

Bennett Environmental Inc.
Proposed Kirkland Lake Thermal
Oxidizer Facility

Approved Terms of Reference
Pursuant to the *Environmental Assessment Act*

April 2001

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1. INTRODUCTION

Bennett Environmental Inc. (“BEI”) is a supplier of services for the high temperature treatment of contaminated solid wastes. The company has developed a technology, referred to as the Thermal Oxidizer process, that it uses to thermally treat solid wastes contaminated with non-chlorinated and low concentrations of chlorinated organic compounds including persistent organic pollutants (“POPs”). BEI is proposing to operate its technology in a facility to be built at 233 Archer Drive in the Town of Kirkland Lake, Ontario.

On April 3, 2000, BEI submitted an *Environmental Protection Act* (“EPA”) application for the proposed Kirkland Lake facility to the Ministry of the Environment (“MOE”) for approval. After being advised by MOE of several requests from members of the public for an environmental assessment (“EA”) designation, BEI volunteered on May 10, 2000 to have its proposed facility designated and reviewed under the *Environmental Assessment Act*.

The proposed Terms of Reference document has been prepared pursuant to Clause 6(2)(c) of the *Environmental Assessment Act* (“EAA”). It sets out in detail the requirements for the preparation of the environmental assessment for BEI’s proposed facility in Kirkland Lake, Ontario. The proposed Terms of Reference incorporates the work BEI has already done under the EPA approvals process and builds on this work to meet EA requirements.

The proposed Terms of Reference, given to the Ministry for approval pursuant to Section 6 of the EAA, consists of the following:

Section 2	Purpose of the Undertaking
Section 3	Description of the Undertaking
Section 4	Description of the Environment
Section 5	Environmental Assessment Work Plan
Section 6	Consultation Plan

Appendix A	Evaluation Criteria
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The proposed Terms of Reference is accompanied by the following series of Background Documents that provide additional information regarding the development of the Terms of Reference, but do not form part of the Terms of Reference submitted for approval by the Minister:

Background Document 1	BEI Business Opportunity
Background Document 2	Detailed Description of the Undertaking
Background Document 3	Rationale for the Chosen Technology
Background Document 4	Rationale for Incinerator Design
Background Document 5	Rationale for the Site in Kirkland Lake
Background Document 6	Record of Public Consultation Prior to the EA Process
Background Document 7	Record of Public Consultation on the Draft Terms of Reference

In addition to an EA approval, the following environmental approvals will be required for the proposed facility:

- Environmental Protection Act (EPA) s. 27 Approval of a Waste Disposal Site
- EPA s.9 Approval (Air)
- Ontario Water Resources Act (OWRA) s.53 Approval of Industrial Sewage Works

The following Acts and Regulations may apply to the proposed facility:

- Canadian Environmental Protection Act (CEPA) and Regulations
- Transportation of Dangerous Goods Act (TDGA)
- Ontario Mining Act (OMA)
- Federal Fisheries Act

2. PURPOSE OF THE UNDERTAKING

BEI wishes to take advantage of a business opportunity to provide a treatment service by building, owning and operating its Thermal Oxidizer process technology in Kirkland Lake, thereby providing Ontario with a world class facility for decontaminating soils and other solid materials contaminated with organic compounds.

A description of the BEI business opportunity can be found in Background Document 1 – BEI Business Opportunity.

3. DESCRIPTION OF THE UNDERTAKING

The proposed undertaking is the construction and operation of BEI's high temperature thermal destruction rotary kiln to be located in an industrial park at 233 Archer Drive, Kirkland Lake, Ontario.

The proposed facility consists of four basic functional components:

- feedstock receiving, handling, preparation, storage and fugitive control;
- thermal treatment including emission control;
- treated material and residual solids handling; and
- water collection and treatment.

The thermal destruction process equipment will consist of a rotary kiln primary combustion chamber, a secondary combustion chamber (afterburner) and an emission control system. The emission control system will consist of an evaporative gas conditioning chamber, a dry scrubber system, a fabric filter and a continuously monitored emission stack. Parameters that will be continuously monitored include: O₂, CO₂, CO, HCl, Total Hydrocarbons, SO₂, and NO_x.

Test burns and continuous emission monitoring result samples from the Récupère Sol Inc. facility in St. Ambroise, Québec will be presented in support of the chosen technology. In addition, BEI proposes to meet the Canada-wide Standards for Mercury and Dioxins.

BEI proposes to accept waste from NAFTA signatory countries. BEI will abide by all laws including all import restrictions that are in place. The proposed facility will treat up to 50,000 kg/hour of hazardous waste impacted soils, sediments, dredgings, dewatered sludge, aggregates, concrete, bricks, tiles, asphalt, wood, packaging materials, sorbents, granular materials, spent activated carbon and other similar materials contaminated with chlorinated and non-chlorinated compounds. Materials treated may include miscellaneous items such as gloves, personal protective equipment, paper and packaging materials from site remediation projects. A wide variety of organic contaminants are suitable for treatment by thermal oxidation, including pesticides, herbicides, fungicides, wood preservatives, PCB, PCP, PCDF, PAH, PCDD, TCE, coal tars, hydrocarbons and creosote. BEI has committed not to accept liquid PCBs.

A detailed description of the proposed undertaking can be found in Background Document 2 – Detailed Description of the Undertaking. The rationale for the chosen technology is contained in Background Document 3 – Rationale for the Chosen Technology. Background Document 4 – Rationale for Incinerator Design, describes the rationale for incinerator design and Background Document 5 – Rationale for the Site in Kirkland Lake provides the rationale for the site in Kirkland Lake that was chosen for the facility.

4. DESCRIPTION OF THE ENVIRONMENT

The proposed site for the BEI facility is in the Kirkland Lake Industrial Park, approximately 5 km southwest of downtown Kirkland Lake and approximately 1 km southeast of Chaput Hughes. The 44 acre site is currently owned by the Town of Kirkland Lake, is zoned Heavy Industrial and is part of Mining Lease 10667.

The BEI site is located on a generally north-facing slope reaching a maximum elevation behind the proposed development and then sloping steeply towards Murdock Creek. The vegetation on the site is composed of a mixed coniferous/deciduous forest, with shrub vegetation near Archer Drive in the disturbed portion of the property. The nearest residence to the site, located in Chaput Hughes, is approximately 650 metres away.

5. ENVIRONMENTAL ASSESSMENT WORK PLAN

The following section describes the work plan for the environmental assessment. BEI has retained a team of consultants to carry out a number of technical studies. The names of the specific qualified consultants currently retained to do the work are listed below, for information purposes.

5.1 Description of the Undertaking

The EA will update and describe in greater detail the undertaking described in Section 3.

5.2 Description of the Existing Environment

The EA will describe the existing natural, economic, social and cultural environment under a number of criteria, as provided in Table 1 (Appendix A). These descriptions will be based on the most up-to-date information and on additional baseline monitoring and project mapping available at the time the work is conducted. All study areas described below represent minimum study areas that may be expanded as required based on information generated from the inventories conducted. The level of detail of the inventories conducted will take into consideration the sensitivity of the areas under study.

5.2.1 NATURAL ENVIRONMENT

5.2.1.1 Air

The study area for the air quality study is based on a 50km radius from the centre of the BEI property, as per USEPA guidelines for local air model use.

There are no existing air quality data available for Kirkland Lake and surrounding area, making reliance upon secondary data impossible. An air monitoring program is therefore required. Envirometrex Corporation will conduct a point source and major area source emission inventory. The emission inventory component will require a search of Ministry records to obtain application information on emission rates from permitted facilities in the immediate area. Area source data on residential wood and fuel combustion, open area burning and transportation will be estimated from the Ontario emission inventory.

Baseline monitoring will determine present or background concentrations of predicted emission substances in the vicinity of estimated maximum points of impingement and at potentially sensitive receptors, prior to the operation of the proposed facility. Short term monitoring (2-3 weeks) is expected to be performed at the following sites: Chaput Hughes; Kirkland Lake; downwind of Northland Power and TCI; near Main Street and Archer Drive; south of the BEI property (near Highway 112); and at the property fence line. A number of these sites may be altered or combined, based on logistics and sampling requirements. Particulate monitoring will also be performed near Archer Drive to characterize existing dust loading from traffic to existing facilities.

5.2.1.2 Surface water, groundwater

For the BEI property, qualified consultants including a hydrogeologist from A&A Environmental Inc. will examine groundwater quality and near-surface hydraulic properties, using 8 60m boreholes already present on the property. This study will involve sampling to determine

baseline levels of applicable contaminants, measuring groundwater levels, conducting slug tests to determine transmissivity of the bedrock, and mapping the location of all surface water bodies on the site.

A&A Environmental Inc. will also conduct a baseline surface water quality study for at least two seasons, including mapping of the location of all surface water bodies on the site, including wetlands; sampling of all surface water bodies to determine baseline levels of applicable contaminants; sampling of Murdock Creek upstream, downstream and at the site to determine baseline levels of contaminants; and documentation of past environmental quality data of any affected surface water bodies.

MOE well and surface water quality records will be used, as well as topographical, geological, and other maps, and aerial photography. MOE will also be consulted to determine quality and properties of ground and surface water on the BEI property.

5.2.1.3 Sensitive/unique landforms and geological features

For a 1km radius from the centre of the BEI property, EcoTec Environmental Consultants Inc. (EcoTec) will use secondary source soil investigations to identify local soil regimes. This information will be evaluated for completeness, and a field survey will be conducted to confirm and augment this information, if necessary.

A qualified professional engineer with experience in mining, geotechnical engineering and rock mechanics will provide a report with respect to the potential impacts of mining beneath the proposed Bennett site, on the operation of the hazardous waste incinerator, both now and in the future. The report will address ground stability and control, seismic effects of blasting, and the effects of mine dewatering.

Management plans, as well as information readily available from interest groups and the general public, will be used to compile information regarding sensitive/unique landforms and geological features. Topographical, geological, and other maps and aerial photography will also be used, as required. EcoTec will consult with the Ministry of Natural Resources and the Ministry of Northern Development and Mines to obtain their input on these landforms and features.

5.2.1.4 Vegetation, fish and wildlife

For a 1km radius surrounding the centre of the BEI property, and for 3 points along Murdock Creek, EcoTec will compile background information on biophysical features, including fisheries and wildlife habitat, vegetation and wildlife species, and management strategies for these natural resources. Potential environmental sensitivities, issues and/or commitments will be examined.

Background data collection will occur concurrently with spring, summer and fall field surveys of the study area to acquire up-to-date information and a photographic record of the fisheries, aquatic habitat, terrestrial vegetation, and resident wildlife. A winter survey will augment the wildlife information for the area. Secondary source forestry investigations will be conducted to

identify local forestry resources. Follow-up augmentative surveys may also be conducted in the winter and spring.

EcoTec will use management plans, habitat inventory data sets, the MNR Natural Heritage Information Centre Database, and information readily available from interest groups and the general public to compile the inventory. Topographical, geological, and other maps and aerial photography will also be used, as required. EcoTec will also consult MNR as necessary.

Additionally, for the spring and summer season, fisheries and aquatic habitat, riparian and aquatic vegetation, surface water quality, benthic invertebrate composition and management strategies for the Blanche River at the confluence of Murdock Creek, will be reviewed in order to establish all potential environmental sensitivities, issues, and/or commitments that may influence environmental assessment requirements for this project.

5.2.1.5 Agriculture

The broad study area will include any agricultural lands near Kirkland Lake, as well as those agricultural lands in the Temiskaming area, a large agricultural area 12-24 km south of Kirkland Lake extending to Haileybury, over 80 km away. ESG International Inc. will identify and describe the agricultural resources and characteristics within this broad study area to understand the agricultural systems operating in this area.

Data will be collected through a review of existing published information (e.g., agricultural soil capability mapping, agricultural land use systems mapping and agricultural census data) as well as through reconnaissance field inventories and interviews with stakeholders, such as the Temiskaming Federation of Agriculture and the Ontario Ministry of Agriculture, Food and Rural Affairs.

Within this broad study area, more detailed or refined investigations will be undertaken and a refined study area will be defined, based on background information collected and on the findings of other studies conducted as part of this EA. Data from parallel studies of this EA, conducted on air quality (data on air dispersion modeling for the area), surface and groundwater (water quality, transmissivity), transportation (transport routes), human health risk (identification of contaminants of concern and potential pathways), and biophysical resources (soil regimes, etc.) will also be used to assess potential impacts to the farming community. The level of detail collected within the refined areas will be proportionately related to the type and extent of potential impacts.

5.2.1.6 Noise

In accordance with the requirements of MOE noise guidelines, Hatch & Associates Ltd. will review site plans and proposed equipment to be installed, and will also examine existing ambient sound levels at residences in Chaput Hughes and on Queen Street, in Kirkland Lake.

Zoning and area maps of Kirkland Lake and Chaput Hughes will be used, and Hatch & Associates Ltd. will take ambient noise measurements to establish baseline conditions and Class

designation of the BEI property. Hatch Associates Ltd. will make two site visits to conduct 2-day continuous monitoring noise surveys and take spot measurements, as required. Comprehensive frequency and sound level information for all proposed equipment, from manufacturers or suppliers, will also be examined.

5.2.2 ECONOMIC ENVIRONMENT

Commerce Management Group (CMG) will prepare a baseline assessment of the existing socio-economic conditions in the Town of Kirkland Lake and immediate vicinity, based upon an analysis of the principal economic sectors. CMG will use information provided by BEI, primary data collected directly from stakeholders (e.g., Citizens Advisory Committee members, key local suppliers, business or development associations), statistical data from sources such as Statistics Canada and the Canada Customs and Revenue Agency, and technical reports prepared as part of this process, as appropriate.

5.2.3 SOCIAL AND CULTURAL ENVIRONMENT

5.2.3.1 General social characteristics of the community

Holistic Impax will start with a 1.5 km study area from the centre of the BEI property. This study area will be re-assessed and enlarged as required, based on potential biophysical and socio-economic impacts, and in consultation with BEI, interested stakeholders, and members of the BEI consulting team.

Holistic Impax Group Inc. will use existing data sources and specific technical reports prepared by BEI and its consultants, as appropriate. Existing data sources will be used, complemented by primary data gathered directly through interviews and surveys, and through secondary data sources such as census and municipal data. Base maps, key contacts and data derived from other technical specialists will be used, as well as a content analysis of local newspapers to determine community values and perceptions. Different levels of analysis are expected to be used, for example, for abutting or adjacent land uses, the community, and transportation/access routes.

5.2.3.2 Archaeological features of the site

A.F.B.Y. Archaeological and Heritage Consultants (A.F.B.Y.) will conduct Stage I and Stage II Archaeological Site Assessments in accordance with the Ministry of Citizenship, Culture and Recreation's "Archaeological Assessment Technical Guidelines" for the BEI property.

A.F.B.Y. will examine the existing archaeological site location data for the Bennett property. This will include a search of the archaeological sites database for information on known sites in the vicinity of the subject property; a review of the land use history and present condition of the area; and gathering of basic environmental information pertaining to drainage, vegetation, soils and bedrock conditions.

5.2.3.3 Traffic and transportation issues

McCormick Rankin Corporation will evaluate the existing traffic conditions on the road network in the vicinity of the proposed BEI facility. This analysis will include an assessment of the current levels of service at the following key intersections:

- Archer Drive and Highway 66
- Highway 66 and Highway 112
- Highway 66 and Highway 11
- Highway 11 and Highway 112

The existing conditions analysis will also include an evaluation of the current levels of service between the key intersections noted above. The analysis will reflect the current conditions along the following highway sections:

- Highway 11 immediately south of Highway 112
- Highway 11 between Highways 112 and 66
- Highway 11 immediately north of Highway 66
- Highway 66 between Highway 11 and Swastika
- Highway 66 between Swastika and Highway 112
- Highway 66 between Highway 112 and Archer Drive
- Highway 66 between Archer Drive and Kirkland Lake
- Highway 112 between Highway 11 and Tarzwell
- Highway 112 between Tarzwell and Highway 66

In addition to the level-of service analyses, McCormick Rankin Corporation will review available collision data from the Ontario Ministry of Transportation and the Town of Kirkland Lake. A summary of the collision history will be developed to establish (based on the available data) the proportion of collisions involving trucks. This review will be carried out for the following road sections:

- Highway 11 between Highway 65 and Highway 112
- Highway 11 between Highway 112 and Highway 66
- Highway 11 between Highway 66 and Highway 101
- Highway 66 between Highway 11 and Highway 112
- Highway 66 between Highway 112 and Main Street
- Highway 66 between Main Street and Kirkland Lake east traffic lights
- Highway 66 between Kirkland Lake east traffic lights and provincial border
- Highway 112 between Highway 11 and Highway 66

5.3 Description of Potential Environmental Effects

The EA will provide a description of potential effects of the construction and operation of the facility based on the baseline data developed in Section 5.2, Description of the Existing Environment. The assessment for the various issues will be conducted by the same consultants described in each section above. The evaluation criteria to be used for describing the potential environmental effects are listed in Table 2 (Appendix A). Table 3 (Appendix A) describes the factors to be examined for the human health risk assessment (“HHRA”) and the ecological risk assessment (“ERA”) and Table 4 (Appendix A) lists the exposure pathways to be included in the HHRA and ERA.

5.4 Proposed Mitigation Measures and Net Environmental Effects

For each of the potential negative environmental effects identified, proposed mitigation measures to reduce or eliminate these effects will be identified. Priority will be given to avoidance of the effect, wherever possible. As well, appropriate monitoring, contingency plans and management plans will be identified, including an environmental spill management plan.

Based on the mitigation measures proposed, the expected resultant net effects that are likely to occur after the mitigation measures have been applied will be identified. Table 2 (Appendix A) illustrates how the mitigation measures and resultant net effects may be summarized and displayed in the EA.

5.5 Advantages and Disadvantages of the Undertaking

BEI will prepare a summary of the advantages and disadvantages to the environment of the undertaking and put forward recommendations as required, including proposed terms and conditions for the construction and operation of the facility.

6 CONSULTATION PLAN

Consultation is an essential component of the EA planning process. It enables stakeholders to participate in making decisions that affect them and provides the proponent with valuable input that can enhance the quality of the planning process and the undertaking.

BEI followed a comprehensive consultation during the EPA process, prior to designation under the EAA on May 10, 2000. This consultation is described in detail in Background Document 6 – Record of Public Consultation Prior to the EA Process. The Draft Terms of Reference has also undergone an extensive government and public review. This is presented in Background Document 7 – Record of Public Consultation on the Draft Terms of Reference.

BEI has developed a comprehensive consultation plan for the development of its EA. The plan is based on a set of consultation principles that it has adopted, and a variety of consultation methods and communications tools that it will employ throughout the EA planning process to seek public and government agency input and respond to comments received.

6.1 Principles of consultation

BEI has adopted the following principles to guide its consultation efforts:

- **The consultation process will be open.** BEI will make reasonable efforts to ensure that the consultation process is open to all potentially affected government agencies and organizations, groups, or individuals that may be affected or interested in the process. BEI will make reasonable efforts at the outset of the EA planning process to inform potential parties of the nature of the EA process and the undertaking, and how they may participate in the process. Once interested stakeholders have been identified, BEI will focus its consultation efforts on those parties. However, BEI will take steps to ensure that new stakeholders can become involved at later stages in the development of the EA when additional matters or more detailed sources of information are considered.
- **The consultation process will be transparent.** BEI will document the consultation process that is carried out for the development of the EA so that the process can be understood and traced.
- **The consultation process will be responsive.** BEI will provide opportunities for stakeholders to comment on the development of the EA. BEI will respond to the comments received in a timely manner.
- **The consultation process will be meaningful.** BEI will document in the EA the comments that it receives and the responses that it provides. The responses will indicate how BEI intends to incorporate comments into the EA planning process. Where BEI concurs with any suggested changes to the EA, BEI will indicate how the change will be made. Where BEI disagrees with a suggested change, BEI will provide an explanation for its position. BEI will

seek comment at key milestones before irreversible decisions are made in the EA planning process.

- **The consultation process will be flexible.** BEI's consultation process will allow response to new issues that emerge as EA planning proceeds.

6.2 Consultation methods and communication tools

BEI will employ a variety of consultation methods and communication tools appropriate to the audience and type of input being sought. BEI will seek public input using various consultation methods such as open houses, questionnaires, face-to-face meetings with groups and individuals and telephone conferences.

BEI will use a variety of communication tools to identify and respond to comments such as:

- providing copies of EA documentation for public viewing at a wide variety of locations;
- making presentations and holding question and answer sessions during open house meetings with the public, and focussed meetings with various stakeholder groups;
- issuing media advertisements of upcoming consultation events, opportunities for comment, and general responses to comments received;
- maintaining a Kirkland Lake office with staff available to take comments and provide responses; and
- maintaining an internet site for online information dissemination and opportunities for direct communication and comment with BEI on EA planning and documentation.

6.3 EA planning milestones

The following are key EA planning milestones*:

- | | |
|---|----------------------------|
| • BEI submits proposed Terms of Reference to Minister | November 20 /00 |
| • Notification of Terms of Reference Approval | March 7/01 |
| • Draft EA available for public/government comment | March 26/01 |
| • Open house (s)**and presentations on Draft EA | mid April/01 |
| • Comment period on Draft EA ends | May 21/01 |
| • Revision of Draft EA / Issue resolution | May 21 – June 29/01 |
| • Submission of EA to MOE for approval | June 29/01 |
| • Government / Public review of EA | June 29 – Aug 17/01 |
| • Notice of Completion of government EA review | Sept 21/01 |
| • Final public comment period | Sept 21 – Oct 26/01 |
| • Minister's review and decision | Jan 25/02 |

*Dates after submission are based on O. Reg. 616/98 deadlines

**The number and location of the open houses and presentations will be determined based on public feedback received.

6.4 Key Stakeholders

6.4.1 Local municipalities

BEI will advise the following of EA milestones and availability of materials:

- Clerks of members of the Temiskaming Municipal Association (TMA);
- Clerks of the Towns of Black River-Matheson, Temagami and Iroquois Falls;
- Contacts from the Local Roads Boards of Ingram, Otto, Pacaud/Catherine, Robillard, Crystal Lake, and Marquis;
- Contacts from the Bayly-Marter, Lebel (Harvey), Lebel (King), Marter, and Ossian Statute Labour Boards; and
- Contacts from the Local Services Boards of King-Lebel, Round Lake and Area, Savard and Area, Kenogami and District, Maisonville, and Bourkes.

BEI will also request to make a presentation on the Draft EA to the Temiskaming Municipal Association, and will invite those towns and boards listed above that are not a part of the TMA.

BEI will ask all clerks referred to above to display the proposed Terms of Reference and Draft EA material for public viewing during normal business hours. BEI will also ask the contacts referred to above to make EA documentation available to area residents or for display in local fire halls or community halls.

6.4.2 First Nations within the boundaries of the Temiskaming Territorial District and South Cochrane Regional District

The Beaverhouse, Matachewan, Wahgoshig, Mattagami, and Temagami First Nations are located within the Temiskaming Territorial District and vicinity. The Temiskaming First Nation is located in western Quebec. BEI will advise representatives from these communities on EA milestones, and will invite them to comment on the Draft EA.

BEI will make all reasonable efforts to determine any health and safety issues due to the proposed undertaking affecting the Timiskaming First Nation and the potential impacts on the hunting and fishing grounds of the Timiskaming First Nation resulting from the construction and operation of the hazardous waste incinerator.

BEI will also request to make a presentation on the Draft EA to representatives of these communities.

6.4.3 Federal and Provincial Government representatives

BEI will advise the MP and the MPP of the Temiskaming-Cochrane District on EA milestones and invite them to comment on the Draft EA.

6.4.4 General public/local/environmental groups

BEI will invite, by direct or electronic mailings, as required, those interested parties who provided comment prior to BEI deciding to volunteer to do an EA, on the newspaper series, at the Open Houses, through members of the Citizens Advisory Committee, and other means, to comment on the Draft EA.

As of the submission date for the proposed Terms of Reference to the MOE, the following groups expressed interest in the project, and will be included in the consultation process: the Temiskaming Federation of Agriculture, Northwatch, Temiskaming Tomorrow, and the Temiskaming Environmental Action Coalition.

These, and other local groups identified during the consultation and comment periods, will be notified of availability of EA documents, and will be asked to comment on the Draft EA.

BEI will also hold a public open house to discuss the Draft EA.

6.4.5 EA documentation respondents

Individuals and groups who provided written comment to BEI on the Draft Terms of Reference, or provide written comment on any subsequent related EA documentation prior to the Draft EA, or ask to receive EA documentation will be advised of EA milestones and invited to provide comment to BEI on the Draft EA.

6.4.6 Citizens Advisory Committee (CAC)

BEI will provide the CAC with all EA documentation, will advise the CAC of EA milestones, and will invite the CAC to comment on the Draft EA. BEI will offer to make a presentation to the CAC on the Draft EA.

6.4.7 Government Review Team

The following federal government agencies will be consulted on the EA:

- Environment Canada;
- The Department of Indian Affairs and Northern Development; and
- The Department of Fisheries and Oceans

The following provincial government agencies will be consulted on the EA:

- The Ministry of Agriculture, Food and Rural Affairs;
- Ontario Northland;
- The Ministry of Natural Resources;
- The Ministry of Northern Development and Mines;

- The Ministry of Citizenship, Culture and Recreation;
- The Ontario Native Affairs Secretariat;
- The Ministry of Transportation;
- The Ministry of the Environment: Environmental Assessment & Approvals Branch in Toronto, Northern Region Office in Thunder Bay and the Timmins District Office; and
- The Province of Québec

The following municipal government agencies will be consulted on the EA:

- The Town of Kirkland Lake; and
- Temiskaming Health Unit.

The following First Nation Organizations will be consulted on the EA:

- Beaverhouse First Nation;
- Matachewan First Nation;
- Wahgoshig First Nation;
- Mattagami First Nation;
- Temagami First Nation; and
- Timiskaming First Nation

Each reviewer will be advised of EA milestones and asked to comment on the Draft EA documentation.

6.5 Offices of public record

BEI will make use of the following locations as offices of public record. EA documentation can be viewed at these locations during normal business hours:

6.5.1 ENVIRONMENTAL ASSESSMENT AND APPROVALS BRANCH OFFICE IN TORONTO

The proposed Terms of Reference and Draft EA will be available for public viewing during normal business hours.

6.5.2 MINISTRY OF THE ENVIRONMENT, NORTHERN REGION OFFICE IN THUNDER BAY

The proposed Terms of Reference and Draft EA will be available for public viewing during normal business hours.

6.5.3 MINISTRY OF THE ENVIRONMENT, DISTRICT OFFICE IN TIMMINS

The proposed Terms of Reference and Draft EA will be available for public viewing during normal business hours.

6.5.4 PUBLIC LIBRARIES IN KIRKLAND LAKE AND NEW LISKEARD

BEI will notify the Northern College Library in Kirkland Lake and public libraries in Kirkland Lake, Englehart and New Liskeard of EA milestones and the opportunity for public comment on the Draft EA. BEI will ask these libraries to display a copy of the proposed Terms of Reference and the Draft EA during normal business hours.

6.5.5 BEI'S KIRKLAND LAKE OFFICE

BEI will also make a copy of the proposed Terms of Reference and Draft EA available for public viewing during normal business hours.

6.6 Information dissemination

6.6.1 THE MEDIA

BEI will notify *The Temiskaming Speaker*, *The Northern Daily News*, and *The Kirkland Lake Gazette* regarding EA milestones and the opportunity for public comment on the Draft EA.

BEI will also notify local radio stations, CJKL Radio and CBC Sudbury, as well as MCTV (Timmins/North Bay) regarding EA milestones and the opportunity for public comment on the Draft EA.

6.6.2 INTERNET COMMUNICATION

BEI will use its website (<http://www.bennettenv.com/kirkland.html>) to make Draft EA documentation available on-line, notify the public of upcoming EA process milestones and progress in the EA planning process, and provide on-line opportunities for comment on Draft EA documentation.

6.7 Responding to Comments Received

In order to ensure that BEI is able to respond effectively and in a timely manner to the feedback that it receives, and to incorporate this feedback into the development of the EA, BEI will implement a formal comment tracking system. The system will log each comment that is received and will track its review and response, and how the comment was incorporated into EA planning prior to the submission of the EA for approval.

Information will be summarized in tabular form indicating the commenter, the date of the receipt of the comment, the issues raised, the responses to the issues, and the date the response was sent. This documentation will be provided in the EA.

APPENDIX A – EVALUATION CRITERIA

Table 1. Criteria to describe the existing natural, economic, social and cultural environment.

<p>Natural Environment</p> <p>Air quality</p> <ul style="list-style-type: none">• Existing air pollution climatology and meteorology (e.g., inversions, low and high windspeeds, precipitation)• Existing ambient quality• Existing air emissions <p>Water quality</p> <ul style="list-style-type: none">• Existing quality of Murdock Creek• Near surface hydrogeological properties• Groundwater quality in bedrock• Baseline levels of applicable contaminants in surface and groundwater• Transmissivity of the bedrock• Groundwater flow and solute modeling <p>Sensitive/unique landforms and geological features</p> <ul style="list-style-type: none">• Nationally, provincially, regionally, or locally significant areas of natural or scientific interest• Environmentally sensitive or significant areas known to be subject to physical hazards such as erosion and slope instability• Local soil types, parameter and regimes within the study area• Mining activity beneath the proposed site <p>Vegetation, fish and wildlife</p> <ul style="list-style-type: none">• Basic water quality parameters (e.g., dissolved oxygen, pH, temperature, conductivity)• Groundwater upwellings• Existing fisheries resources• Survey of aquatic benthos• Forest resources, species composition/diversity• Rare, threatened, or endangered plant species• Rare, threatened or endangered fish and wildlife species• Key habitat areas (e.g., migratory, spawning and nursery habitat) and ecosystems• Identification of Areas of Natural and Scientific Interest (ANSIs) and Environmentally Sensitive Areas (ESAs) <p>Agriculture</p> <ul style="list-style-type: none">• Bioaccumulation in locally produced animal and plant products• Assessment of the value of agriculture in the area – description of agriculture, and estimation of the value of agricultural production, including the sales of businesses dependent on or associated with agriculture• Active farm locations, types of crops grown, type of farm operation, farm buildings and other key permanent facilities• Estimation of the level of investment in facilities• Secondary and ancillary agricultural uses

- Local agricultural employment and income

Noise

- Ambient noise levels

Economic Environment

- Land uses in the vicinity of the proposed facility
- Recreation resources in the vicinity of the proposed facility
- Approved designations as set out in municipally approved plans and zoning by-laws in the Town of Kirkland Lake
- Value of properties in the vicinity of the proposed facility
- Local employment and employment income in Kirkland Lake
- Principal economic sectors within the community
- Relevant trends in relation to employment and property values
- Municipal and provincial tax base in the Town of Kirkland Lake

Social and Cultural Environment

Characteristics, character, and demographic profile of the community

- Community characteristics – population characteristics and demographic profile, housing, community character, social stability, cultural heritage features, social facilities, recreational facilities

Archaeological features

- Land use history and present conditions
- Basic environmental information pertaining to drainage, vegetation, soils and bedrock conditions

Traffic and Transportation

- Intersection levels of service
- Levels of service between intersections
- Existing traffic conditions
- Morning and afternoon peak period intersection turning movement counts
- Intersection approach volumes
- Collision history

Table 2. Potential effects on the natural, economic and socio-cultural environment, suggested mitigation measures to reduce the negative effects, and resultant net effects with mitigation in place.

Category	Potential Effect	Mitigation	Net effect
<p><u>Natural Environment</u></p> <p>Air</p> <ul style="list-style-type: none"> • Air quality effects for normal operating conditions and upset conditions • Maximum ground level concentrations at points of impingement from expected air emissions • Maximum ground level concentrations at points of impingement from upset air emissions • Nuisance effects from dust <p>Water</p> <ul style="list-style-type: none"> • Probability and magnitude of effect from releases of PCBs, PCP, metals and various organics such as creosote and hydrocarbons from potential sources of contamination, including unloading areas, concrete and asphalt surfaces, liners, storage areas, storm water retention pools and water treatment building, and leakage from sewer pipes and sumps. • Impact of snow melt due to loading of contaminants deposited in the snow pack • For surface water, determination of potential contaminant release points and estimation of probability and magnitude of impact from each potential release point <p>Sensitive/unique landforms and geological features</p> <ul style="list-style-type: none"> • Effects on any nationally, provincially, regionally or locally significant Areas of Natural or Scientific Interest (ANSIs) and Environmentally Sensitive Areas (ESAs) that could affect water quality, vegetation, and erosion potential • Effects on any areas known to be subject to physical hazards 			

<p>such as areas of erosion and slope instability</p> <ul style="list-style-type: none"> • Negative impacts to soil regimes • Effects of mining activity beneath the proposed site <p>Vegetation</p> <ul style="list-style-type: none"> • Impact of loss of or damage to significant vegetation units, including Environmentally Sensitive Areas (ESAs) and Areas of Natural and Scientific Interest (ANSIs), significant terrestrial habitat, unique or uncommon vegetation associations, and areas of rare, threatened or endangered specimens and significant specimens <p>Forestry</p> <ul style="list-style-type: none"> • Negative impacts to the forest resource which could inadvertently impact utilization of this resource on wildlife, water quality, fisheries and erosion potential <p>Fish and wildlife</p> <ul style="list-style-type: none"> • Overall fish communities affected • Areas of critical fish habitat affected • Effects on Environmentally Sensitive Areas (ESAs), and Areas of Natural and Scientific Interest (ANSIs) • Effects on rare, threatened or endangered species • Barrier effects to migratory runs • Encroachment on, or severance of, significant wildlife habitat area • Barrier effects on wildlife movement • Effects on valued habitat and ecosystems <p>Noise</p> <ul style="list-style-type: none"> • Effects on ambient noise levels 			
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<p><u>Agriculture</u></p> <ul style="list-style-type: none"> • Potential contaminant pathways and bio-magnification within food production processes and natural chains • Potential impact to the agricultural resource base and farmer livelihoods by actual or perceived contamination of food by emissions • Disruption of traditional transportation routes for farm machinery and produce resulting from increased truck traffic volumes or events such as road closures due to spills • Potential crop chemical uptake and livestock dosage • Effect of air emissions and contaminant distribution/long term accumulations and persistence • Potential direct surface and ground water contamination • Potential effects on local agricultural employment and employment income 			
<p><u>Economic Environment</u></p> <ul style="list-style-type: none"> • Effects on local employment and employment income • Effects on municipal and provincial tax base and property taxes • Effects on land uses in the vicinity of the proposed site • Effects on property values in the vicinity of the proposed site • Effects on existing businesses, residential and commercial recreational values • Effect of employment and economic development opportunities created by the project 			
<p><u>Social And Cultural Environment</u></p> <p>General social and cultural environment</p> <ul style="list-style-type: none"> • Effects on activities that occur on residential properties • Effects on activities that occur on social facility properties (including effects on sensitive populations) 			

<ul style="list-style-type: none">• Effects on recreational activities (including effects on sensitive populations)• Effects on day to day community activities (e.g., recreation patterns, traffic patterns)• Effects on business activities with a social focus (including effects on sensitive populations and sensitive business activities)• Effects on cultural-heritage features• Effects on social stability• Effects on community character <p>Archaeological features</p> <ul style="list-style-type: none">• Effects on potential archaeological sites <p>Transportation</p> <ul style="list-style-type: none">• Incremental truck traffic increases on the road network• Incremental level-of-service impacts at key intersections• Incremental level-of-service impacts along road sections between intersections• Likelihood of collisions involving trucks, based on local collision history• Incremental effect of site-related traffic at key intersections• Effects of additional truck traffic through sensitive areas <p>Human health and Ecological risk assessments</p> <ul style="list-style-type: none">• See Tables 3 and 4			
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Table 3. Factors to be examined for the human health risk assessment and ecological risk assessment.

Scenarios	Baseline conditions	Full Operations	Upset Situations	Effects	Mitigation
<ul style="list-style-type: none"> • Air Via facility stack and fugitive emissions data and modeled ambient air concentrations at the maximum point of impingement • Drinking Water Via potential effects (cumulated over the estimated operational life of the facility) to surface and/or subsurface potable water resources • Surface Soil Via direct deposition of particulate/ vapour phase compounds on soil during operational mode, cumulated over the estimated operational life of the facility • Agricultural and Home Garden Produce Via wet and dry deposition of particulate/vapour phase compounds onto produce and surrounding soils during full operational modes, cumulated over the estimated operational life of the facility • Fish and Wildlife Hunted and caught for the purposes of consumption or sale, with exposures to emissions cumulated over the estimated operational life of the facility • Mother's Milk (infants only) Based on the mother experiencing all exposure pathways for emission substances over the estimated operational life of the facility 					

Table 4. Exposure pathways for the health and ecological risk assessment*.

Human Health Exposure Pathways	Ecological Exposure Pathways
<ul style="list-style-type: none"> ▪ Ingestion of locally grown garden vegetables ▪ Ingestion of locally grown beef ▪ Ingestion of locally produced milk and dairy products ▪ Ingestion of locally caught wildlife and fish from Gull Lake ▪ Ingestion of market based foods (i.e., commercially packaged and produced foods) ▪ Ingestion of chemically impacted breast milk (by infants only) ▪ Ingestion of soils and dust ▪ Inhalation of outdoor air and indoor air ▪ Inhalation of airborne dusts ▪ Dermal contact with soils and dusts ▪ Dermal contact with surface water while swimming and/or bathing 	<ul style="list-style-type: none"> ▪ Ingestion of prey species (vegetation, invertebrates, mammals or fish) ▪ Ingestion of surface water (wildlife) ▪ Accidental ingestion of soils/dusts ▪ Contact with surface water
<p>* Exposure assessment for a point source, such as BEI’s proposed Kirkland Lake facility, must be based on the accumulation of the predicted substances emitted through each exposure pathway over the estimated operational life of the facility, based on the environmental/fate transport characteristics of the predicted emission substances. In addition, the exposure assessment must also consider exposures of selected receptors originating from other sources of the predicted emission substances, based on background or ambient concentrations of predicted emissions from the proposed facility.</p>	