Appendix A

Draft

PROJECT-SPECIFIC GUIDELINES

AND

COMPREHENSIVE STUDY SCOPING DOCUMENT

ENVIRONMENTAL IMPACT ASSESSMENT

OF THE

FORMER GUNNAR MINE SITE REHABILITATION PROJECT

SASKATCHEWAN RESEARCH COUNCIL

This document has been prepared to meet the requirements for Project-Specific Guidelines for the Saskatchewan environmental impact assessment process and for the federal Comprehensive Study Scoping Document as required by the *Canadian Environmental Assessment Act*. It was prepared by Saskatchewan Environment, the Canadian Nuclear Safety Commission, Natural Resources Canada and the Canadian Environmental Assessment Agency to assist the Saskatchewan Research Council with the environmental impact assessment of the proposed Former Gunnar Mine Site Rehabilitation Project.

This document is in draft form, and public comments are invited before it is made final.

To ensure consideration, written comments should be submitted by 2 May, 2008 to:

- Malcolm K. Ross, Environmental Assessment Branch, Saskatchewan Environment
  3211 Albert Street, REGINA, SK. S4S 5W6
  Phone: (306) 787-6190; Fax: (306) 787-0930; E-mail: malcolm.ross@gov.sk.ca

or

- Kristina Farmer, Canadian Environmental Assessment Agency
  123 Main Street, Suite 445, WINNIPEG, MB. R3C 4W2
  Phone: (204) 984-0427; Fax: (204) 983-1878; E-mail: kristina.farmer@ceaa-acee.gc.ca

Canada

Saskatchewan

1.0 INTRODUCTION

1.1 Site History

The Gunnar uranium mining and milling site (Gunnar site) on the north shore of Lake Athabasca (59°23' N, 108°53' W) in northern Saskatchewan ceased mining operations in 1963. The site, operated by the former Gunnar Mining Limited, had commenced uranium production in 1955. Uranium ore was mined initially from an open-pit and then from an underground operation. The Gunnar site officially closed in 1964 with little or no decommissioning of facilities. Shortly after closure, a trench was blasted between the open-pit and Lake Athabasca, allowing the open-pit and underground workings to flood. Later this trench was blocked by waste rock. Between 1971 and 1980 the warehouse building near the main dock was used as a fish processing facility.

In 2001, the Canadian Nuclear Safety Commission (CNSC) enforced a legislative requirement that required sites not previously licensed under the *Atomic Energy Control Act* to be licensed under the *Nuclear Safety and Control Act*. These sites included tailings management areas resulting from the former operation of uranium mines. Under the NSCA, the Gunnar site was considered to be abandoned and under the care and control of the Province of Saskatchewan. As a consequence, the province was requested by the CNSC to submit an application to the CNSC to license the Gunnar site.

In 2006, Saskatchewan Environment (SE) took out a Miscellaneous Use Permit on the Gunnar site. The intent of this permit was to record the area in the SE Lands Branch records system so that no other SE land dispositions would be issued for the area.

In 2007, the Governments of Saskatchewan and Canada signed a Memorandum of Agreement to address the current environmental conditions of the abandoned uranium mine sites in northern Saskatchewan, including the rehabilitation of the Gunnar site. Under the Agreement, Saskatchewan Industry and Resources (SIR) is responsible for the Gunnar Mine Site Rehabilitation Project. SIR has retained the Saskatchewan Research Council (SRC) under contract to act as project manager and designated agent to manage and perform the required environmental impact assessment and rehabilitation activities. For the purpose of this document, SRC will be recognized as the "proponent" from this point forward.

1.2 Project Proposal

In April 2007, the proponent submitted a project proposal to SE and the CNSC describing the development and implementation of a plan to rehabilitate the Gunnar site.

The project as proposed by SRC includes the following components:

- Demolition of existing building, facilities and structures;
- Appropriate disposal of materials resulting from demolition;
- Installation of an appropriate cover on all or a portion of the exposed mill tailings;
- Rehabilitation of existing waste rock piles;
- Rehabilitation of additional risk(s) as warranted;
- General site clean-up;
- Re-vegetation of areas of the rehabilitated site as required; and
- Appropriate monitoring during and after rehabilitation.

The proponent has been informed that the proposed rehabilitation of the Gunnar site will require environmental assessment under Saskatchewan's *The Environmental Assessment Act* (provincial Act) and the *Canadian Environmental Assessment Act* (federal Act). The proponent is required to conduct an environmental impact assessment (EIA) and prepare an environmental impact statement (EIS) for technical and public review. This document has been prepared to assist the proponent with the conduct of the EIA and the preparation of the EIS.

1.3 Purpose of the Draft Project-Specific Guidelines and Scoping Document

This Draft Project-Specific Guidelines and Scoping Document (hereafter called the Guideline-Scoping Document) comprises the requirements of both the provincial Project-Specific Guidelines and the federal Comprehensive Study Scoping Document. Under the 2005 *Canada-Saskatchewan Agreement on Environmental Assessment Cooperation* (Cooperative Agreement), Canada and Saskatchewan can agree to produce a single document to outline the specific process and information requirements for both the federal and provincial environmental assessment processes.

The Guideline-Scoping Document has been prepared to assist SRC with the conduct of the EIA and the preparation of the EIS. The document reflects concerns and issues that have been raised by provincial and federal officials regarding the proposed project and identifies the information that should be included in the EIS.

The document is being made available to the public for their review. The public is requested to provide input into the draft guidelines and outline any additional issues of

interest that should be included in the EIS. In accordance with subsection 21(1) of the federal Act, the public is also asked to comment on the proposed scope of the project for the purposes of the environmental assessment (subsection 3.1) , the factors proposed to be considered in this assessment (subsection 3.2.1), the proposed scope of those factors (subsection 3.2.2), public concerns in relation to the proposed project including the potential for the project to cause adverse environmental effects, and the ability of a comprehensive study to address issues relating to the project.

Details on how the public can submit comments are provided in Section 5 of this document.

2.0 ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Federal and Provincial Cooperation in the Environmental Assessment

Canada and Saskatchewan intend to cooperate throughout the process in a manner that meets the legislated environmental assessment requirements of both parties. Under the Cooperative Agreement, federal and provincial environmental assessment processes, directed respectively by the federal *Canadian Environmental Assessment Act* (federal Act) and the provincial *Environmental Assessment Act* (provincial Act), are coordinated for projects with federal and provincial jurisdiction, where not limited by individual statutory or process requirements of the respective processes. Accordingly, information requirements of both federal and provincial agencies have been included in the Guideline-Scoping Document so that the EIS will be sufficient to address the requirements of the environmental assessment processes of both the Government of Saskatchewan and the Government of Canada.

Under the Cooperative Agreement, the Province of Saskatchewan, Environmental Assessment Branch, is the Lead Party and contact for the Gunnar Mine Site Rehabilitation Project, and has established a Project Administration Team for the cooperative environmental assessment. Membership on the Project Administration Team includes representatives from SE's Environmental Assessment Branch, the Canadian Nuclear Safety Commission (CNSC), Natural Resources Canada (NRCan), and the Canadian Environmental Assessment Agency (Agency).

As per the Cooperative Agreement, the Project Administration Team has worked together to consolidate the information requirements of both parties in this document. Members of the Project Administration Team will also be responsible for coordinating required decisions during the administration of the cooperative environmental assessment. Under the cooperative arrangement, a single environmental assessment and review process is used to obtain the environmental assessment information needed for federal and provincial environmental processes. Both governments will use the information generated through the cooperative environmental assessment as the basis for their

respective decisions about the project. However, each government will retain its ability to make project-related decisions on matters within its own legislative authority.

Pursuant to section 17(1) of the federal Act and section 9(1) of the provincial Act, the responsible authorities delegate the conduct of the environmental assessment to the Proponent. The Proponent will prepare an EIS based on this Guideline-Scoping Document. Once completed, the proponent will submit the EIS to the Project Administration Team for review.

2.2 Provincial Environmental Impact Assessment

Following technical review of the April 2007 SRC proposal for the rehabilitation of the Gunnar site by provincial agencies and departments, the Gunnar Mine Site Rehabilitation Project is considered to be a "development" pursuant to section 2(d) of the provincial Act. As a consequence, SRC is required to conduct an EIA of the proposed Gunnar Mine Site Rehabilitation Project and prepare and submit an EIS to the provincial Minister of Environment (provincial Minister).

Once the EIS is submitted, the Environmental Assessment Branch will circulate the EIS to provincial departments and agencies for technical review. These departments and agencies include the Saskatchewan Departments of Environment, Watershed Authority, Health, First Nations and Métis Relations, Culture Youth and Recreation (Heritage Branch), Industry and Resources, Northern Affairs, and Government Relations.

Following the technical review of the EIS, the Environmental Assessment Branch will prepare Technical Review Comments that evaluate the EIS. The EIS and the Technical Review Comments, along with the federal Comprehensive Study Report (discussed below), will then be provided to the public for a minimum 30 day review. After the public review of the EIS, the submissions from the public, together with information generated during the technical review of the EIS, will be provided to the provincial Minister for his consideration prior to making his Ministerial Decision whether or not to approve the development.

2.3 Federal Environmental Assessment

2.3.1 Regulatory Context

The proposed decommissioning of the Gunnar site is an undertaking in relation to a physical work, and thus is a '*project*' as defined in section 2 of the federal Act. The CNSC and NRCan have indicated that they may take steps that enable various aspects of the project to be implemented. As a result, they have determined that they are RAs under the federal Act. As such, they must ensure that an environmental assessment, as scoped

by them and in accordance with the federal Act, is conducted prior to the issuance of federal licences, authorizations, permits, approvals, and/or funding as described below.

2.3.1.1 Responsible Authorities

Canadian Nuclear Safety Commission (CNSC)

CNSC authorization of SRC's proposal would require the issuance of a license to decommission. Licences are issued by the Commission under the authority set out in subsection 24(2) of the *Nuclear Safety and Control Act* (NSCA). Subsection 24(2) of the NSCA is listed as a "trigger" under the *Law List Regulations* of the federal Act in respect of the issuance of a licence. Pursuant to paragraph 5(1)(d) of the federal Act, an environmental assessment must be conducted before a licensing decision can be made. CNSC is therefore an RA under the federal Act.

Natural Resources Canada (NRCan)

NRCan is participating as an RA under the federal Act for the environmental assessment of the Gunnar Mine Site Rehabilitation Project because it is considering providing funding for the decommissioning project. NRCan is also participating in the EA as a federal department with expertise relevant to the Project. This review will be coordinated through the Environmental Assessment Group of NRCan's Science, Policy and Integration sector.

2.3.1.2 Expert Federal Authorities

Pursuant to the *Federal Coordination Regulations* under the federal Act, the following federal departments/agencies have an interest in the project related to their mandate and are participating in the review as expert Federal Authorities (FAs) in relation to the project: Fisheries and Oceans Canada (DFO), Transport Canada (TC), Environment Canada (EC), and Health Canada (HC).

2.3.1.3 Federal Environmental Assessment Coordinator

The Canadian Environmental Assessment Agency (Agency) is the FEAC for the proposed project and is responsible for coordinating the review activities of the RAs and expert FAs in accordance with section 12 of the federal Act and in conjunction with the provincial environmental assessment process. The FEAC will coordinate the federal participation on the joint federal-provincial Project Administration Team, which will include the RA and FA departments identified above as well as the provincial Environmental Assessment Branch.

2.3.2 Type of Federal Environmental Assessment

CNSC and NRCan have determined that components of the proposed Gunnar Mine Site Rehabilitation Project are described in paragraph 19(a) of the *Comprehensive Study List Regulations* of the federal Act, as described below:

> *19. The proposed construction, decommissioning or abandonment, or an expansion that would result in an increase in production capacity of more than 35 per cent, of*
>
> *(a) a uranium mine, a uranium mill or a waste management system any of which is on a site that is not within the boundaries of an existing licensed uranium mine or mill;*

Although the project proposal is for 'site rehabilitation', the CNSC and NRCan consider the proposed activities to be activities related to decommissioning of a mine, mill and waste management systems. Subsection 19(a) of the *Comprehensive Study List Regulations* of the federal Act would therefore apply to this proposal.

2.3.3 Comprehensive Study Environmental Assessment Requirements

In accordance with subsection 21(1) of the federal Act, the RAs are required to consult with the public with respect to the proposed scope of the project for the purposes of the federal environmental assessment, the factors proposed to be considered, the proposed scope of those factors, and the ability of the comprehensive study to address issues relating to the project.

Following this initial public consultation associated with this document, as described in Section 5 and pursuant to subsection 21(2) of the federal Act, the RAs must submit a report to the federal Minister of the Environment (federal Minister), which will include the following:

- the scope of the project, the factors to be considered in the environmental assessment and the scope of those factors;
- public concerns in relation to the project;
- the project's potential to cause adverse environmental effects; and
- the ability of the comprehensive study to address issues relating to the project.

After taking into consideration comments from the public, the RAs must also recommend to the federal Minister whether the environmental assessment should be continued by means of a comprehensive study, or whether the project should be referred to a mediator or review panel. The recommendation document is referred to as the Track Report.

Once the Track Report is completed, the CNSC will hold a public hearing to provide the public an opportunity to review, comment and present interventions before the

Commission on the report prepared by the RAs. Following the public hearing, the Track Report will be submitted to the federal Minister to decide whether to refer the project back to the RAs to continue the comprehensive study process, or refer the project to a mediator or review panel. If the federal Minister decides that the project should continue as a comprehensive study, the project cannot be referred to a mediator or review panel at a later date.

If the federal Minister refers the project to a mediator or review panel, the project will no longer be subject to the comprehensive study process under the federal Act. The federal Minister, after consulting the RAs and other appropriate parties, will set the terms of reference for the review and appoint the mediator or review panel members. As per the Cooperative Agreement, the province will be immediately informed of this decision and will determine how the province would proceed. The public would have the opportunity to participate in the panel process.

If the environmental assessment continues as a comprehensive study, the RAs, following the review of the proponent's EIS and in consultation with SE, the Agency and the expert FAs, will conduct a comprehensive study and prepare a comprehensive study report (CSR). The CSR will be prepared based on the proponent's EIS and any additional information gathered throughout the assessment process. The RAs will ensure there are opportunities for public participation during the conduct of the comprehensive study. Once completed, the RAs will submit the CSR to the Agency.

Following submission of the CSR, the Agency will invite the public to comment on this report prior to the federal Minister taking a decision on the environmental assessment. Once the environmental assessment decision statement is issued, the federal Minister will refer the project back to the RAs for action.

A public registry for the project assessment has been established. This includes identification of the project assessment in the Canadian Environmental Assessment Registry (CEAR), which can be accessed on the Internet web site of the Agency (www.ceaa.gc.ca). The CEAR reference number for the project is 07-03-30100.

2.3.4 Funding to Participate in the Federal Environmental Assessment

Whether the environmental assessment proceeds by means of a comprehensive study or is referred to a mediator or review panel, participant funding will be made available by the Agency to facilitate public participation. This funding would become available after the federal Minister makes a Track Decision, i.e. to either refer the project back to the RAs to continue the comprehensive study process, or refer the project to a mediator or review panel. Information on the Participant Funding Program can be found on the Agency's website at http://www.ceaa-acee.gc.ca.

2.4 Joint Public Consultation

As is required in both federal and provincial environmental assessment processes, the public will be given an opportunity to participate in the conduct of the environmental assessment. The requirements for this participation are set out in Section 4.3 of this document.

If the environmental assessment continues as a comprehensive study, the public would also be provided with an opportunity to review the CSR prepared by the federal RAs. This review will be coordinated with the review of the proponent's EIS and the Technical Review Comments prepared by the provincial Environmental Assessment Branch. This final public review period must be a minimum of 30 days to meet provincial requirements and will be extended, if necessary, through consultation with the Project Administration Team as per the Cooperative Agreement.

The public will be requested to provide their comments on the EIS, Technical Review Comments and CSR to the Agency and/or SE. The federal and provincial ministers will take into account the CSR and Technical Review Comments, respectively, and any comments received from the public, prior to making environmental assessment decisions. The ministers may request additional information or require that public concerns be further addressed before issuing environmental assessment decisions.

3.0 PROPOSED SCOPE OF THE FEDERAL ENVIRONMENTAL ASSESSMENT

Scoping establishes the boundaries of the federal environmental assessment. The scope identifies what elements of the development proposal to consider and what environmental components are likely to be affected, and focuses the assessment on relevant issues and concerns.

3.1 Proposed Scope of Project

Pursuant to section 15 of the federal Act, the proposed scope of the project for the purpose of the federal environmental assessment, as established by the CNSC and NRCan, includes the physical works and activities associated with the decommissioning of the Gunnar site. The scope of the project includes:

- Demolition of existing buildings, facilities and structures;
- Appropriate disposal of materials resulting from demolition and remediation activities;
- Rehabilitation of existing waste rock piles;

- Installation of cover on above-ground and submerged mill tailings, where appropriate;
- Rehabilitation of additional risk(s) as warranted;
- General site clean-up;
- Re-vegetation of areas of the rehabilitated site as required; and
- Appropriate monitoring during and after rehabilitation.

3.2 Proposed Scope of Assessment

The scope of assessment defines the factors proposed to be considered in the environmental assessment and the proposed scope of those factors.

The RAs are required to consider the factors specified in section 16 of the federal Act, taking into consideration the definitions of the environment, environmental effect and project, prior to making a decision regarding whether to take action that would permit the project to proceed.

3.2.1 Proposed Factors to be Considered

As stated in the federal Act, "environmental effect" means, in respect of a project:

(a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,

(b) any effect of any change referred to in paragraph (a) on

(i) health and socio-economic conditions,

(ii) physical and cultural heritage,

(iii) the current use of lands and resources for traditional purposes by Aboriginal persons, or

(iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or

(c) any change to the project that may be caused by the environment

As described in subsections 16(1) and (2) of the federal Act, an environmental assessment conducted as a comprehensive study shall include a consideration of the following factors:

- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any

cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

- the significance of the effects referred to in the previous paragraph;
- comments from the public that are received in accordance with the cooperative environmental assessment process;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
- the need for, and the requirements of, any follow-up program in respect of the project; and
- the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

Accordingly, the EIS should include information for each of the above factors.

Further to subsections 16(1) and (2) of the federal Act, the CSR will consider the factors listed above and document any issues and concerns that may be identified through any regulatory, stakeholder and/or public consultation.

3.2.2 **Proposed Scope of the Factors to be Considered**

The proposed scope of the factors to be considered by the RAs in the comprehensive study includes the following list of environmental components likely to be affected. Additional information on these factors can be found in Section 4 of this document:

- Climate, Meteorology and Air Quality
- Geology/Geomorphology
- Hydrogeology
- Surface Hydrology
- Water Quality
- Sediment Quality
- Fish and Fish Habitat
- Navigation
- Soil Quality
- Terrestrial Ecology

- Heritage Resources
- Socio-Economic Environment

3.2.3 Valued Ecosystem Components

The assessment will consider potential effects the project may have on the environment and other aspects considered to be Valued Ecosystem Components (VECs). VECs of interest in this area will be chosen through consultation with northern residents through the Environmental Quality Committee (EQC)[1], incorporating traditional knowledge and land use. The most recent list of VECs includes the following:

Terrestrial Receptors

- Birds – Mallard, Eagle, Merganser, Ptarmigan/Grouse, Scaup
- Terrestrial Mammals – Bear, Woodland Caribou, Barren Ground Caribou, Snowshoe Hare, Moose, Wolf Lynx
- Terrestrial Vegetation – Blueberries, Labrador Tea, Lichen, Cranberries, Browse, Rosehips

Aquatic Receptors

- Aquatic Vegetation – Algae, Pond Lily, Pondweed
- Consumers of Primary producers – Zooplankton, Chironomids
- Fish – Northern Pike, Lake Whitefish, Lake Trout, White Sucker
- Aquatic Mammals – Beaver, Muskrat, Otter, Mink

3.2.4 Spatial and Temporal Boundaries

Impacts with respect to spatial and temporal boundaries may vary depending on the factor being considered, and the assessment of these impacts should consider:

- Timing/scheduling of project activities;
- Natural variations of an environmental component;
- The time necessary for an effect to become evident, taking into account the frequency of the effect as well;

1 The Northern Saskatchewan Environmental Quality Committee (EQC) was established to provide a forum to ensure consideration of concerns and recommendations of northerners on the way in which uranium development occurs in northern Saskatchewan. The EQC is currently made up of 32 representatives from "impact communities" (municipal and First Nations). Increasingly, over the years that the EQC has been operating, the EQC has become a more informed and regular voice, providing input into the decisions of both provincial and federal regulators concerning uranium mining issues in the North.

- The time required for recovery from an impact, including the estimated degree of recovery;
- Cumulative effects;
- Comments from the public; and
- Traditional knowledge and land use.

The proponent should clearly define (in text and maps) the rationale for the spatial boundaries that are used in the environmental assessment. The spatial boundaries should be determined specific to each factor being considered to effectively assess the potential environmental effects of the project. The study area, i.e., the geographic scope of the investigations, should include those local areas directly impacted by the undertakings associated with the project and also the zones within which there may be environmental effects that are cumulative, regional or global in their nature.

The temporal scale of the assessment must encompass the entire lifespan of the rehabilitation project, and will include construction, operation (including maintenance and/or modifications), decommissioning, reclamation and abandonment of project components, as well as completion of a fish habitat compensation plan, if one is required.

4.0 PROJECT-SPECIFIC GUIDELINES

Section 4 of this document outlines the specific studies that should be undertaken and the information that should be obtained as part of the EIA, and how these should be presented and evaluated in the proponent's EIS. This section describes what would conventionally be understood as Draft Project-Specific Guidelines under the Province of Saskatchewan's environmental review process and also provides further detail about what the federal RAs propose to include in their scope of factors to be considered. The guidelines portion of this document has been developed with input from provincial and federal experts. These guidelines reflect issues that have been raised by federal and provincial officials regarding the proposed rehabilitation of the former Gunnar mine site and identify the information that should be included in the EIS.

The EIA should focus on the identification of potential options for site rehabilitation activities (see subsection 4.2) and assess the potential for these options to eliminate or reduce environmental and public safety hazards at the site and minimize the risks to the environment and the public in the future.

Information provided in the EIS that is related to the proposed Gunnar site rehabilitation plan should be complete and detailed. Existing information on environmental parameters for the Gunnar site that will not be affected by the proposed rehabilitation activities, or information which is cited to provide context for the discussion of potential impacts, may be referenced and provided in summary form.

Public consultation is an integral component of EIA, requiring stakeholders to be fully informed about a proposed project, and the preparation of a public involvement plan (see subsection 4.3). The identification and assessment of potential options for site rehabilitation activities at the Gunnar site, and the selection of the preferred options for specific activities, should be discussed with regional residents, Aboriginal peoples, organizations and other stakeholders.

The EIS should provide a thorough description of the existing physical and environmental conditions at the Gunnar site (see subsection 4.5) and an assessment of the current and/or potential hazards these conditions represent in the short and long terms to the environment and to public safety.

Should the proposed plan to rehabilitate the former Gunnar site be found environmentally acceptable provincially and not likely to cause significant adverse environmental effects taking into account the implementation of mitigation measures as per the federal Act, the SRC would be required to apply to SE and the CNSC for the necessary approvals, permits and licences that would regulate the rehabilitation plan. SRC would have to comply with all applicable provincial and federal laws.

These guidelines should not be considered as either exhaustive or restrictive, as concerns other than those already identified could arise during the investigations associated with the EIA.

Reference to SE's General Guidelines for Conducting an Environmental Impact Assessment[2] is recommended. In addition, SE is prepared to provide advice and assistance throughout the EIA with regard to the identification of environmental concerns and appropriate assessment methodologies.

4.1 EIS Executive Summary

An executive summary of the EIS is required. It should briefly summarize and cross-reference the EIS under the following topic areas:

- description of the project;
- purpose of, need for, and alternative means of carrying out, the project;
- environmental effects of the project, including those from potential spills, malfunctions, or accidents;
- any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

[2] Contained in *The Saskatchewan Environmental Assessment and Review Process*. January 1996. Saskatchewan Environment Environmental Assessment Branch.

- the significance of the environmental impacts and technically and economically feasible mitigation measures;
- renewable resources that are likely to be affected significantly by the project, including current use of lands and resources for traditional purposes by aboriginal persons;
- comments from the public and SRC's responses;
- identification of uncertainties in regards to the project elements and/or environmental effects of the project, including those of a chemical, physical, and/or radiological nature; and
- the need for, and the requirements of, a follow-up program in respect of the project.

The executive summary, which can be under separate cover, should avoid the use of technical terms and jargon. To enhance involvement of northern Saskatchewan residents and First Nations in the public participation process, the executive summary should be translated into each Aboriginal language, Cree and Dene, and made accessible in video or audio form.

4.2 Project Description

The EIS should provide a comprehensive description of the conceptual elements of the Gunnar mine site rehabilitation project, including the need for the project, the development of the rehabilitation plan, the implementation of the plan, the development of monitoring programs for the completed works and the identification of the mechanisms for final abandonment and return of the site to institutional control[3].

The EIS should also describe project management and the integration of environmental, social and economic factors, occupational and public health and safety, and public consultation into the overall project. It should also provide a statement of the radiological design objectives for the project.

Local and regional maps with identifiable features should be provided to show the location of the project and the status of current land dispositions for the Gunnar site and adjacent lands.

The EIS should include a comprehensive list of the applicable federal and provincial legislation, regulations and guidelines that will apply to the planning and implementation of the proposed project. The proponent should also briefly describe (in tabular form) the activity(s) requiring approval, the project stage the approval or the permit will be

[3] As part of the decommissioning process, the proponent will need to apply for both decommissioning and abandonment licences under the *Nuclear Safety and Control Act*, prior to site being reverted back to provincial 'institutional control' i.e. responsibility of province. For additional information, please refer to the CNSC document *Licensing Process for New Uranium Mines and Mills in Canada*, March 2007.

required at, the regulatory agency in charge for the approval or permit, name of the approval or permit, and associated legislation/regulation.

4.2.1 Purpose of and Need for the Project

The EIS should establish the purpose of and need for the Gunnar Mine Site Rehabilitation Project and identify ownership and management responsibilities for the project. Under the federal Act, "purpose of" the project is defined as what is to be achieved by carrying out the project, where as “need for” is defined as the problem or opportunity the project is intending to solve or satisfy. That is, “need for” establishes the fundamental rationale for the project.

Relevant information from prior studies of the Gunnar site identifying any environmental and public concerns should be referenced. A concise history of the Gunnar uranium mine development should be provided in order to place the proposed Gunnar Mine Site Rehabilitation Project in context.

4.2.2 Development of the Rehabilitation Plan

Site Characterization and Risk Assessment

The EIS should contain a complete and detailed inventory of the abandoned physical structures (mill, mine infrastructure, maintenance and storage buildings, offices, residences); historical locations of structures no longer in place (including drum storage and tank farms, etc., that may have impacted soils); physical surface works (roads, pipelines, powerlines, drainage works, etc.); effluent treatment systems; waste disposal sites, including those for tailings, waste rock, sludges, sewage, chemicals, garbage, etc.; and residual wastes and hazardous goods, as well as contaminated soils, that are present at the former Gunnar mine site. Waste materials should be characterized chemically and physically and evaluated for their potential as environmental contaminants.

In particular, any residual materials produced by mining should be analyzed to determine whether they are mineralized, non-mineralized or potentially acid generating. Analytical results should include but not be limited to physical, chemical, and radiological characteristics, key metal contaminants, leachate data, oxidation potential, and quantity and quality of any airborne emissions e.g., SOx, NOx, dust, radon, and radionuclides. Any runoff or leachate from stockpiles or potentially contaminated areas should be characterized.

The current environmental status of the abandoned Gunnar pit should be described in detail with particular emphasis on water quality and hydraulic connections to local and regional surface and ground water systems.

Relevant details of prior studies or evaluations of the Gunnar site should be reviewed and incorporated where appropriate.

A key component of the development of the Gunnar rehabilitation plan will be the identification of the risks to the environment and the public from the abandoned Gunnar mine site. The potential environmental and public hazards associated with the abandoned features of the mine should be identified and an assessment of the current level of risk to the environment and the public from these hazards should be conducted. The EIS should provide an overview of the nature and source of any potentially significant risks, including radiological risks, from the project to the workers and the public.

The environmental database in the EIS should identify environmental contaminants at the former Gunnar mine and evaluate the current levels of impacts on air quality, surface water and groundwater quality, soil, sediment, flora and fauna from these contaminants. An evaluation should be undertaken of these contaminants assessing whether, in the future, the contaminant levels would remain stable or would increase or decrease with or without rehabilitation activities. The proponent should address all contaminants of concern at the site, including contaminants not directly related to mining and milling operations. Areas of concern could include but may not be limited to the former tank farm, maintenance shop, sewage treatment facility and garbage disposal area.

The Canadian Council of Ministers of the Environment (CCME) risk assessment guidance documents should be referenced for further information on standard risk assessment methodologies[4].

Identification of Rehabilitation Options/Alternative Means of Carrying out the Project

The EIS should provide a detailed description of the rehabilitation options, documenting the pros and cons of each option for the Gunnar site based on the identification of the current and potential hazards and levels of risk to the environment at the site. The preferred option(s) should be identified and justified.

The EIS should discuss, in detail, the criteria (environmental, engineering, economic) used by SRC to evaluate alternative means and/or options for the rehabilitation plan and justify the environmental acceptability of the preferred option using these criteria. Alternative means are defined as the various technically and economically feasible ways that the project can be implemented. The discussion should describe how radiological doses to workers and the public were considered in the assessment.

The criteria used to evaluate alternative means should reflect the potential concern for both the short-term (during implementation of the plan) and long-term (after

4 Canadian Council of Ministers of the Environment (CCME). 1996. "A Framework for Ecological Risk Assessment: General Guidance". Winnipeg, Manitoba;
CCME. 1997. "A Framework for Ecological Risk Assessment: Technical Appendices". Winnipeg, Manitoba.

abandonment of the rehabilitated Gunnar site) physico-chemical stability and environmental impacts of the project.

An important factor to consider, when developing rehabilitation options and the scope of physical rehabilitation works, is the impact of natural biological and geochemical processes on the site since abandonment. Since abandonment, natural processes may have mitigated site hazards and reduced the level of risk to the environment and the public. If natural mitigation has been significant, the current level of risk to the environment and to the public may be acceptable without additional physical rehabilitation work. Proposed physical rehabilitation work should be evaluated in terms of the current level of risk to the environment and of the potential for disturbance to effective natural mitigation processes.

The EIS should identify the objectives of the rehabilitation plan and address:

- post-rehabilitation landforms and drainage systems;
- post-rehabilitation land use options for the Gunnar site; and
- any potential opportunities for environmental enhancement.

The EIS should describe:

- removal, disposal and rehabilitation procedures for all abandoned mine, mill and waste management structures and surface disturbances, including identification of radiological criteria for defining material as "clean" for the purpose of removal from the site;
- salvage of materials from structures;
- environmental mitigation and reclamation measures, including contouring, stabilization of waste rock and soil materials, installation of cover on above-ground and submerged mill tailings, where appropriate, and re-vegetation procedures;
- salvage and/or disposal of merchantable and unmerchantable timber, slash and debris; and
- any technical issues or technological requirements specific to the project.

Specifically, the proponent should document in the EIS how the plan will address methods to isolate hazards that are potential contaminant sources from surface and ground waters, and evaluate potential post-rehabilitation contaminant loadings from the rehabilitated Gunnar site to local surface drainage systems and groundwater.

The proponent should identify and document in the EIS any hazards that cannot be mitigated by the proposed rehabilitation plan so that the long-term level of risk to the environment and the public is acceptable and that would require long-term management after the implementation of the rehabilitation plan.

The EIS should include should performance goals and objectives for the rehabilitation plan, including decision criteria to determine the need to adjust mitigation, continue monitoring as designed, modify monitoring or conclude mitigation and monitoring.

4.2.3 **Implementation of the Rehabilitation Plan**

The EIS should provide a detailed description of the logistics and implementation of the rehabilitation plan. This should include:

- anticipated commencement and schedule;
- estimated manpower and skill requirements;
- manpower housing and support facilities;
- materials, transportation, and power requirements;
- transportation of decommissioning equipment to the Gunnar site;
- transportation of any materials from the site;
- construction and decommissioning of any roads built to facilitate rehabilitation activities;
- any proposed use of the Uranium City airport and anticipated level of service;
- sourcing of materials;
- equipment requirements and maintenance;
- worker health and safety considerations, including conventional and radiological concerns;
- fire prevention and suppression programs, including wildfire; and
- emergency measures, contingency plans or procedures.

4.3 Public Involvement

Regional residents or organizations should be fully informed of the proposal to rehabilitate the former Gunnar Mining Ltd. site.

It is noted that, in the proposal, SRC discusses the formation of an Advisory Forum to facilitate public and stakeholder consultations regarding the development and implementation of the rehabilitation plan for the abandoned Gunnar site. SRC also identifies key stakeholders including First Nations, communities, planning groups, federal and provincial government agencies and industry groups. It is suggested that the provincial government agencies include: Northern Municipal Services, Saskatchewan Government Relations (community development and economic opportunities for local people); First Nations and Métis Relations (building co-operative relationships with Aboriginal people and consultation on Aboriginal and Treaty Tights), Mineral Sector Steering Committee, Saskatchewan Advanced Education and Employment (maximizing northern training and employment and possible training co-funding through Multi-Party Training Plan); and the Population Health Unit with the Athabasca Health Authority, Keewatin Yatthé and Mamawetan Churchill River Health Regions (identification of stakeholders).

The EIS should describe the program for consultation with northern residents and Aboriginal peoples. The consultation program also should provide a basis for discussion of enhancement of regional business and employment opportunities with these groups. Public involvement and any concerns raised should be documented in the EIS and their significance evaluated.

The program should promote a broader understanding of the project, the identified environmental and public hazards at the Gunnar site, and the current levels of environmental and public risk associated with these hazards. Efforts should be made to involve the public in the development of the rehabilitation plan, including the identification of issues and objectives, options for final land forms and end uses, alternative methods of rehabilitation, and the determination of the preferred alternative for rehabilitation.

Elements of the public information/consultation plan should involve the contribution of traditional knowledge to the development of the rehabilitation plan and the identification of VECs and any current and traditional uses of the Gunnar site and environs.

The EIS should describe any public consultation activities that already have been conducted regarding the planning of the former Gunnar mine site rehabilitation project.

As interest in the Gunnar Mine Site Rehabilitation Project may extend beyond the project area, SRC should be prepared to provide project information to, and address issues identified by, persons residing outside of the project area.

4.4 Description of Socio-Economic Environment

4.4.1 Land and Resource Use

The EIS should provide a description of existing and proposed future land and resource use at the project site and within the study boundaries, as well as any current use of lands and resources for traditional purposes by Aboriginal persons. The EIS should describe terrestrial and aquatic recreational activities, cultural activities and culturally significant sites, and use of renewable and non renewable resources (e.g. trapping, hunting, fishing, and gathering).

4.4.2 Business and Employment

The EIS should provide a description of employment requirements, including skill levels and training, required to implement the Gunnar rehabilitation plan. Jobs and contractor opportunities targeted for Northerners and commitments to potential local, regional and Saskatchewan suppliers should be noted.

It is noted that, in the proposal, SRC commits to provide a forum for meaningful discussion of enhanced regional business, training and employment opportunities.

4.4.3 Public and Occupational Health and Safety

The EIS should identify potential occupational health and safety concerns, both conventional and radiological, that would require management during the implementation of the Gunnar rehabilitation plan. Programs for conventional and radiological worker health and safety should be described.

Any previous reviews of the Gunnar site identifying potential hazards to public and worker safety should be referenced.

The EIS documentation should include:

- calculations of radiation exposures of all employees at the Gunnar site during the rehabilitation project, including a discussion that is provided in terms that will be understood by the public;
- potential non-radionuclide hazards to workers, including inhalation, dermal, and incidental ingestion exposure pathways;
- programs proposed to control worker radiation doses and intake of radioactive and non-radioactive substances in airborne dust;
- measures designed to provide for the health and safety of workers during the implementation of the rehabilitation project, including demolition of structures,

cleanup of hazardous and waste dangerous goods, disposal of waste materials and earthmoving activities;

- the development of occupational health and safety training modules for site workers; and
- an assessment of the potential effects of any environmental changes on human health or the use of lands, waters and resources for traditional purposes by aboriginal persons and on the quality of any country foods that may be harvested. Potential entry of contaminants of concern in liquid and airborne waste streams, e.g., radionuclides, heavy metals, into food chains and the terrestrial or aquatic environment should be described.

Programs should meet the regulatory requirements of The Occupational Health and Safety Act, 1993, The Occupational Health and Safety Regulations, 1996, The Radiation Health and Safety Regulations, 1993 and The Saskatchewan Mines Regulations, 2003.

The EIS should provide an assessment of the potential safety risks to the public following the completion of the implementation of the rehabilitation plan and following the final abandonment of the rehabilitated Gunnar site.

4.5 Description of the Environment

4.5.1 Environmental Database

The EIS should contain a description of the local environment which may be reasonably affected by the proposed Gunnar Mine Site Rehabilitation Project and allow an evaluation and prediction of the potential environmental effects of the project. The EIS should discuss whether historic exploration and industrial development activities have influenced the current status of the environment, fisheries, wildlife or resource use at the Gunnar site.

All environmental data that are included in the EIS should be collected using accepted methodologies and be made available to the federal and provincial regulators in digital form. These methodologies should be consistent in order to allow comparative use of the data and facilitate ecosystem management. The Mines Pollution Control Branch Environmental Monitoring Guidelines (March 31, 1989) should be consulted regarding baseline studies.

The database in the EIS should provide a sound basis not only for the environmental impact assessment of the rehabilitation project, but also for environmental monitoring and post-rehabilitation abandonment. The environmental data should contribute to, and be in a form compatible with, the existing environmental effects monitoring database for the assessment of potential effects on a regional scale.

Therefore, the data in the EIS should satisfy the following criteria:

(i) that the baseline data accurately describe the existing environment that may be affected by the project as proposed, as well as relevant background/reference conditions;

(ii) that the data provide a sound statistical basis for comparative monitoring to verify effects predictions, confirm effectiveness of mitigation and the development of sound abandonment procedures; and

(iii) that the EIS be self-supporting, in terms of data availability and presentation.

It is noted, however, that databases of environmental information have been compiled previously for the Gunnar site. Existing data on environmental parameters that will not be affected by the proposed rehabilitation of the Gunnar site, but are cited to provide context for the discussion of potential impacts, may be referenced or provided in summary form.

4.5.2 **Climate, Meteorology and Air Quality**

Any current databases of climatic, meteorological and air quality information, including dust, radon and gamma radiation data, should be referenced in the EIS. Any implications for the project e.g., effects on hydrologic balances, airborne dispersal of dust, arising from on-site conditions should be discussed. Any use of off-site data must be thoroughly discussed and qualified with an understanding of local and regional variability and the geographic locations of on-site and off site meteorological stations.

The EIS should include a description of baseline radiological conditions of sufficient detail to allow the impacts of the project to be assessed using subsequent monitoring information. This would include but not be limited to the results of surveys of the radiological conditions of the existing environment, including a description of any significant gaps or uncertainties in the measurements.

The EIS should include the current status of the Gunnar site with respect to climate change parameters.

4.5.3 **Geology/Geomorphology**

The EIS should contain a description of the regional and local geology and geomorphology of the Gunnar site sufficient to discuss the implications of the proposal to rehabilitate the Gunnar site. Relevant information should be discussed in terms of any potential effects on the project e.g., ground stability, slumping and piping and material weathering and acid/metal release.

Any other geological features, such as faults, fractures, shears, and seismic activity that may have an impact on the project should be identified and their significance described.

4.5.4 Hydrogeology

The EIS should contain a description of the existing regional and local hydrogeology, including the stratigraphic, hydrogeological, geophysical and geochemical properties of the geological units, such as the permeability, porosity, retardation factors, fractures and fault zones, etc. It should provide an understanding of the regional and local ground water flow patterns and rates, recharge and discharge zones, and an assessment of the interaction between the hydrogeology and the proposal. The scale should be sufficient to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond.

4.5.5 Surface Hydrology

The EIS should provide information on the regional and local hydrology, including data on watershed areas, drainage patterns, precipitation, evapotranspiration, water balance of natural and man-made water bodies (lakes, rivers, ponds, etc.), records and statistics (frequencies) of water levels and flows rates. The scale should be sufficient to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond. There should also be a discussion of the interaction between the hydrology, hydrogeology and the proposed project and the impact under current and changing climate conditions. The scale should be sufficient enough to reflect features of the Gunnar pit, waste rock/special waste disposal sites and settling pond.

The proponent should note that any works involving the diversion of surface waters would require approval by the Saskatchewan Watershed Authority.

4.5.6 Water Quality

The EIS should discuss the existing surface and ground water quality within the project boundary as well as in the background. It should provide the sampling parameters, frequencies, locations, history and analyses of the results varying with time. The anticipated quantity, quality and flow rates of surface and groundwater likely to be affected by the proposal should be provided.

4.5.7 Sediment Quality

The EIS should discuss the existing sediment quality of any potentially affected waters in and around the Gunnar site. The EIS should include physical, chemical, and radiological sediment data, including the sampling parameters, frequencies, locations, history and analyses of the results varying with time.

4.5.8 Fish and Fish Habitat

For the purpose of the assessment, "fish" refers to all life stages of resident fish, shellfish and crustaceans. "Fish Habitat" refers to the spawning grounds, nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life support processes.

Relevant information on fish and fish habitat likely to be affected (positively or negatively) by the proposed Gunnar Mine Site Rehabilitation Project should be included in the EIS. Sufficient physical, chemical, radiological and biological data should be obtained to quantify any gains or losses in the productive capacity of fish habitat resulting from the proposed Gunnar Mine Site Rehabilitation Project. This information should include the following:

- biological indicators for the project area, including a rationale for their selection;
- data on benthic invertebrate species composition and abundance;
- fish abundance/density and biomass; fish species diversity, growth rate and condition for various fish species for various trophic levels; fish movement and migration patterns; and habitat use according to fish species, life stage, time of year, etc. for both waterbodies and watercourses within the project area;
- information on fish species designated as "rare", "endangered", "threatened" and "species of special concern" under the *Species at Risk Act* and the *Saskatchewan Wildlife Act*. (refer to Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (www.cosewic.gc.ca).
- fish habitat assessments, through collection of data on bathymetry, substrate type, aquatic vegetation, etc., and the identification of important or limiting habitat types (e.g., spawning habitat) for both waterbodies or watercourses within the project area;
- sediment quality and limnology of any potentially affected waters adjacent to the Gunnar site;
- results of any previous studies at the Gunnar site predicting impacts to water quality, sediment quality, benthic invertebrates, fish, fish habitat and aquatic vegetation.

The proponent should note that provincial Special Collection Permits will be required for components of the fish data collection program.

The EIS should identify the species within the aquatic environment that are important components of food chains leading to, and used by, people living in the region. The status of these species in the impact area in regards to their relative abundance and any measured levels of contaminants in their tissues, especially heavy metals and radionuclides, should be documented.

The proponent should note that meeting the requirements of the *Fisheries Act* is mandatory, irrespective of any other regulatory or permitting system. Section 36(3) of the

Fisheries Act specifies that unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The legal definition of deleterious substance provided in subsection 34(1) of the *Fisheries Act*, in conjunction with court rulings, provides a very broad interpretation of deleterious and includes any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat.

4.5.9 **Navigation**

SRC's 2007 project proposal includes a number of potential remedial options that will be investigated as part of the environmental assessment process. Should the preferred alternatives have the potential to impact navigation, SRC would be required to submit an application to Transport Canada's Navigable Waters Protection Program. This application should be done as early as reasonably possible to avoid potential future delays.

To satisfy requirements under the federal *Navigable Waters Protection Act*, the following details should be provided in the application and should be summarized in the EIS:

- All proposed works in, on, over, under through or across any navigable waterway must be clearly identified;
- An appropriately scaled map illustrating the location of all in-water works;
- Latitude and longitude at proposed work locations;
- Chart and topographic map number;
- Photographs of the proposed work location (across, upstream and downstream views are required);
- Name of waterways and dimensions of these waterways (width and depth at point of crossing);
- Any known waterway users (including recreational, commercial and traditional) should be identified and details regarding any consultations with these user groups and/or individuals;
- Detailed drawings (both plan and profile views) of the proposed in-water work;
- Plans and descriptions of all temporary works including coffer dams, temporary crossings, or other infrastructure;
- A description of proposed construction schedules and methods for all in-water works; and

- Details regarding the predicted impacts on navigability that result from a change in the environment and a description of any proposed measures for the protection of navigation safety during and upon completion of the project.

Based on the information, the predicted impacts to navigation should be determined and measures should be proposed to improve navigational safety.

4.5.10 Soil Quality

The EIS should discuss the existing soil quality at the Gunnar site. The EIS should include information on soil profiles, including thickness of organic and mineral horizons and buffering capacities, as well as suitability for reclamation. Analyses of selected soil parameters should establish baseline conditions for monitoring potential contaminant movement and/or contaminant accumulation. Sample site selection should be sensitive to prevailing wind direction. Sample site selection should also be sensitive to plume dispersion due to the drainage pattern and the groundwater flow direction.

4.5.11 Terrestrial Ecology

Relevant information on terrestrial ecology likely to be affected by the proposed Gunnar Mine Site Rehabilitation Project should be included in the EIS. The information should address:

- description of plant communities, including species lists, dominant species and densities for canopy, understory and ground cover;
- numbers and characteristics of any potentially affected wildlife species e.g., woodland caribou, moose, bear, aquatic and riparian furbearers, avifauna, sensitive habitats, resident/migrant populations and species with commercial and/or subsistence values as well as their critical habitats;
- any “rare”, “endangered”, “threatened” and plant or animal “species of special concern” that may occur in the study area that are listed in SARA, the *Saskatchewan Wildlife Act* and/or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, www.cosewic.ca) shall be identified.

Relevant data on potentially affected vegetation, including rare, endangered and/or threatened flora, should be described for the project area. Analyses of selected vegetation parameters should establish baseline conditions for monitoring potential contaminants and/or contaminant accumulation. Sample site selection should be sensitive to prevailing wind direction, topography. Sample site selection should also be sensitive to plume dispersion due to the drainage pattern and the flow of ground and surface water.

The EIS should identify species that are important ecological receptors including species within the terrestrial environment that are important components of food chains leading

to, and used by, people living in the region. The status of these species in the impact area in regards to their relative abundance and any measured levels of contaminants in their tissues, especially heavy metals and radionuclides, should be documented. In particular, due to the mercury levels reported in fish from the Gunnar Pit, the level of mercury in the tissues of species found in proximity to the Gunnar Pit should be considered.

The EIS should address results of any previous studies at the Gunnar site that predicted impacts to wildlife and plants. It should comment on how representative the results are over space and time and biological populations; clearly separate factual lines of evidence from inference; and state any limitations on the inferences or conclusions that can be drawn from the results.

4.5.12 Heritage Resources

In the EIS, the proponent should note that following their review of the proposal, the Heritage Resources Branch, Saskatchewan Department of Culture, Youth and Recreation advised that, since the proposed Gunnar Mine Site Rehabilitation Project would take place in the footprint of the former mine disturbance, the Heritage Resources has no further concerns with the project proceeding as planned. The proponent should confirm these conclusions with local First Nations during the conduct of the EIA.

4.6 Environmental Impact Assessment

4.6.1 General Concepts

An assessment of the potential environmental effects of the Gunnar Mine Site Rehabilitation Project, and their significance, must be described in the EIS. This assessment should be supported by technical data in sufficient detail and scope to ensure an accurate assessment of the potential environmental impacts of the project, the likelihood of significant adverse effects, and whether the Gunnar Mine Site Rehabilitation Project could be justified on environmental grounds. The assessment should allow a determination whether the Gunnar Mine Site Rehabilitation Project would potentially affect the current use of lands and resources for traditional purposes by Aboriginal persons.

The assessment also should include the potential environmental effects of malfunctions or accidents that may occur in connection with the project. Any residual environmental effects that cannot be mitigated by the Gunnar Mine Site Rehabilitation Project should be identified and their significance discussed.

The changes that would occur to the Gunnar site as a consequence of implementing the proposed rehabilitation plan, and the potential environmental impacts of the rehabilitation plan, should be placed in context with the existing environmental conditions.

4.6.2 **Assessment Methodology**

The assessment methodology must be described in the EIS, and should follow the general methodology listed below:

- Identify the potential interactions between all project activities and the existing environment during all phases of the project.
- Describe the resulting changes (positive and negative, direct and/or indirect) that would likely occur to the components of the environment and VECs as a result of the identified interactions with the project. Quantitative ecological risk assessment modeling and qualitative methods will be used to identify and describe the likely adverse environmental effect. As indicated in subsection 4.2.2, the proponent is advised to refer to CCME guidance on risk assessment.
- Identify and describe technically and economically feasible mitigation measures that may be applied to each likely adverse environmental effect (or sequence of effects). Mitigation strategies should reflect avoidance, precautionary and preventive principles. Describe how each mitigation measure proposed will affect the effect based on the assessment criteria used above, e.g., implementation of mitigation measure "X" will result in a "Y" change to the potential adverse environmental effect.
- Describe the significance of the residual environmental effects that will likely occur as a result of the project, having taken into account the implementation of the proposed mitigation measures (i.e. residual environmental effects). For each identified effect, the predicted magnitude, timing, duration, frequency of occurrence, degree of reversibility, geographic extent, temporal boundaries (short or long term), probability of occurrence, and ecological context (sensitivity of the valued ecosystem components (VEC) to environmental disturbance) should be considered in determining if it is a likely significant adverse effect. The EIS must clearly explain the method used to determine effects level for each of the above listed determinants and how these levels were combined to produce an overall conclusion. This method should be transparent and reproducible. All applicable federal and provincial laws must be respected.

The results of the assessment process should be clearly documented in the text as well as in summary matrices and tables. The analysis must be documented in a manner that readily enables the reader to draw conclusions on the significance of the environmental effects.

The assessment should consider scientific analysis of ecosystem effects, along with traditional ecological knowledge (TEK), local knowledge and available experience in determining the significance of potential effects. Mitigation to manage or avoid adverse effects shall be described for these components and for each undertaking in relation to the project.

4.6.3 Project-Specific Impacts

The EIS should document and evaluate the significance of positive and adverse project-related impacts of the rehabilitation project on all components of the environment. The EIS should specifically state whether the predicted project-related impacts would alter the current levels of environmental impacts associated with the abandoned Gunnar mine site.

Impact predictions should be categorized according to defined criteria, and should be as specific and quantitative as possible. Source terms for potential surface water, ground water and atmospheric impacts, together with any contaminant transport and plume dispersion modeling results should be provided. The results of field monitoring studies and quantitative ecological risk assessment modeling should be used to derive predictions of bio-physical impact, including details of model verification (peer review of model theory), calibration (site-specific adjustment), corroboration (comparison of predicted and observed), sensitivity and uncertainty analysis. It must be clear how predicted effects to the biota exposed to the project stressor compare to the expected "reference condition" for unexposed biota on a biological population basis, taking into account natural variation. All assumptions and levels of uncertainty related to potential adverse effects should be documented.

Specific guidance on assessing effects to human health, surface and groundwater and the atmosphere are provided below. However, the EIS shall include assessment of all potentially impacted environmental components.

Guidance on Assessing Potential Impacts to Human Health

The EIS should assess the potential effects of any environmental changes on human health or the use of lands, waters and resources for traditional purposes by Aboriginal persons and on the quality of any country foods that may be harvested. Potential entry of contaminants of concern in air, liquid and airborne waste streams, e.g., radionuclides, heavy metals, into food chains and the terrestrial or aquatic environment should be described and any potential impacts and benefits from decommissioning activities should be determined.

Effects to local resources (e.g., surface and groundwater, fish, food, fur animals and plants), habitat losses and resource disruption can affect activities such as subsistence hunting and fishing, gathering, outfitting, and ceremonial/burial sites for local First Nations and non-First Nations resource users. A health impact assessment of these potential effects for people using First Nations traditional lands and public lands shall be conducted. The potential for any effects to the quality and quantity of local foods and the sport fishery also needs to be assessed from the perspective of human health impact(s).

An exhaustive list of potential contaminants that could result from the project, and those that are currently on-site, in vegetation and wildlife that would be consumed by humans shall be provided in the EIS.

To assess whether a project may have adverse effects on workers or the public (including local First Nations and non-First Nations resource users) it is necessary to assess potential radiological doses to workers and the public. A dose assessment for workers and a health impact assessment for the public, including people using First Nations traditional lands and public lands, shall be conducted. The assessment should consider normal and accidental exposure conditions from expected airborne and waterborne releases as well as from other reasonably significant sources, e.g., transport, waste, for all phases of the project.

Please note that Health Canada recommends that the proponent determine an objective concentration of radioactivity in water and gamma radiation for rehabilitation purposes. For radiological constituents in water, the Maximum Acceptable Concentration (MAC) levels suggested for drinking water are usually used to be conservative (see Health Canada 2007, Tables 7 and 8)[5]. For gamma radiation, a dose rate should be determined based on a current acceptable risk and the exposure pathways being considered.

The Proponent must clearly identify the criteria and the content to be included in the human health assessment in the EIS. Key components of the human health assessment process include the identification of potential project-human interactions (potentially exposed groups of individuals and potential exposure pathways), radiological and non-radiological constituents of potential concern (COPC), human receptors and assessment criteria. Include the following information in the description of the human health assessment method:

- predicted sources, quantities, and points of release of contaminants of concern including but not limited to radionuclides, heavy metals, and asbestos;
- selection process for constituents of potential concern; (An exhaustive list of potential contaminants that could result from the project in vegetation and wildlife that would be consumed by humans shall be provided in the EIS.)
- identification of pathways to human receptors
- identification and characterization of human receptors; Describe the use of lands, waters and resources for traditional purposes such as subsistence hunting and fishing, gathering, outfitting, and ceremonial/burial sites by aboriginal persons. Consumption of country foods should be quantified.
- method used to convert radionuclide exposure and intake by the various human receptors from the various pathways into a dose (e.g. conversion factors);

5 Health Canada. 2007. Guidelines for Drinking Water Quality. Summary Table. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/doc_sup-appui/sum_guide-res_recom/index_e.html

- criteria used to determine significance of impact (e.g. percentage of radiation dose limits).

Provide the following information for both the worker dose and human health assessment results:

- the resulting radiological (radiation doses) changes that likely would occur to workers and the public as a result of interactions with the project.

Dose to workers and the public should be assessed as a result of considering all reasonably credible routes of exposure, and (as applicable) age-dependant data, e.g., occupancy factors, breathing rates, dietary data , shielding data (for dwellings, other buildings). For public exposures this should be based on environmental fate modelling and available environmental monitoring data, while for workers this should be based on source term data and expected occupancy factors.

Guidance on Assessing Potential Impacts to Surface and Ground Water

A key element in the proposal to rehabilitate the former Gunnar mine site mine is the potential quality of local and regional surface and ground water systems following the rehabilitation of the site and its eventual abandonment. The EIS should address the following general impact assessment elements:

- hydrologic conditions and potential groundwater management problems e.g., permeability, porosity and fractures, and implications for containment/isolation of potential contaminants from groundwater systems;
- predictions for any contaminant flows and concentrations of key metal contaminants e.g., arsenic, molybdenum, selenium, in any potentially impacted groundwater, surface waters and/or sediments based on current groundwater information and results from any environmental impact pathway and contaminant transfer pathway models, including model sensitivity analyses;
- potential impacts on the local and regional hydrogeology, including re-establishment of any local and regional groundwater levels following completion of rehabilitation;
- evaluation of the potential impacts on any adjacent surface waters, including regional lake levels and water/sediment quality;
- contingency plans if contaminant migration predictions are not met, or if site-specific remediation objectives or risk management objectives are not met;
- monitoring programs for potentially-affected surface and ground waters; and
- potential effects of malfunctions, accidents or spills and contingency plans for mitigation and cleanup of spills to land or water (hazard identification including pathways to valued receptors, mitigation, environmental damage and recovery assessment, restoration).

If, at any location (e.g., waste rock storage areas), contaminated flows to the environment are anticipated the EIS should address:

- short and long term aquatic environmental effects of the loading of chemical parameters on receiving waters and predicted mixing effect zone (water quality and sediment quality change);
- potential impacts to benthic invertebrates, fish, wildlife and plants based on contaminant transport modeling results;
- potential impacts on surface and ground waters;
- evaluation of the aquatic and terrestrial environmental effects of this project using abiotic and biotic monitoring programs; and
- current or proposed studies for the tracking of changes to aquatic, terrestrial and/or human health.

Potential impacts at any stream crossing locations along existing or proposed access roads should be identified and appropriate mitigative measures proposed. Setbacks of 90 m and 30 m, respectively, are required for development activities adjacent to fish-bearing and non-fish-bearing waters.

The potential impacts from all contaminant sources at the Gunnar site following implementation of the project should be combined to provide a cumulative assessment of potential contaminant loadings to the environment. This assessment should be discussed in the context of criteria for the design of monitoring programs and abandonment planning.

Guidance on Assessing Potential Atmospheric Impacts

The EIS should discuss whether the proposal to rehabilitate the Gunnar site would contribute to greenhouse gases and/or other climate change parameters.

4.6.4 Effects of the Environment on the Project

The assessment must take into account how the environment could adversely affect the project, e.g. effects from severe weather events, forest fires, or earthquakes. The assessment must consider any potential effects of climate change on the project, including an assessment of whether the project is sensitive to changes in climatic conditions during its lifespan e.g., impact on multi-year water balance calculations and/or impacts on permafrost.

Possible important interactions between the natural hazards and the project should be identified, followed by an assessment of the effects of those interactions, the available mitigation measures, and the significance of any remaining likely adverse effects on the project.

4.6.5 Effects on the Capacity of Renewable and Non-renewable Resources

The potential interactions between the project and the environment will be identified and assessed in order to determine the likelihood of interactions between the project and resource sustainability.

4.6.6 Mitigation and Contingency Planning

The EIS must identify and describe technically and economically feasible mitigation measures that may be applied to each likely adverse environmental effect. Mitigation strategies should reflect avoidance, precautionary and preventive principles. All mitigation measures described throughout the EIS must be documented in the mitigation section.

The EIS should also document mitigation and contingency plans which would be implemented in the event of any potential containment failures, spills, malfunctions, accidents or inadvertent waste releases associated with the project. The proponent should identify commitments for response procedures to be followed should monitoring or follow-up identify unacceptable or unforeseen environmental impacts.

Although the detailed mitigation and contingency plans would be designed in consultation with regulatory agencies during licensing, the EIS should document mitigation and contingency plans that would be implemented in the event of failures of the rehabilitation procedures.

A hazard analysis or other risk-based approach should be used to identify situations where mitigative measures may be needed, and if engineering or administrative control solutions are not technically and economically feasible, then contingency plans should be developed.

The proponent should describe any legislation, regulations, guidelines, policies and specifications that will be adhered to during the rehabilitation project that will lead to avoidance or mitigation of adverse environmental effects.

4.6.7 Significance of Residual Adverse Environmental Effects

The EIS should describe the nature and extent of any residual environmental effects of the project including any residual contamination that is not addressed by the remediation project. As well, the EIS shall include a characterization as to whether residual environmental effects are significant or not significant, and the rationale for such characterization. It shall provide a detailed plan for responding to any known or predicted residual effects, and provide a procedure for identifying and responding to effects that were not predicted or foreseen. The proponent is encouraged to consult guidance materials from the Canadian Environmental Assessment Agency on determining significance of adverse environmental effects.

4.6.8 Cumulative Effects

The EIS should discuss whether existing environmental conditions, including effects from other former uranium developments in the area, would influence the project. The discussion should address whether the project-specific effects of the proposed Gunnar Mine Site Rehabilitation Project, combined with the impacts from existing and planned developments in the region would result in, or contribute to any cumulative environmental effects.

The Canadian Environmental Assessment Agency guidance documents on addressing cumulative environmental effects should also be consulted regarding the scope of cumulative impacts to be evaluated in the EIS[6].

4.7 Monitoring Programs for the Completed Rehabilitation Work

The EIS should identify the need for, and requirements of, any monitoring programs for the rehabilitated Gunnar site.

Although the detailed monitoring programs would be designed in consultation with regulatory agencies during licensing, the EIS should provide a description of proposed technically and economically feasible monitoring procedures, including parameters, locations, sampling frequency and methodology. Taking into consideration improvements in monitoring techniques, the programs should be consistent with baseline data sampling methodology and be compatible with the existing regional environmental database.

6 Canadian Environmental Assessment Agency. 1999. "Operational Policy Statement OPS-EPO/3-1999 Addressing Cumulative Environmental Effects Under the Canadian Environmental Assessment Act" (http://www.ceaa-acee.gc.ca/013/0001/0008/guide_e.htm#cumulative); Canadian Environmental Assessment Agency. 1999. "Cumulative Effects Assessment Practitioners Guide" (http://www.ceaa-acee.gc.ca/013/0001/0004/index_e.htm).

The EIS should address:

- monitoring programs for any potential environmental impacts, including potential contaminant loadings to plant and animal species that are significant in the food web and that are considered relevant Valued Ecosystem Components (VECs); and
- monitoring programs for ground water and surface water quality in the vicinity of the rehabilitated Gunnar site.

Monitoring should not only ensure compliance with any regulatory requirements but also should allow the systematic audit of the implementation of the rehabilitation plan and the predicted success of the rehabilitation procedures. The monitoring programs, in verifying the success of the rehabilitation procedures, should confirm the design criteria for rehabilitation plan.

4.8 Follow-Up Program

The need for, and requirements of a federal 'follow-up program' in respect of the project is a requirement under the federal Act. The purpose of the follow-up program is to assist in determining if the environmental and cumulative effects of the project are as predicted and to confirm whether the mitigation measures are effective. Information gathered during the follow-up will be posted on the CEAR, allowing others to review the results. Therefore, the monitoring program must describe a specific federal follow-up program that includes the detailed scope of the program together with schedule and reporting milestones. The federal follow-up may be a component of the larger monitoring program, but should be specifically defined and presented.

Effects, predictions, assumptions and mitigation actions that are to be tested in the follow-up monitoring program will need to be converted into field-testable monitoring objectives. The monitoring design should include a statistical evaluation of the adequacy of existing baseline data to provide a benchmark against which to test for project effects, and the need for any additional monitoring to establish a firmer project environmental baseline.

The follow-up program plan should be described in the EIS in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), confirm EIS assumptions and confirm effectiveness of mitigation. The EIS should include a description of the objectives of the follow-up program, the elements of the plan required to achieve the objectives, the implementation plan and reporting commitments.

The follow-up program should include an assessment of radiation exposures to members of the public using environmental monitoring results collected after implementation of the project. The program should be designed to collect information to replace important assumptions and reduce measurement uncertainties.

4.9 Site Abandonment and Return to Institutional Control

The EIS should include proposed criteria for abandoning the rehabilitated Gunnar mine site and commitments for monitoring the success of the rehabilitation work prior to final abandonment of the site.

Provisions for the long-term institutional control should be discussed, including, but not being limited to:

- record keeping or archiving that fully describes the current site conditions, the rehabilitation plan and completed works, assessments, final configurations, and release verification;
- post-abandonment site monitoring and verification;
- need for passive site management;
- land controls; and
- long term financial liabilities for monitoring, care, and maintenance, or contingency remediation.

4.10 Summary

The EIS should provide a concise, complete statement of the anticipated net environmental costs and benefits of the proposed rehabilitation of the former Gunnar mine site in both the short and long-terms. The discussion should include, if possible, any intangible costs and benefits that cannot be expressed in economic terms.

To satisfy requirements under the federal Act, this statement must include conclusions specifically on whether the project is likely to cause significant adverse effects on the environment.

5.0 INVITATION FOR COMMENTS ON DRAFT PROJECT-SPECIFIC GUIDELINES AND SCOPING DOCUMENT

Public consultation is a key component of both the provincial and federal environmental assessment processes. By policy, SE makes Draft Project-Specific Guidelines available to the public so that they can provide input into the guidelines and outline any additional issues of interest to the public that should be included in the guidelines. The federal RAs make the project scope and guidelines available to the public to meet the requirements of subsection 21(1) of the federal Act.

The federal and provincial environmental assessment agencies, therefore, jointly invite the public to comment on this Guideline-Scoping Document, comprising the provincial

Project-Specific Guidelines and federal Comprehensive Study Scoping Document. Specifically, the public is asked to comment on the following:

- the proposed scope of the project;
- factors proposed to be considered in the assessment;
- proposed scope of the factors;
- any concerns in relation to the project;
- the potential for the project to cause adverse environmental effects;
- whether any additional studies are considered necessary to evaluate the impacts of the proposed project; and
- whether all issues of interest to the public have been adequately addressed in the Guideline-Scoping Document;

Specifically related to the federal environmental assessment process, the public is also requested to comment on the ability of the federal comprehensive study to address issues relating to the project, as opposed to a review panel or mediator.

Interested persons may submit their comments on the above issues to:

Malcolm Ross
Project Manager
Environmental Assessment Branch
Saskatchewan Environment
3211 Albert Street
Regina SK S4S 5W6
306-787-6190
Fax: 306-787-0930
mross@serm.gov.sk.ca

Kristina Farmer
Federal Environmental Assessment Coordinator
Canadian Environmental Assessment Agency
445-123 Main Street
Winnipeg, MB R3C 4W2
204-984-0427
Fax: 204-983-1878
kristina.farmer@ceaa-acee.gc.ca

Persons wishing to submit comments on the proposed project may do so in writing. Comments should be sent to Saskatchewan Environment, Environmental Assessment Branch or the Canadian Environmental Assessment Agency at the addresses or facsimile transmission numbers provided above, and must be received no later than 2 May, 2008.

Please reference the file name, Former Gunnar Mine Site Rehabilitation Project in your submission. SE and the Agency will receive and share all public comments on this document, and will distribute them to the RAs, expert FAs, and relevant provincial departments.

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant	Saskatchewan Research Council
Subject	Environmental Assessment Track Report Regarding SRC's Proposed Gunnar Mine Site Rehabilitation Project
Hearing Date	September 17, 2008

RECORD OF PROCEEDINGS

Applicant:	Saskatchewan Research Council
Address/Location:	125 – 15 Innovation Blvd., Saskatoon, Saskatchewan S7N 2X8
Purpose:	Environmental Assessment Track Report Regarding SRC's proposed Gunnar Mine site rehabilitation project
Application received:	April 23, 2007
Date of hearing:	September 17, 2008
Location:	Delta Bessborough, 601 Spadina Crescent East, Saskatoon, Saskatchewan
Members present:	M. Binder, Chair A.R. Graham C.R. Barnes M. J. McDill A. Harvey D.D. Tolgyesi
General Counsel:	L. Thiele
Secretary:	M.A. Leblanc
Recording Secretary:	M. Young

Applicant Represented By	**Document Number**
• J. Muldoon, Vice-president, Environment and Forestry • C. Smudy, Chief Financial Officer and Vice-president • M. Simpson, Research Scientist	CMD 08-H17.1 CMD 08-H17.1A
CNSC staff	**Document Number**
• P. Thompson • B. Torrie • H. Nicholson	CMD 08-H17 CMD 08-H17.A
Intervenors	**Document Number**
See appendix A	

Table of Contents

Introduction

1. Saskatchewan Research Council (SRC) notified the Canadian Nuclear Safety Commission[1] (CNSC) of its intent to decommission the former Gunnar Mine site located in northern Saskatchewan, near Lake Athabasca.

2. The Gunnar uranium deposit in northern Saskatchewan was discovered in July 1952. The Gunnar site officially closed in 1964 with little or no decommissioning of the facilities. During operations, the Gunnar Mine site consisted of:

    - an open pit mine;
    - an underground mine;
    - a uranium milling facility;
    - an acid plant;
    - tailings and disposal facilities; and
    - various additional support facilities including the mine dry building, geology building, maintenance shops, housing, etc.

3. After the site closed, the blasting of a narrow, relatively shallow trench between the pit and Lake Athabasca breached the narrow bedrock ridge that separated the open pit from Lake Athabasca. As a result, water from Lake Athabasca was allowed to flow directly into the open pit, eventually flooding the underground workings as well as the pit itself. The channel to the lake allowed the free movement of water between the lake and the flooded pit until 1966 when the channel was filled with waste rock.

4. The Government of Saskatchewan and the Government of Canada have signed a Memorandum of Agreement (MOA) to address the Cold War legacy uranium mine and mill sites in northern Saskatchewan. This agreement includes the rehabilitation of the former Gunnar Mining Limited mine site. Under the MOA, Saskatchewan Energy and Resources (SER) was assigned the responsibility to ensure that the project is carried out on behalf of the two governments. SER signed a contract with the Saskatchewan Research Council (SRC) to fulfil the role of project manager and designated agent to manage and perform the required environmental assessment requirements and rehabilitation activities.

5. SRC submitted a project description for the Former Gunnar Mine Site Rehabilitation Project. Its proposal includes the following components:

    - demolition of existing buildings, facilities and structures;
    - appropriate disposal of materials resulting from demolition;
    - installation of an appropriate cover on all or a portion of the exposed mill tailings;
    - rehabilitation of existing waste rock piles;

[1]The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

- rehabilitation of additional risk(s) as warranted;
- general site clean-up;
- re-vegetation of areas of the rehabilitated site as required; and
- appropriate monitoring during and after rehabilitation.

6. CNSC authorization of SRC's request would ultimately require the issuance of a licence. Before considering SRC's application for a licence under the *Nuclear Safety and Control Act*[2] (NSCA), the CNSC must determine the results of an environmental assessment (EA). This determination includes making a decision on the potential for the project to cause adverse environmental effects, and determining a subsequent course of action under the *Canadian Environmental Assessment Act*[3] (CEAA).

7. The CEAA requires that an EA be completed if there is both a "project" and a prescribed action by a federal authority (commonly referred to as a "trigger"). The proposal involves the decommissioning of a mine site. This is an undertaking in relation to a physical work and as such is a "project" for the purposes of the CEAA.

8. The CNSC issues licences for activities involved in SRC's proposal under the authority of Section 24(2) of the NSCA, which is prescribed in the *Law List Regulations*[4]. Therefore, there is a "trigger" for an EA. The project is not of a type listed in the *Exclusion List Regulations*[5] of the CEAA.

9. As SRC's project falls within Part IV, subsection 19(a) of the *Comprehensive Study List Regulations*[6] of the CEAA, the CNSC is required to submit an Environmental Assessment Track Report to the federal Minister of Environment which includes a Recommendation to the Minister of the Environment on the proposed track for the EA. These possible tracks are to either continue the EA as a comprehensive study or refer the EA to a review panel or mediator. The CNSC and Natural Resources Canada (NRCan) are the responsible authorities[7] (RAs) for this EA.

10. In carrying out this responsibility under the CEAA, the Commission must also determine the scope of the project and the scope of the assessment. To assist the Commission in this regard, CNSC staff prepared a draft Environmental Assessment Guidelines-Scoping Document (Guidelines-Scoping Document) in consultation with other government departments, the public, Aboriginal peoples and other stakeholders. The draft Guidelines-Scoping Document, *Project-Specific Guidelines and Comprehensive Study Scoping Document – Former Gunnar Mine Site Rehabilitation Project*, contains statements of scope for the approval of the Commission and is appended to the EA Track Report, *Environmental Assessment Track Report for the Former Gunnar Mine Site Rehabilitation Project*, included in CNSC staff's document Commission Member Document (CMD) 08-H17.

---

[2] S.C. 1997, c. 9.
[3] S.C. 1992, c. 37.
[4] S.O.R./94-636.
[5] S.O.R./2007-108.
[6] S.O.R./94-638.
[7] Responsible Authority in relation to an EA is determined in accordance with subsection 11(1) of the CEAA.

Issues

11. In considering the Guidelines-Scoping Document, the Commission was required to decide, pursuant to subsections 15(1) and 16(3) of the CEAA respectively:

    a) the scope of the project for which the EA is to be conducted; and

    b) the scope of the factors to be taken into consideration in the conduct of the EA.

12. Pursuant to paragraph 21(2)(*a*) of the CEAA, the Commission was also required to report to the Minister of the Environment regarding

    (i) the scope of the project, the factors to be considered in its assessment and the scope of those factors;

    (ii) public concerns in relation to the project;

    (iii) the potential of the project to cause adverse environmental effects; and

    (iv) the ability of the comprehensive study to address issues relating to the project.

13. Pursuant to paragraph 21(2)(*b*) of the CEAA, the Commission was also required to recommend to the Minister of the Environment that CNSC continue with the EA by means of a comprehensive study, or to refer the project to a mediator or review panel.

Public Hearing

14. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to hear this matter.

15. The Panel of the Commission (hereafter referred to as the Commission), in making its decision, considered information presented for a public hearing held on September 17, 2008 in Saskatoon, Saskatchewan. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 08-H17 and CMD 08-H17.A) and SRC (CMD 08-H17.1 and CMD 08-H17.1A). The Commission also considered oral and written submissions from four intervenors (see Appendix A for a detailed list of interventions).

Decision

16. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*,

> the Canadian Nuclear Safety Commission
>
> a) approves the Environmental Assessment Guidelines-Scoping Document set out in the EA Track Report and as modified in paragraph 17 of this *Record of Proceedings*; that is, the scope of the project and the scope of the assessment were appropriately determined in accordance with sections 15 and 16 of the CEAA;
>
> b) will submit to the Minister of the Environment the EA Track Report set out in CMD 08-H17 and as modified in CMD 08-H17.A, pursuant to paragraph 21(2)(*a*) of the CEAA; and
>
> c) will recommend to the Minister of the Environment to continue with the environmental assessment of the project as a comprehensive study, pursuant to paragraph 21(2)(*b*) of the CEAA.

17. The Commission modifies the Guidelines-Scoping Document as follows: under section 3.2.2, add a subsection so that the Scope of the Factors to be Considered includes traditional knowledge. In this regard, the proponent's Environmental Impact Statement will include a specific section on the incorporation of traditional knowledge.

Issues and Commission Findings

Application of the *Canadian Environmental Assessment Act*

Federal Coordination

18. Through application of the CEAA *Federal Coordination Regulations*[8], Fisheries and Oceans Canada, Transport Canada, Indian and Northern Affairs Canada, Environment Canada, and Health Canada have been identified as Federal Authorities for providing expert assistance to the CNSC and NRCan during the EA.

19. The Commission inquired about the role of NRCan as an RA for the project. CNSC staff stated that NRCan is an RA because it is providing funding for the project. CNSC staff stated that the EA Track Report was jointly authored by the CNSC and NRCan, and as such, neither RA can unilaterally change the EA Track Report without the other's concurrence. CNSC staff noted that other federal authorities may become RAs as the project proceeds, depending on the level of involvement required.

[8] SOR/97-181.

20. The Commission inquired about the funding arrangement by NRCan. CNSC staff responded that an agreement is in place between NRCan and the Government of Saskatchewan in terms of the provision of funding to deal with the abandoned uranium mining sites in northern Saskatchewan. SRC noted that an amount of $24.6 million (M) has been established, with a clause that allows the amount to be revised if necessary.

21. CNSC staff reported that because the project is also being assessed by the Government of Saskatchewan, there are provincial EA requirements under the Saskatchewan *Environmental Assessment Act*[9] that are applicable to the proposal.

Scope of the Project

22. CNSC staff presented to the Commission a proposed *Environmental Assessment Track Report for the Former Gunnar Mine Site Rehabilitation Project* (EA Track Report), which contains the draft Guidelines-Scoping Document. The draft Guidelines-Scoping Document contains information regarding the proposed scope of the project, proposed assessment factors and the scope of these factors, pursuant to sections 15 and 16 of the CEAA.

23. The scope of the project for the purpose of the EA, as established by the CNSC and NRCan, includes the physical works and activities associated with the decommissioning of the Gunnar Mine site. CNSC staff stated that the physical works are consistent with the project description from SRC, as follows:

- demolition of existing buildings, facilities and structures;
- appropriate disposal of materials resulting from demolition;
- rehabilitation of existing waste rock piles;
- rehabilitation of pit;
- rehabilitation of mill tailings;
- rehabilitation of additional risk(s) as warranted;
- general site clean-up;
- re-vegetation of areas of the rehabilitated site as required; and
- appropriate monitoring during and after rehabilitation.

24. SRC provided an overview of the history of the Gunnar Mine site, including the dimensions of the open pit, the mill, and production statistics from 1956 to 1963.

[9] S.S. 1979-1980, c. E-10.1.

25. SRC described the current site. SRC stated that the existing facilities and infrastructure are at various stages of dilapidation. SRC identified items that will require specific attention throughout the project, including the following:

- 8000 empty steel barrels in various locations that pose minimal environmental or safety risk;
- fluorescent light ballasts, which may warrant the development of a strategy for safe disposal; and
- asbestos, the removal of which must be considered in any planned activities at the site.

26. SRC stated that the total estimated volume of waste rock is 2,710,700 cubic metres (m^3), which comprises both mine waste rock and overburden generated from surface stripping of the open pit. SRC stated that several measurements of the gamma radiation from the waste rock pile have been taken over the years, and that of the approximately 3000 measurements it took in 2004, 42 exceeded the benchmark of 2.50 microsieverts per hour (μSv/h). SRC explained that the benchmark was established at the time of the decommissioning of Eldorado Nuclear Limited's Beaverlodge mill and mines in 1983.

27. SRC stated that there are three tailings areas at the Gunnar Mine site: Gunnar Main Tailings, Gunnar Central Tailings and Langley Bay. SRC stated that several measurements regarding the water quality have been taken in the tailings areas. SRC noted that the surface water samples it took in 2004 met the Saskatchewan Surface Water Quality Objectives for all substances but Radium-226, which was 0.15 Becquerels per litre (Bq/L) compared to the objective of 0.11 Bq/L.

28. SRC provided further information regarding the flooded pit. SRC stated that there are elevated radionuclide levels in the water and sediments as well as low dissolved oxygen levels in the bottom half of the pit. SRC noted that the aquatic community of the pit did not show signs of deterioration after a 21-year period.

29. The Commission concludes that the scope of the project has been adequately determined for the purpose of the Guidelines-Scoping Document.

Scope of the Assessment

30. The draft Guidelines-Scoping Document prepared by CNSC staff identifies all the assessment factors to be considered pursuant to subsection 16(1) of the CEAA. The mandatory factors comprise the environmental effects of the project, including those that may be caused by malfunctions or accidents and any cumulative environmental effects with other projects; the significance of the effects identified above; comments from the public that are received in accordance with the CEAA and its regulations; and measures that are technically and economically feasible that would mitigate any significant adverse environmental effects of the project.

31. Since the proposed project falls within the *Comprehensive Study List Regulations* of the CEAA, subsection 16(2) of the CEAA requires that the following factors are also included for consideration: the purpose of the project; alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means; the need for, and the requirements of, any follow-up program with respect to the project; and the capacity of renewable resources that are likely to be significantly affected by the project to meet present and future needs.

32. CNSC staff has identified the environmental components that should be considered in the comprehensive study, which are most likely to be affected by the proposed project, and enumerated them in the draft Guidelines-Scoping Document.

33. CNSC staff has also identified valued ecosystem components and stated that they had been chosen through consultation with northern residents and incorporating traditional and local knowledge. CNSC staff noted that the Environmental Quality Committee (EQC) has actively contributed to the completion of the list of valued ecosystem components.

34. The Commission is satisfied that the proposed factors are appropriate and meet the requirements of the CEAA.

35. The Commission considered the scope of the factors to be assessed as proposed by CNSC staff in the Guidelines-Scoping Document. The Commission notes that, should the EA continue as a comprehensive study, the proponent will be required to prepare an Environmental Impact Statement (EIS) that follows the approved Guidelines-Scoping Document and is developed with input from both provincial and federal expert advisors, as well as members of the public, Aboriginal peoples and stakeholders. The EIS should contain a detailed description of activities and issues with respect to the scope of factors described in the following paragraphs.

Spatial and Temporal Boundaries of Assessment

36. CNSC staff identified the impacts with respect to spatial and temporal boundaries that should be considered within this assessment. The list includes timing/scheduling of project activities; natural variations of a component on the population of an environmental component; the time necessary for an effect to become evident, taking into account the frequency of the effect as well as the time required for recovery from an impact including the estimated degree of recovery; cumulative effects; comments from the public; and traditional knowledge and land use.

37. CNSC staff noted that the proponent is required to clearly define the spatial boundaries and rationale for their definition. These boundaries should be defined for each valued ecosystem component. The geographic scope of the investigations shall include those local areas directly impacted by the undertakings associated with the project and zones within which there may be environmental effects that are regional or global in their nature.

38. CNSC staff indicated that the temporal scale of the assessment should encompass the entire lifespan of the project, and will include construction, operation (including maintenance and/or modifications) and decommissioning, reclamation and abandonment and completion of the fish habitat compensation plan, if one is required.

39. Taking into consideration the comments from some intervenors, the Commission asked whether traditional knowledge should be allocated a separate part of the organizational structure of the EIS. CNSC staff responded that the EIS can be structured in such a manner to provide further emphasis on traditional knowledge.

40. The Commission asked if there had been any study of the health effects of the mine on workers during the mine's operation. CNSC staff responded that there have been studies of mine workers from that period and those studies have been used to set modern radiation protection standards and limits for current nuclear workers.

Project Description

41. CNSC staff noted that the main objective of the project description is to identify and characterize those specific components and activities that have the potential to interact with the surrounding environment under both normal operations and malfunctions and accidents.

42. CNSC staff indicated that the EIS should contain a comprehensive description of the conceptual elements of the Gunnar Mine site rehabilitation project, including the need for the project, the development of the rehabilitation plan, the implementation of the plan, the development of monitoring programs for the completed works and the identification of the mechanisms for final abandonment and return of the site to institutional control.

43. CNSC staff further stated that the EIS should contain information such as a description of project management; the integration of environmental, social and economic factors; occupational and public health and safety; public consultation; local and regional maps; and a comprehensive list of applicable federal and provincial legislation, regulations and guidelines.

44. The Commission sought clarification regarding the need for the project in the context of the EIS. SRC responded that the principal purpose and need for the project is to remove the risks to the health and safety of the public associated with the site. SRC noted that there are radiological risks and risks due to the abandoned buildings. SRC further stated that there is a need to remove the environmental risks associated with the pit, the waste rock piles and the tailings management areas. CNSC staff noted that under the CEAA, the purpose and need for the project is established by the proponent, and CNSC staff would review it upon receipt of the EIS.

45. In order to confirm that the project budget would not be a limiting factor in the rehabilitation of the Gunnar Mine site, the Commission asked how the established amount of funding would affect the project. CNSC staff responded that the proponent would assess the current level of impacts and investigate various options for conducting the project. CNSC staff explained that a number of criteria would be taken into consideration, including technical feasibility, cost, risk and social acceptability. CNSC staff stated that the option analysis would identify the best option, with the overall expectation being that the project would not cause significant environmental effects.

46. D. Lawson, in his intervention, presented options to be considered for the project going forward. To ensure that all potential, relevant options are considered, the Commission asked CNSC staff for its opinion regarding this intervention. CNSC staff responded that while the Guidelines-Scoping Document does not include any of the details provided by the intervenor, SRC is expected to go through the same process to identify options for the project. CNSC staff noted that the options identified by the intervenor would likely surface at that time.

47. The NSEQC, in its intervention, stated that the purpose of the project was not clear in terms of defining an end state objective. To ensure that there was a clear understanding, the Commission asked SRC to address this comment. SRC stated that the intent of the project is to rehabilitate the site to the greatest level possible and not to simply do the minimum amount of work. SRC stated that it intends to rehabilitate the site to a level that meets the requirements and needs of people from northern communities.

Description of the Existing Environment

48. CNSC staff explained that a description of the existing environment is needed to determine the likely interactions between the project and the surrounding environment. CNSC staff provided a list of environmental components that are typically described in the various study areas and a description of the human components of these environmental components. These include: climate, meteorology and air quality; geology/geomorphology; hydrogeology; surface hydrology; water quality; sediment quality; fish and fish habitat; navigation; soil quality; terrestrial ecology; and heritage resources. A description of the socio-economic environment should also be included.

49. SRC provided information regarding the radiological and safety hazards related to the Gunnar Mine site. SRC stated that an assessment of existing ecological and human health risks was conducted. SRC explained that a model was used to estimate exposure levels, using a range of ecological receptors in both aquatic and terrestrial environments. SRC stated that the results of the assessment highlighted that, in general, releases from the Gunnar Mine site do not pose any risk of adverse effects to aquatic biota, with the exception of aquatic plants. SRC noted that uranium exposure has the potential to result in adverse effects to aquatic species.

50. Regarding the exposure to terrestrial wildlife, SRC stated that there are no risks of adverse effects from radiation exposure; however, uranium is an issue for terrestrial animals with a large aquatic diet. SRC further stated that the dose estimates for hypothetical campers, who may spend three months per year at various locations on the site, were below the regulatory dose limit of 1 millisievert per year (mSv/y). SRC noted that the predicted doses were close to the limit, with gamma exposures accounting for the majority of the dose.

51. The Commission inquired about the level of contamination in the pit. SRC responded that the preliminary data it has indicates that the bottom of the pit has a level of contamination much higher than that at the top of the pit.

52. D. Lawson, in his intervention, provided extensive information concerning the state of the existing environment. The Commission expressed gratitude for the information provided by the intervenor and noted that it could be useful to the proponent during the later stages of the EA.

53. The Commission asked whether the extent of the studies done by the intervenor would be duplicated by SRC during the EA process. SRC responded that information such as that provided by the intervenor as well as historical data can be compared with new studies to understand how the site has changed over the years. CNSC staff noted that historical data cannot be relied upon to assess current conditions and, because of the changes in analytical methods, comparing information is often difficult. CNSC staff stated that new studies are recommended.

Conclusion on the Scope of the Assessment

54. The Commission is satisfied that the purpose of the project has been clearly defined by SRC.

55. Taking into consideration the information presented above, the Commission is satisfied that the assessment factors defined for this project and the scope of those factors have been adequately described in the Guidelines-Scoping Document appended to the EA Track Report included in CMD 08-H17.

56. The Commission modifies the Guidelines-Scoping Document so that the Environmental Impact Statement will include a specific section on the incorporation of traditional knowledge. With respect to identifying the valued ecosystem components of interest, the Commission notes that the consultation referred to in section 3.2.3 of the Guidelines-Scoping Document, Valued Ecosystem Components, should not be limited to the EQC.

Public Consultation

57. Pursuant to subsection 21(1) of the CEAA, the Commission is required to ensure public consultation with respect to the proposed scope of the project for the purposes of the environmental assessment, the factors proposed to be considered in its assessment, the proposed scope of those factors and the ability of the comprehensive study to address issues relating to the project.

58. CNSC staff informed the Commission that it has established a public registry for the assessment as required by section 55 of the CEAA and that the information about the EA has been posted on the Canadian Environmental Assessment Registry (CEAR).

59. CNSC staff noted that the comprehensive study process requires that the public and Aboriginal peoples be given an opportunity to participate in the review of the EA during the preparation of the scope of the EA, during the comprehensive study and during the comment period for the Comprehensive Study Report.

60. Jointly with the other RA and the Province of Saskatchewan, CNSC staff has solicited and received comments during the development of the Guidelines-Scoping Document. CNSC staff reported on the process of public participation, including participation from First Nations and the Métis Nation Saskatchewan (MN-S), in the EA Track Report. Appendix 4 of that document lists all the received comments, reviews how these comments have been addressed by staff from the joint RAs, and describes the revisions made to the Guidelines-Scoping Document as a result of this consultation.

61. CNSC staff reported on the general approach taken for stakeholder consultations during the EA process to date. CNSC staff stated that a 30-day public comment period on the Guidelines-Scoping Document was organized by the Environmental Assessment Branch of Saskatchewan Environment. Concurrently, an invitation for public comment was posted on the CNSC Web site and the CEAR Web site, and advertisements were placed in newspapers and broadcast on the radio. CNSC staff further stated that the Guidelines-Scoping Document and Frequently Asked Questions were made available at First Nations and Northern Hamlet offices in the Athabasca region.

62. CNSC staff reported that no member of the public or Aboriginal peoples requested a panel review for the project. CNSC staff remarked that the issues raised in the comments by members of the public and Aboriginal peoples could be addressed in a comprehensive study.

63. SRC presented its project public involvement plan to the Commission. SRC stated that this plan includes public consultations with the general public in local communities and the Athabasca sub-committee of the NSEQC. SRC outlined the various approaches it will take to appropriately involve the general public in the project. SRC stated that it will participate in a Project Review Committee, which is comprised of elected officials from local communities.

64. CNSC staff confirmed that the Guidelines-Scoping Document refers to the use of traditional knowledge and traditional ecological knowledge. CNSC staff stated that it is expected that SRC, through the conduct of technical studies, will seek to obtain that knowledge from the MN-S and other Aboriginal peoples who hold that knowledge.

65. The Commission sought further information regarding the extent to which the MN-S has been consulted to date. CNSC staff responded that there had been correspondence with the MN-S throughout the past year and a meeting was held in August 2008 to discuss how MN-S would like to participate in EAs. CNSC staff noted that it will be holding another meeting with the MN-S to discuss the Gunnar Mine site project in particular.

66. The MN-S, in its intervention, expressed concerns related to the level of consultation to date. The MN-S noted that the August 2008 meeting was a general meeting to discuss how the MN-S can get involved with the EA process and was not related to the Gunnar Mine site specifically. The MN-S stated that it felt that it had been insufficiently informed of the project, despite the Crown's duty to consult, according to section 35 of the *Constitution Act, 1982*[10]. The MN-S further stated that it feels ill-equipped to respond to the general and technical aspects of the Guidelines-Scoping Document and EA Track Report. The MN-S provided a framework to orientate future engagement and discussions regarding the EA process.

67. The Commission expressed concern regarding the points raised by the MN-S. The Commission stated that it expects SRC to improve its consultation activities regarding northern communities and the MN-S in particular. SRC stated that it would examine the methods it has used to date and make improvements. SRC further stated that it would work with the MN-S to address its concerns.

68. The Commission sought further information regarding the provision of funding for participants during the EA process. SRC stated that the funding for public consultations will be covered by the project. CNSC staff stated that funding to participate in the EA will be made available by the Canadian Environmental Assessment Agency.

69. The Commission is satisfied with the consultation process and that interested parties, stakeholders, Aboriginal peoples and the general public were adequately consulted on the scope of the assessment and the ability of the comprehensive study to address issues, as described in CMD 08-H17.

70. The Commission notes that it is satisfied with the level of consultation with the MN-S for the purpose of this stage of the EA, but expects that SRC and CNSC staff will continue to provide the MN-S with meaningful information and assistance through the next stages of the EA process.

---

[10] being Schedule B to the *Canada Act 1982* (U.K.), 1982, c. 11.

71. Furthermore, as noted in paragraph 57 of this *Record of Proceedings*, the Commission expects that the proponent and CNSC staff will consult Aboriginal peoples with the intent to incorporate traditional knowledge when carrying out the EA process.

Recommendation to the Minister of the Environment

72. To make its recommendation to the Minister of the Environment on the continuation of the EA process going forward, the Commission considered the potential adverse environmental effects of the project, the public concerns in relation to the project and the ability of the comprehensive study to address issues related to the project. These considerations are described in the following paragraphs.

Potential of the Project to Cause Adverse Environmental Effects

73. CNSC staff stated that although the specific activities associated with the proposed project have not been defined, the RAs have developed a preliminary list of the potential adverse environmental effects that may need to be considered during the EA process. The RAs considered the project description and baseline information; public and Aboriginal input to date; input from the EA Team[11]; and professional judgement.

74. CNSC staff presented a list of potential environmental effects related to the following specific environmental components:

- atmospheric environment;
- groundwater;
- surface water;
- terrestrial environment;
- human health;
- land and resource use; and
- physical and cultural heritage.

75. CNSC staff noted that these effects are examples of what could occur should mitigation measures not be put in place. CNSC staff explained that technically and economically feasible mitigation measures will be identified over the course of the EA. CNSC staff further stated that a follow-up program will be designed and implemented to ensure that the mitigation measures are effective and any necessary adaptive management actions are identified and implemented.

76. After consideration of the information presented in the material available for reference on the record, the Commission is satisfied that the potential of the project to cause adverse environmental effects has been properly addressed and adequately described in the EA Track Report included in CMD 08-H17 and as modified in CMD 08-H17.A.

[11] The term EA Team is used when the expert federal authorities are participating in the EA.

Public Concerns

77. As described in the Public Consultation section above, the Commission is satisfied that SRC and CNSC staff consulted appropriately with the public, First Nations, MN-S and other interested stakeholders. The Commission is therefore satisfied that the public had adequate opportunity to become informed about the project and express any concerns related to the project. The Commission thus considered the public concerns received during the consultations held by SRC and CNSC staff, as well as those submitted by the intervenors for this hearing.

78. D. Lawson, in his intervention, expressed the view that placing the debris from building demolition in the pit instead of the tailings would be a mistake. SRC stated that, based on the preliminary determination for funding, a significant portion of funds would be dedicated to the tailings management areas and the waste rock areas.

79. The NSEQC, in its intervention, expressed the need to honour the people who worked at the site through the preservation of certain elements of the operation. CNSC staff stated that it is aware of the desire to preserve or commemorate part of the site and, in order to address this, a revision to the Guidelines-Scoping Document requested that the proponent identify any historical artefacts that could be preserved to commemorate mining history.

80. The MN-S, in its intervention, expressed the need for improved public consultation. The MN-S noted that it feels that the NSEQC does not fully represent the needs of the MN-S, and as such, a panel review is appropriate to ensure proper consultation.

81. The MN-S also expressed concerns regarding the radiological hazards of the possible use of contaminated building materials removed from the site. The MN-S stressed the need to remove any contaminated materials from communities.

82. The Commission expects that the proponent will consider the intervenors' concerns in the next stages of the EA. With respect to the concerns raised by the MN-S, the Commission also expects CNSC staff and SRC to consult the MN-S to incorporate its traditional knowledge in the EA process.

83. The Commission is satisfied that the public concerns have been adequately described in the Guidelines-Scoping Document appended to the EA Track Report included in CMD 08-H17 and as modified in CMD 08-H17.A.

Ability of the Comprehensive Study to Address Issues Relating to the Project

84. The Commission considered the information submitted to determine the ability of the comprehensive study to address issues relating to the proposed project.

85. CNSC staff stated that, in evaluating the potential of the ability of the comprehensive study to fully address issues related to the project, the RAs considered the project description and baseline information; public and Aboriginal input to date; input from the EA Team; and professional judgement. CNSC staff informed the Commission that the public was consulted on the ability of a comprehensive study to address issues relating to the project. CNSC staff reported that no member of the public requested a referral for a panel review. CNSC staff further reported that no request for a referral to a panel review was made by the Northern Mines Monitoring Secretariat and the MN-S during the consultation process.

86. CNSC staff stated that the RAs are of the opinion that a comprehensive study can address the scientific and technical issues raised in relation to the project, based on the guidance provided to the proponent instructing the conduct of technical studies.

87. The Commission sought further information regarding the next stages of the EA process. CNSC staff responded that following the EA, the preferred option for conducting the project would be identified in the comprehensive study report. CNSC staff stated that the project would not come before the Commission for licensing until the preferred option is determined.

88. The Commission is satisfied that the information in the EA Track Report included in CMD 08-H17 adequately describes the ability of the comprehensive study to address issues relating to the project.

Recommendation to the Minister of the Environment

89. Pursuant to paragraph 21(2)(b) of the CEAA, the Canadian Nuclear Safety Commission recommends to the Minister of the Environment that the environmental assessment of the project continue as a comprehensive study, on the basis of the determinations made above.

Conclusion

90. The Commission has considered the information and submissions of the proponent, CNSC staff and the intervenors as presented for reference on the record for the public hearing.

91. The Commission, pursuant to sections 15 and 16 of the CEAA, approves the Guidelines-Scoping Document *Project-Specific Guidelines and Comprehensive Study Scoping Document – Former Gunnar Mine Site Rehabilitation Project* set out in the EA Track Report appended to CMD 08-H17 and as modified in paragraph 17 of this *Record of Proceedings*; that is, the scope of the project and the scope of the assessment were appropriately determined in accordance with sections 15 and 16 of the CEAA.

92. Pursuant to subsection 21(1) of the CEAA, the Commission is satisfied that the public has had adequate opportunity to express any concern with respect to the scope of the EA and the ability of the comprehensive study to address issues relating to the project.

93. The Commission is satisfied that the EA Track Report appended to CMD 08-H17 adequately describes the scope of project and the scope of the assessment, the public concerns in relation to the project, the potential of the project to cause adverse environmental effects and the ability of the comprehensive study to address issues relating to the project.

94. To fulfil its reporting requirements to the Minister of the Environment pursuant to paragraph 21(2)(*a*) of the CEAA, the Commission will submit the EA Track Report *Environmental Assessment Track Report for the Former Gunnar Mine Site Rehabilitation Project* to the Minister as set out in CMD 08-H17 and modified in CMD 08-H17.A. The Track Report will include the modified Guidelines-Scoping Document, as noted in paragraph 17 of this *Record of Proceedings*, to include traditional knowledge in the Scope of the Factors to be Considered.

95. Pursuant to paragraph 21(2)(*a*) of the CEAA, the Commission determines that the comprehensive study can adequately to address issues related to the project.

96. Thus, to fulfil its requirement to make a recommendation to the Minister of Environment pursuant to paragraph 21(2)(*b*) of the CEAA, the Commission recommends that the environmental assessment of the project continue as a comprehensive study.

OCT 27 2008

Michael Binder
President,
Canadian Nuclear Safety Commission

Date

Appendix A – Intervenors

Intervenors	Document Number
Dennis W. Lawson	CMD 08-H17.2 CMD 08-H17.2A
Northern Saskatchewan Environmental Quality Committee, represented by F. McDonald	CMD 08-H17.3
Metis Nation Saskatchewan, represented by D. Racine and R. Doucette	CMD 08-H17.4
Northern Saskatchewan Women's Network Incorporated	CMD 08-H17.5 CMD 08-H17.5A

Appendix B

Former Gunnar Mine Site Rehabilitation Project

Environmental Impact Statement

Prepared by

Saskatchewan Research Council

[Month Year]

Table of Contents (DRAFT V04)

List of Appendices

List of Tables

List of Figures

Appendix C

Regulatory Requirement	***Recommended Action***
General Nuclear Safety and Control Regulations SOR/2000-202 (CNSC)	
3. (1) An application for a licence shall contain the following information: (*a*) the applicant's name and business address; (*b*) the activity to be licensed and its purpose; (*c*) the name, maximum quantity and form of any nuclear substance to be encompassed by the licence; (*d*) a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence; (*e*) the proposed measures to ensure compliance with the *Radiation Protection Regulations* and the *Nuclear Security Regulations*; (*f*) any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*; (*g*) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment or prescribed information; (*h*) the proposed measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information; (*i*) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application; (*j*) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste; (*k*) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the Act and the regulations made under the Act, including the internal allocation of functions, responsibilities and authority; (*l*) a description of any proposed financial guarantee relating to the activity to be licensed; (*m*) any other information required by the Act or the regulations made under the Act for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence; and (*n*) at the request of the Commission, any other information that is necessary to enable the Commission to determine whether the applicant (i) is qualified to carry on the activity to be licensed, or (ii) will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. (2) Subsection (1) does not apply in respect of an application for a licence to import or export for which the information requirements are prescribed by the *Nuclear Non-Proliferation Import and Export Control Regulations*, or in respect of an application for a licence to transport while in transit for which the information requirements are prescribed by the P*ackaging and Transport of Nuclear Substances Regulations*.	Address during EA and EIS preparation.

Uranium Mines and Mills Regulations SOR/2000-206 (CNSC)	
3. An application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*: (*a*) in relation to the plan and description of the mine or mill, (i) a description of the site evaluation process and of the investigations and preparatory work to be done at the site and in the surrounding area, (ii) a surface plan indicating the boundaries of the mine or mill and the area where the activity to be licensed is proposed to be carried on, (iii) a plan showing the existing and planned structures, excavations and underground development, (iv) a description of the mine or mill, including the installations, their purpose and capacity, and any excavations and underground development, (v) a description of the site geology and mineralogy, (vi) a description of any activity that may have an impact on the development of the mine or mill, including any mining related activity that was carried on at the site before the date of submission of the application to the Commission, (vii) a description of the design of and the maintenance program for every eating area, (viii) the proposed plan for the decommissioning of the mine or mill, and (ix) a description of the proposed emergency power systems and their capacities; (*b*) in relation to the activity to be licensed, (i) a description of and the schedule for the planned activity, (ii) a description of the proposed methods for carrying on the activity, (iii) a list of the categories of material proposed to be mined and a description of the criteria used to determine those categories, (iv) the anticipated duration of the activity, and (v) the proposed quality assurance program for the activity; (*c*) in relation to the environment and waste management, (i) the program to inform persons living in the vicinity of the mine or mill of the general nature and characteristics of the anticipated effects of the activity to be licensed on the environment and the health and safety of persons, (ii) the program to determine the environmental baseline characteristics of the site and the surrounding area, (iii) the effects on the environment that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects, (iv) the proposed positions for and qualifications and responsibilities of environmental protection workers, (v) the proposed environmental protection policies and programs, (vi) the proposed effluent and environmental monitoring programs, (vii) the proposed location, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics, (viii) the proposed measures to control releases of nuclear substances and hazardous substances into the environment, (ix) a description of the anticipated liquid and solid waste streams within the mine or mill, including the ingress of fresh water and any diversion or control of the flow of uncontaminated surface and ground water,	Address during EA and EIS preparation.

(x) the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of security, including measures to (A) assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release, (B) notify off-site authorities of an accidental release or the imminence of an accidental release, (C) report information to off-site authorities during and after an accidental release, (D) assist off-site authorities in dealing with the adverse effects of an accidental release, and (E) test the implementation of the measures to control the adverse effects of an accidental release, (xi) the anticipated quantities, composition and characteristics of backfill, and (xii) a description of the proposed waste management system; (*d*) in relation to health and safety, (i) the effects on the health and safety of persons that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects, (ii) the proposed program for selecting, using and maintaining personal protective equipment, (iii) the proposed worker health and safety policies and programs, (iv) the proposed positions for and qualifications and responsibilities of radiation protection workers, (v) the proposed training program for workers, (vi) the proposed measures to control the spread of any radioactive contamination, (vii) the proposed ventilation and dust control methods and equipment for controlling air quality, and (viii) the proposed level of effectiveness of and inspection schedule for the ventilation and dust control systems; and (*e*) in relation to security, the proposed measures to alert the licensee to acts of sabotage or attempted sabotage at the mine or mill.	
Requirement for Code of Practice **4.** (1) In this section, "action level" means a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program or environmental protection program, and triggers a requirement for specific action to be taken. (2) An application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain a proposed code of practice that includes (*a*) any action level that the applicant considers appropriate for the purpose of this subsection; (*b*) a description of any action that the applicant will take if an action level is reached; and (*c*) the reporting procedures that will be followed if an action level is reached.	Address during EA and EIS preparation.
Licence to Decommission **7.** An application for a licence to decommission a uranium mine or mill shall contain the following information in addition to the information required by section 3 and subsection 4(2): (*a*) a description of and the proposed schedule for the decommissioning work, including the proposed starting date and the expected completion date of the decommissioning work and the rationale for the schedule; (*b*) the land, buildings, structures, components, systems, equipment, nuclear substances and hazardous substances that will be affected by the decommissioning; (*c*) the proposed measures, methods and programs for carrying on the decommissioning; and	Address during EA and EIS preparation.

(*d*) a description of the planned state of the site upon completion of the decommissioning work.	
Mineral Industry Environmental Protection Regulations, 1996 Chapter E-10.2 Reg 7 (Saskatchewan Ministry of Environment)	
Approvals required **3** A person who wishes to construct, install, alter, extend, operate or temporarily close a pollutant control facility or decommission and reclaim a mining site shall obtain the approvals required by these regulations.	Address during EA and EIS preparation.
Permanent closure of mining site **18** A person who wishes to close a pollutant control facility, mine or mill permanently shall: advise the minister in writing at least 60 days before commencing the permanent closure; and implement any decommissioning and reclamation plan approved by the minister according to the time frames set out in the plan.	Address during EA and EIS preparation.
Application for release from decommissioning and reclamation requirements **22**(1) A person who desires to be released, in whole or in part, from the requirements or obligations set out in a decommissioning and reclamation plan shall apply in writing to the minister for approval to be released. (2) The application is to include the following information and material: (a) a detailed analysis and evaluation of monitoring data and observations from the decommissioning and reclaiming and post-decommissioning and post-reclaiming monitoring program that demonstrates compliance with requirements set out in the approval; and (b) a list and assessment of remaining environmental liabilities. (3) Where the minister approves the application, the minister shall release or refund that proportion of the assurance fund that the minister considers proportionate with the degree to which the person is released from the requirements or obligations.	Address during EA and EIS preparation.
Forest Product Permit ***Sand & Gravel Permit*** ***Miscellaneous Use Permit*** ***Shoreline Alteration Permit***	Address during EA and EIS preparation.
Fisheries and Oceans Canada	
Fisheries Act The proponent should note that meeting the requirements of the *Fisheries Act* is mandatory, irrespective of any other regulatory or permitting system. Section 36(3) of the *Fisheries Act* specifies that unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The legal definition of deleterious substance provided in subsection 34(1) of the *Fisheries Act*, in conjunction with court rulings, provides a very broad interpretation of deleterious and includes any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat. (from PSG)	

For the purpose of the assessment, "fish" refers to all life stages of resident fish, shellfish and crustaceans. "Fish Habitat" refers to the spawning grounds, nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life support processes. Relevant information on fish and fish habitat likely to be affected (positively or negatively) by the proposed Gunnar Mine Site Rehabilitation Project should be included in the EIS. Sufficient physical, chemical, radiological and biological data should be obtained to quantify any gains or losses in the productive capacity of fish habitat resulting from the proposed Gunnar Mine Site Rehabilitation Project. This information should include the following: biological indicators for the project area, including a rationale for their selection; data on benthic invertebrate species composition and abundance; fish abundance/density and biomass; fish species diversity, growth rate and condition for various fish species for various trophic levels; fish movement and migration patterns; and habitat use according to fish species, life stage, time of year, etc. for both waterbodies and watercourses within the project area; information on fish species designated as "rare", "endangered", "threatened" and "species of special concern" under the *Species at Risk Act* and the *Saskatchewan Wildlife Act.* (refer to Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (www.cosewic.gc.ca). fish habitat assessments, through collection of data on bathymetry, substrate type, aquatic vegetation, etc., and the identification of important or limiting habitat types (e.g., spawning habitat) for both waterbodies or watercourses within the project area; sediment quality and limnology of any potentially affected waters adjacent to the Gunnar site; results of any previous studies at the Gunnar site predicting impacts to water quality, sediment quality, benthic invertebrates, fish, fish habitat and aquatic vegetation. The proponent should note that provincial Special Collection Permits will be required for components of the fish data collection program. The EIS should identify the species within the aquatic environment that are important components of food chains leading to, and used by, people living in the region. The status of these species in the impact area in regards to their relative abundance and any measured levels of contaminants in their tissues, especially heavy metals and radionuclides, should be documented.	Ensure sufficient baseline investigations

Appendix D

EA.Gap.Analysis.Matrix *(Based on Draft EIS Table of Contents)*

Information/data judged sufficient to conduct EA & prepare EIS	
Requires additional information/data acquisition to complete EA and prepare EIS	
Information/data not available but developed during EA and EIS preparation	

Aspect of the Project		***Adequate Data***	***Source/Location/Comments***
Scope of Project		No	From EA options analysis & project description
Project Location		Yes	*Gunnar Story* et.al.
Map of Proposed CNSC License Area		No	Developed during EA and EIS preparation
Project Schedule		No	Developed during EA and EIS preparation
Need for Project		Yes	General write-up
History of Site & Historical Data		Yes	*Gunnar Story* et.al.
Land Tenure		No	Discussion & formal notification from Prov.
Current Site Description		***Adequate Data***	***Source/Location/Comments***
Mine	Open Pit	Yes	*Gunnar Story, Sask. Report*
	Underground	Yes	*Gunnar Story*
	Assess existing closure	No	Non-destructive investigation/historical record
Mine Rock Piles	Volume	Yes	BBT
	Characterization	No	BBT/SRC – No samples of un-weathered rock
Mine Rock Seep	Volume	No	Tones/SRC but need more recent
	Characterization	Yes	Tones/SRC
	Source	No	Stable isotope investigation (^{3}H, ^{18}O)
Mill/Acid Plant		Yes	*Gunnar Story*
Mill Tailings		Yes	*Gunnar Story*
• Gunnar Main	Volume	Yes	BBT et.al.
	Characterization	No	BBT/SRC – No current samples of un-weather tails (tailings at depth) & ABA
	Perimeter mapping	No	Extent of windblown
• Gunnar Central	Volume	Yes	BBT et.al.
	Characterization	No	BBT/SRC – No current samples of un-weather tails (tailings at depth) & ABA
	Perimeter mapping	No	Extent of wind blown

• Langley Bay Tailings	Volume	Yes	BBT et.al.
	Characterization	No	BBT/SRC – No current samples of un-weather tails (tailings at depth) & ABA
	Perimeter mapping	No	Tailings beaches around perimeter of Langley Bay
Residual Chemicals	Volume	No	Detailed site inventory required (type, volume, etc.)
	Characterization	No	Detailed site inventory required (type, volume, etc.)
Auxiliary Structures		Yes	*Gunnar Story, Sask Report*
Additional Infrastructure		Yes	*Gunnar Story, Sask Report*
Contaminated Soils [Hydrocarbon, other types (?)]	Volume	No	Inventory surface area & depth (volume)
	Characterization	No	Analysis required (representative samples)
Additional Waste Materials	Volume	No	Inventory required
	Characterization	No	Analysis required (representative samples)
Detailed Topographic Survey of Site	General Site	No	50 cm resolution on general site (area +200 m)
	Tailings Areas	No	10 cm resolution on tailings (area +200 m)
Existing Environment Characterization		***Adequate Data***	***Source/Location/Comments***
Climate/Meteorology		Yes	Environment Canada/SRC/BBT
Air Quality	Radon	Yes	Saskatchewan Research Council
	Dust	No	Historical data - Snow coring only
Gamma Radiation Levels		Yes	CNSC/SRC/Brown
Geology	Regional	Yes	Beck/Schriener/*Gunnar Story*/
	Local	Yes	Assemble drill hole logs
Hydrogeology	Regional	No	Requires more robust modelling.
	Local	No	
	Flood mine to Lake	No	
	Gunnar Main	No	
	Gunnar Central	No	
	Ground water quality	No	Additional pore water sampling
Surface Hydrology	Regional	Yes	Beaverlodge, Golder
	Local (Thompson, Hurd, Spring, Zeemel Creeks & local unnamed creeks)	No	Baseline data acquisition required
	Pit to Lake	No	
	Main to Central	No	
	Central to Langley	No	

Aquatic Environment	Two Unnamed Ponds, Mudford and Spring Lakes	Bathymetry	No	Baseline data acquisition required
		Water quality	No	
		Plankton	No	
		Zooplankton	No	
		Benthos	No	
		Sediments	No	
		Fish	No	
		Aquatic macrophytes	No	
	Zeemel Bay	Bathymetry	No	Requires bathymetry
		Water quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	
		Sediments	Yes	
		Fish	Yes	
		Aquatic macrophytes	Yes	
	St. Mary's Channel	Bathymetry	No	Requires bathymetry
		Water quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	
		Sediments	No	Hg sampling of sediments required
		Fish	Yes	
		Aquatic macrophytes	No	Baseline data acquisition required
	Langley Bay	Bathymetry	No	Requires bathymetry
		Water quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	
		Sediments	No	Hg sampling of sediments required
		Fish	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Aquatic macrophytes	Yes	
	Back Bay	Bathymetry	Yes	
		Water Quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	
		Sediments	Yes	

Aquatic Environment	Back Bay	Fish	Yes	
		Aquatic macrophytes	Yes	
	Flooded Pit	Bathymetry	Yes	
		Water quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Sediments	Yes	
		Fish	Yes	
		Aquatic macrophytes	No	Baseline data acquisition required
	Dixon Bay (reference)	Bathymetry	No	Requires bathymetry
		Water quality	No	Winter sampling required
		Plankton	Yes	CanNorth 2004, CanNorth 2005, and CanNorth 2006
		Zooplankton	Yes	
		Benthos	Yes	
		Sediments	Yes	
		Fish	Yes	
		Aquatic macrophytes	No	Baseline data acquisition required
	Local Creeks (Thompson, Hurd, Spring, Zeemel ,etc.	Water quality	No	
		Sediments	No	
		Benthos	No	
		Fish	No	
Fish Habitat Assessment (Fish habitat compensation may be required for this project.)			No	Detailed quantitative fish habitat assessments of waterbodies potentially impacted to assess loss & fish habitat comp. program developed
Terrestrial Environment	Soil	General characterization	No Current	Baseline data acquisition required
	Vegetation	Under story	No	
		Forest	Tailings Only	
		Mapping	Tailings Only	
		Contaminant concentration in browse vegetation	No Current	
		Rare & Endangered Plants	No	
	Wildlife	Birds	No	Baseline data acquisition required
		Small Mammals	No	
		Large Mammals	No	
		Reptiles & amphibians	No	
		Species at Risk	No	

Heritage Resources		Heritage Branch	Yes	Statement in the PSG
		Traditional Knowledge	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies
		Sig. feature preservation	No	
Socio-Economic Environment		Provincial	Yes	2008/2009 Regional Needs Assessment Report
		Regional	Yes	
		Local	No	Baseline data acquisition required
Screening Level Ecological & Human Health Risk Ass.		Completed	Yes	SENES 2006
		Uncertainties addressed	No	Consultation required on consumption of site sourced foods
Traditional Knowledge		Regional Land Use	No	Consultations required
		Local Land Use	No	
		Heritage resources	No	
		VECs	No	
VEC Identification		PSG Listed	Yes	PSG et.al
	Consultation	NSEQC	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies
		Traditional Knowledge	No	
		PRC	No	
		Public	No	
		Country food consumption	No	
Conducting Environmental Impact Assessment and Preparing EIS			***Adequate Data***	***Source/Location/Comments***
Rehabilitation Objectives		Post Closure Land Use	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies
	Final Closure Objectives	Water	No	
		Sediments	No	
		Gamma	No	
	Application of Objective (Location)	Water	No	
		Sediments	No	
		Gamma	No	
Public Consultations	Project Planning	History of consultations	Yes	SRC
		Pre-operations Land Use	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies
		Post-project Land Use	No	
		Objectives	No	
		Options Review	No	
		Heritage	No	
		TK & TK (ecological)	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies
		Local consumption habits (site specific)	No	

Options Analysis	Buildings	No	Consultations NSEQC, Trad.Users, PRC, Public, Agencies Consultations NSEQC, Trad.Users, PRC, Public, Agencies
	Tailings	No	
	Mine Rock	No	
	Mine Rock Seep	No	
	Flooded Pit	No	
	Auxiliary Structures	No	
	Additional Infrastructure	No	
	Residual Chemicals	No	
	Other Waste Materials	No	
Project Description		***Adequate Data***	***Source/Location/Comments***
Project Description		No	Developed during environmental assessment & preparation of Environmental Impact Statement (EIS)
Project Infrastructure & Personnel Requirements	Equipment	No	
	Personnel	No	
	Environmental Personnel	No	
	Over site & management	No	
	Housing	No	
	On-site Facilities	No	
	Transportation	No	
	Electrical requirements	No	
	Fire suppression	No	
	Material sourcing	No	
	HS&WDG	No	
Borrow Material Sourcing		No	Inventory locally available borrow materials Characterize locally available borrow material
Quality Assurance Program		No	Developed during environmental assessment and preparation of Environmental Impact Statement (EIS)
Radiation Protection Program		No	
Code of Practice (Section 4.2 of UMMR)		No	
Assessment of Dose to Workers During Activity		No	Modelling
Asbestos Management Program		No	Developed during environmental assessment and preparation of Environmental Impact Statement (EIS)
Environmental Protection Program		No	
Occupational Health & Safety Program		No	
Inspection & Monitoring Program during Activity		No	
Assessing Effects of Preferred Options	Air quality	No	Modelling and Ecological & Human Health Risk Assessment of Preferred Options
	Surface hydrology	No	
	Groundwater quality	No	
	Surface water quality	No	

Assessing Effects of Preferred Options		Sediment quality	No	
		Soil quality	No	
		Non-human biologic	No	
		Human Health	No	
		Land Use	No	Developed during EA & preparation of EIS
		Renewable Use	No	Developed during EA & preparation of EIS
		Socio-economic	No	Developed during EA & preparation of EIS
Fish Habitat Compensation Program			No	Developed during EA & preparation of EIS
Assessment of Dose to Public (after project complete)			No	Modelling
Assessment of Project GHG Emissions			No	Environmental assessment and preparation of Environmental Impact Statement (EIS)
Assessment of Effects of Malfunction/Accident			No	
Assessing Effects of Environment on the Project			No	
Assessing Cumulative Effects			No	
Mitigation of Identified Effects			No	
Assessment of Residual Effects			No	
Follow-up Programs		Transition Phase Inspections	No	Environmental assessment and preparation of Environmental Impact Statement (EIS)
		Transition Phase Monitoring	No	
		Institutional Control	No	
		Continuing consultations	No	
		Fish Habitat Compensation Monitoring	No	

Appendix E

Information/data judged sufficient to conduct EA & prepare EIS Yes

Requires additional information/data acquisition to complete EA and prepare EIS No

Information/data not available but developed during EA and EIS preparation No

Gunnar Investigations Gap Analysis

Public and Stakeholder Consultations
- History of Previous Consultation
- Public/NSEQC/PRC/Traditional Users Consultations
  - Post closure land use
  - End point criteria
  - Rehabilitation options
  - Assessment of effects
  - VECs
  - Country/local food consumption
- Regulatory Agency Consultations
  - Post closure land use
  - End point criteria
  - Rehabilitation options
  - VECs

Reason for Submission
- Purpose of Submission
  - Concordance with PSG and CNSC Decision
- Proposed Project
- Scope of Project
- Project Location
- Project Operator
  - Project Management
  - Site Management
- Project Schedule
- Regulatory Context
- Land Tenure
- Need For Project

Summary of Historical Mining/milling

VECs
- Consult
  - NSEQC
  - Traditional knowledge
  - PRC
  - Public
- PSG defined

Traditional Knowledge
- Traditional Knowledge
  - Regional land use
  - Local land use
  - Heritage resources
- Traditional Ecological Knowledge
  - VECs
  - Other (?)

Existing Environment
- Historical Data Summary
- Climate
- Air Quality
  - Ambient Radon
  - Dust (?)
- Gamma Radiation Levels
  - Mine site proper
  - Auxiliary areas
    - Former townsite
    - Air strip
    - Roads
- Geology
- Hydrogeology
  - Flooded Mine/Pit to Lake
  - Tailings Areas
    - Main to Central
    - Central to Langley Bay
- Surface Hydrology
- Aquatic Ecology
  - Zeemel Bay
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - St. Mary's Channel
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - Langley Bay
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - Flooded pit
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - Back Bay
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - Dixon Bay
    - Water Quality
    - Plankton
    - Zooplankton
    - Benthos
    - Sediments
    - Fish
    - Aquatic Macrophytes
  - Local Creeks
    - Water Quality
    - Benthos
    - Sediments
    - Fish
  - Fish Habitat Assessment (to new standard)
- Terrestrial Ecology
  - Soil
  - Vegetation
    - Forest
    - Non-Forest
    - Mapping
    - Contaminant concentrations
    - Rare & Endangered Species
  - Wildlife
    - Birds
    - Small mammals
    - Large mammals
    - Species at Risk
- Heritage Resources
  - Ministry
  - Local consultation
- Socio-Economic Environment
- Ecological Risk Assessment
  - Preliminary Completed
  - Re-assessment required under Effects Assessment

Current Site Description
- Mine
  - Description
  - Current Closures
    - Raise
    - Shaft
- Mine Rock
  - Volume
  - Characterization
    - Weathered rock
    - Un-weathered rock
- Mine Rock Seep
  - Volume
  - Character
  - Source
- Mill/Acid plant
- Mill Tailings
  - Volume
  - Characterization
    - Weathered rock
    - Un-weathered rock
  - Surface Extent
- Channels between tailings areas
- Residual Chemicals
  - In-Buildings
    - Volume
    - Characterization
  - Outside
    - Volume
    - Characterization
- Auxiliary Structures
  - Mine operations related
  - Non-mine related
- Additional Infrastructure
- Hydrocarbon Contaminated Soils
  - Volume
  - Characterization
- Additional Waste Materials
  - Volume
  - Characterization

Description of Project
- Proposed Activities
  - Mine
    - Flooded Pit
    - Underground mine
      - Shaft
      - Raise
    - Pit to Lake
    - Ground water
  - Mine Rock
    - Rehabilitation strategy
  - Waste Rock Seep
    - Rehabilitation strategy
  - Mill & Acid Plant
    - Demolition
    - Disposal strategy
  - Residual Chemicals
  - Tailings
    - Surface water containment
    - Gunnar Main to Gunnar Central to Langley Bay
    - Groundwater
    - Characterization
    - Closure strategy
  - Auxiliary Facilities
    - Demolition strategy
    - Disposal strategy
  - Additional infrastructure
  - Contaminated Soils
  - Additional Waste Materials
- Regulatory Compliance
  - Acts & Regulations
  - Agencies
  - Quality Assurance Program
  - Radiation Protection Program
  - Asbestos Management Program
  - Environmental Protection Program
  - OH&S Program
  - Inspections & Monitoring
  - Training
  - Site Security
- Infrastructure/personnel Requirements
  - Equipment
  - Personal
  - Housing
  - On-site facilities
  - Transportation
  - Fire suppression
  - Materials sourcing
- HS & WDGs
- Spills Response & Management
- Re-vegetation

Options Analysis
- Building Demolition & Disposal
- Tailings
  - Gunnar Main
  - Gunnar Central
  - Langley Bay
- Waste Rock
- Flooded Pit
- Waste Rock Seep
- Ancillary Facilities
- Openings to Surface
  - Shaft
  - Raise
- Additional Waste Materials

Rehabilitation Objectives
- Post Closure Land Use
  - Consult
    - NSEQC
    - Traditional knowledge
    - PRC
    - Public
    - M of E
- Final Closure Objectives
  - Water quality
    - SSWQO (Interim 2006)
    - CWQO
    - Others
  - Sediment quality
    - CSQG
    - Others
  - Radiological objective
- Application (locations) of Final Closure Objectives
- Consult
  - NSEQC
  - Traditional knowledge
  - PRC
  - Public
  - Regulatory Agencies (Fed. & Prov.)
- Transition Phase (TO) Monitoring
- TP Care & Maintenance

Scope of Assessment
- Environmental Assessment Methodologies
  - Environmental Assessment Factors
  - Temporal boundaries
  - Spatial boundaries
  - Assessment process
  - Modeling of effects

Schedule of activities

Assessment of Effects
- During Activities
  - Dose to Workers & Public
  - GHG Emissions
  - Ecological Risk Assessment
  - Human Health Risk Assessment
    - Preliminary Completed
    - Re-assessment required?
  - Socio-Economic Impacts
- Post Rehabilitation
  - Ecological Risk Assessment
  - Human Health Risk Assessment
    - Preliminary Completed
    - Re-assessment required?
  - Socio-Economic Impacts
  - Impacts on Traditional Pursuits
- Assessment of Effects of the Environment on Project
- Cumulative Effects
- Mitigation of Identified Effects
- Residual Effects

Follow-up Programs
- Objectives
- Post Closure Inspection & Monitoring
- Institutional Control

EA.Gap.Analysis.MindMap.4CS008.002.DGH.Final.mmap - 2/11/2009 -