary of Dynea'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;
- i) Describe how local residents will be contacted during an emergency and what type of information will be communicated to them;
 - j) Describe existing agreements with area municipalities or industry groups such as, safety co-operatives, emergency response associations and municipal emergency response agencies;
 - k) Identify and discuss potential health and safety impacts due to higher regional traffic volumes and the increased risk of accidental leaks and spills;
 - l) Document health and safety concerns raised by stakeholders during consultation on the Project; and
 - m) Describe the mitigation strategies that will be utilized to ensure public safety with respect to water vapour emissions.

7. HISTORICAL RESOURCES AND TRADITIONAL LAND USE

The EIA report will provide consultation with Alberta Community Development and Aboriginal communities, including:

- a) A general overview of the results of any previous historical resource studies that have been conducted in the Study Area, including archaeological resources, paleontological resources, historical period sites, and any other historical resources as defined within the *Historical Resources Act*;
- b) Provide details of Dynea's consultation with Aboriginal groups to determine the effects on traditional use of the Local Study Area(s). Document any stakeholder concerns regarding the impact of the Project on the historical significance of the Study Area(s) and its current use by traditional users. Identify the existing and historical land users, including tourism, forestry, fishing, hunting, traditional plant harvesting, cultural use and outdoor recreation with specific regard given to the Aboriginal peoples. Determine the impact of development on these uses and identify possible mitigation strategies.

8. SOCIO-ECONOMIC FACTORS

The EIA report will provide information on the socio-economic effects of the Project, including:

- a) The number and distribution of people who may be affected by the Project;
- b) The socio-economic impacts of the Project on the Study Area, communities of the region and on Alberta including:
 - i. local employment and training;
 - ii. local procurement;
 - iii. population changes;
 - iv. demands on local services, infrastructure and community services;

- v. housing concerns in local communities, including impact on property values;
 - vi. trapping, hunting and fishing;
 - vii. effects on First Nations and Metis (e.g., traditional land use and culture);
 - viii. regional and provincial economic benefits.
- c) Dynea's policies and programs regarding the use of regional, Alberta and Canadian goods and services. Estimate industrial benefits including Alberta, other Canadian, and non-Canadian percentages of total project cost for engineering and project management, equipment and materials, construction labour and total overall project;
 - d) Describe and discuss the impacts of the proposed Project on potential shortages of affordable housing and the quality of health care services. Identify and discuss the mitigation plans that will be undertaken to address these issues. Provide a summary of any discussions that have taken place with the Municipality and the Regional Health Authority concerning potential housing shortages and health care services respectively;
 - e) The impact on local services and infrastructure, taking into consideration other projects that are reasonably anticipated during the life of the Project. This will include consideration of transportation, education/training, social services, urban and regional recreation use, law enforcement and emergency preparedness;
 - f) Strategies to mitigate socio-economic concerns raised by the Town of Sexsmith and other stakeholders in the region.

9. PUBLIC CONSULTATION REQUIREMENTS

Dynea will document the public consultation program implemented for the Project including:

- a) Methods and the type of information provided;
- b) Include a consultative process showing how public input was obtained and addressed;
- c) Record any concerns or suggestions made by the public and demonstrate how these concerns have been addressed;
- d) Documentation of participation at each meeting, advertisements in local publications and direct mailings;
- e) Plans to maintain the public consultation process following completion of the EIA review to ensure that the public will have an appropriate forum for expressing their views on the ongoing development, operation and reclamation of the Project;
- f) Consultation will include discussions with the following stakeholders:
 - i. residents;
 - ii. local First Nations and Metis organizations;
 - iii. federal, provincial and municipal government representatives;

- iv. commercial, industrial, recreational, environmental groups and individuals expressing formal interest in the project;
- v. other potentially affected parties.