

# **Health Aspects of Environmental Impact Assessment Volume II**

**Summary of Current Practice**

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**A Manuscript Report Prepared for the  
Canadian Environmental Assessment  
Research Council  
January 1988**

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## 1. INTRODUCTION

Environmental impact assessment (EIA), whether implemented through legislation or **policy** or as part of a separate permitting procedure, is a valuable **tool** used in the planning and development of projects which may have a **significant** impact on the environment. Human health, which to a large extent is dependent upon the health of the environment, may receive varying degrees of attention in EIA depending on the project's potential **impact** on health. Health concerns may be addressed through the application of health-based standards during the **planning** and development of a proposed project, or they may be addressed through an **actual analysis** (e.g., risk assessment) of the potential health impacts. When an assessment of potential health impacts is necessary, the process is often completely integrated with the rest of the EIA and it may contain any degree of complexity.

Environmental health and the assessment of human health impacts in EIA are **receiving** increased attention worldwide and are being **recognized** as legitimate fields of study and practice. The World Health Organization published a task group report (Working Group on the Health and Safety Component of Environmental Impact Assessment, 1986) discussing the concept of Environmental Health Impact Assessment, a term used to describe the health component of EIA. In Ottawa, a national workshop on the subject, which was attended by EIA and health professionals from across the country, concluded that when potentially significant health impacts may be caused by a proposed project, the EIA should include an assessment of the risks to human health as part of the assessment of risks to the environment.

This research project, sponsored by the Canadian Environmental Assessment Research Council (**CEARC**), was initiated to find out the extent to which current EIA practices in Canada, the United States, and several European countries address risks to human health.

This report is divided into three volumes. Volume I contains an overview of current **practice** for Canada, the United States, and Europe, major trends and findings in Canada, recommendations for future **work**, and a strategy for implementation of the recommendations. This volume, Volume II, contains a more detailed discussion of current practice, and Volume III contains the report's appendices.

## 2. SUMMARY OF CURRENT PRACTICE

### 2.1 introduction

Volume I presents a general overview of current practice in Canada, the United States, and Europe. This volume presents more detailed summaries of current practice for each of the provinces, the federal government of Canada, the federal government of the United States (U.S.), three states in the U.S., and several European countries. Current practice for each province, state, and country is displayed in several tables, each with the same format and accompanied by explanatory notes where necessary. The tables display information on the EIA process and the content of EISs to provide the reader with a thorough and up-to-date indication of how health is currently addressed in EIA. The reader is cautioned to keep in mind the following points when reviewing the tables:

- EIA has been defined in this project as broadly as possible. That is, EIA refers to any process that can be considered an assessment of potential environmental impacts for a proposed project, whether the assessment is formally promulgated as EIA through policy or legislation or informally implemented as part of a permitting procedure. The following terms are used frequently throughout the report. A term's definition in this report may not be consistent with its usage in a particular province or agency but for the purposes of consistency and clarity, these standardized definitions are used:

"Environmental Impact Assessment" (EIA) - refers to the process followed to develop an initial environmental evaluation (IEE) or environmental impact statement (EIS);

"Initial Environmental Evaluation" (IEE) - refers to a report which may be requested to address certain unknowns associated with potential impacts or mitigation possibilities. The IEE is not an EIS but may be required to provide information needed to make the decision whether or not to require an EIS;

"Environmental Impact Statement" (EIS) - refers to the detailed report on the proposed action, alternatives to the proposed action, the affected environment, environmental impacts, and mitigation measures, among other topics.

"Human Health Impacts" - potential acute or chronic impacts on human health which may be caused by direct, indirect, or cumulative exposures to a contaminant or contaminants;

"Health Impact Assessment" - an assessment which may be part of an EIA and which specifically addresses potential human health impacts.

"Environmental Health" - the subject dealing with human health as it may be affected by the condition of the natural environment;

"Proponent" - the organization, company, or the department planning to undertake a proposal;

"Initiating Department" - any government department or agency that is a decision-making authority for a proposal.

- Because generalizations cannot be made regarding how EIA may be implemented, the tables do not reflect any particular EIA procedure. Rather, a list of possible components of a health impact assessment, as integrated into EIA, is used. For example, in the tables preceding the written text, the left hand column displays components that may be included in a health impact assessment, and the right hand column displays the responses that may be considered indicators of the government's current practice for each component, regardless of the EIA process followed.
- Each table is accompanied by a number of explanatory notes. Also, references to appendices are made throughout the report. The appendices are contained in Volume III. One appendix is devoted to each government. For example, all accompanying materials for British Columbia are located in Volume III, Appendix D; all accompanying materials for the federal government and territories are located in Volume III, Appendix L; similarly, all accompanying materials for Europe are located in Volume III, Appendix Q. The contents of the appendices are intended for illustrative, as well as reference, purposes.
- Upon their request, the Northwest and Yukon Territories do not have tables of their own. Both territories note that their projects most often, if not always, follow the federal Environmental Assessment and Review Process.
- The only province which did not participate in the survey was Alberta. Alberta decided to cooperate in the study by providing a separate report on the role of health in EIA in the province. At the time of writing, the report had not been completed.
- The 'yes' response in the following tables indicates that at least one EIA in the province has included discussion or analysis of the point in question. The 'yes' response is not necessarily an indicator of common practice. That is, it may be the exception rather than the rule.
- Because of the limited input to this report (55 interviews in total), the following tables and discussion may be indicative, but not representative, of how risks to human health are currently addressed in EIA.

## 2.2 Summary of Current Practice In British Columbia

EIA HEALTH ISSUES	British Columbia
<p>EIA mandate</p> <p>Name of policy/legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>EIA is contained in numerous laws, <b>policies</b>, regulations, <b>guidelines</b>, and review <b>practices</b> (e.g., Waste Management Act, Water Act, Environment and Land Use Act, and others) (See Note 2.2.A)</p> <p>Direct references to health are made in many of the above. For example, the Pesticide Control Act, c. 322, defines an "adverse <b>effect</b>" as "an effect that results in damage to man or the environment."</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>Lead agency reviews applications and determines if there are issues which may be of concern to them or other management agencies. If the decision for further <b>review</b> is made, the proposal is referred to other <b>agencies, including</b> when <b>applicable</b>, the Ministry of Health (<b>MOH</b>), and/or public health engineers within the Ministry of Environment and Parks (<b>MEP</b>).</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Many types of development projects, both large and small. One example is the Royal Commission of Inquiry into Uranium Mining (1980). (See Note 2.2.B)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; terms of reference regarding health may be devised for any project with health concerns; depending upon project, terms may be developed in consultation <b>with</b> the proponent, set by MEP, or set in regulations and guidelines (such as standard information requirements) which apply to all cases. (See Note 2.2.C)</p>
<p>Are health professionals involved in the EIA process?</p> <p>Who?</p> <p>When?</p> <p>How?</p>	<p>Yes; depends on the project and level of <b>health</b> concern.</p> <p>Medical Health <b>Officers</b>, Public Health <b>Engineers</b>, among others. The point at which they are involved and the length of their involvement depends on the level of health concern in each case. (See Note 2.2.D)</p>



EIA HEALTH ISSUES	British Columbia
Does the EIA address the following components of an assessment of health risks?	
- Exposure period	Yes; MEP defines it based on the life of the permit. In some cases, the exposure period may be extended beyond the life of the permit. (See Note 2.2.E)
- Area of impingement	Yes; based on resource dispersion (e.g., air sheds, etc.).
- Baseline health study	No
- Impacts to critical subpopulations	No
- Impacts to future generations	No
- Impacts to residents during construction;	Not in generic EIA work, but yes for special health risk industries
- Impacts to workers during construction;	Yes; but only for emergency situations, spills
- Impacts to residents during plant operation;	No
- Impacts to workers during plant operation	No
- An assessment of acute, short-term impacts;	No; only indirectly via impacts on resources that, in turn, may affect humans
- An assessment of chronic, long-term impacts;	No; only indirectly via impacts on resources that, in turn, may affect humans
- An assessment of positive health impacts	No

EIA HEALTH ISSUES	British Columbia
<p>Does the EIA address the following <b>components</b> of an assessment of health risks? (continued)</p>	
<p>- An assessment of cumulative health exposure/effects?</p>	<p>Indirectly; through cumulative effects on resources.</p>
<p>- Impacts to health care facilities</p>	<p>Yes; If the project may affect them.</p>
<p>- Review of existing literature and data</p>	<p>No response</p>
<p>- Development of methods to mitigate health impacts</p>	<p>Yes</p>
<p>- Development of accident scenarios and emergency response procedures</p>	<p>Yes; as required by the nature of the project. The proponent prepares plans for employees and the public. The Provincial Emergency Program reviews the plans and <b>coordinates</b> and <b>assists</b> in their implementation if needed.</p>
<p>- Development of waste disposal procedures</p>	<p>Yes; these are developed through the permit system and include Medical Health Officer's Input.</p>
<p>- Plan for on-going monitoring of health status</p>	<p>No; only indirectly through resource monitoring programs.</p>
<p>Are environmental standards/objectives used in the EIA process health-based?</p>	<p>Yes; health concerns are part of the basis for regulations, guidelines, checklists. The <b>standards/objectives</b> are used in screening applications and as <b>targets for performance</b>.</p>

EIA HEALTH ISSUES	British Columbia
Is the public involved in the health assessment?	Yes
- Discretionary/mandatory	Varies with project type and established review procedures/responsibilities
- Examples of public involvement (list is not all inclusive)	Review and comment on documents; provide input; participate in hearings
- Would intervenor funding be useful?	Yes; if used for small technical working groups, not for public hearing input. Intervenor funding is available under special circumstances (e.g., Uranium mining review)

#### NOTES

2.2.A Some of the mandates are:

- The Energy Project Review Process under the Utilities Commission Act, S.B.C. 1980, c. 60;
- The Guidelines for Linear Development under the Environment and Land Use Act (ELUA), R.S.B.C. 1979, c. 110;
- The Mine Development Review Process under the ELUA; and
- The waste discharge approval process under the Waste Management Act, R.S.B.C. 1979, c. 41, the Environment Management Act, S.B.C. 1981, c. 14, and the Ministry of Environment Act, S.B.C. 1980, c. 30.

2.2.B This Inquiry was conducted to review the potential health and environmental impacts of the industry in general and not of a specific mine site (see Volume III, Appendix D). It was authorized under the Inquiry Act (R.S.B.C. 1979, c. 198; O.I.C. 170, January 1979). A major report was prepared which reviews and discusses many significant health issues. Subjects which are addressed include: exposure to radiation and associated effects on worker and public health, cumulative dose and exposure to radiation, standard-setting to protect worker and public health, mitigation methods to protect the workforce from radiation, and waste management and disposal methods and technologies to handle mill tailings and other possible wastes. Also, the report includes a review of existing literature on animal test data and epidemiological data from mining sites around the world and a discussion of public concerns (which included health and environmental issues) raised at community hearings. Health professionals were integrally involved in the preparation of the report as well as in the conduct of the inquiry.

- 2.2.c Where no terms of reference are established, a review of health and environmental concerns may be conducted “through inspection and **discussion** with responsible agencies.”
- 2.2.D They may be asked to review the application, suggest terms of reference, contribute opinions on issues, or they may be consulted in the final decision to award or not award a permit.
- 2.2.E For example, the exposure period may be extended beyond the life of the **permit** in the case of mines where sealing of **tailings** and shafts and regional **rehabilitation** are necessary.

### 2.3 Summary of Current Practice in Saskatchewan

EIA HEALTH ISSUES	Saskatchewan
<p>EIA mandate</p> <p>Name of policy/legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation</p> <p>The <b>Environmental Assessment Act</b>, Statutes of Saskatchewan, 1979/980, c. E-10.1</p> <p>Direct; see definitions of: "<b>contaminant</b>" - "any substance ... <b>injurious</b> to the health or safety of persons;" and "<b>pollution</b>" - "... alteration of the ... environment ... that ... <b>will</b> render the environment harmful to public health."</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>Project plans are <b>reviewed</b> by a standing Interdepartmental <b>Review Panel (IRP)</b> but no health professional has sat on the panel to date (See Note 2.3.A). Health concerns, therefore, may not be formally "screened" during this <b>review</b> (See Note <b>2.3.B</b>). The <b>final decision</b> is made by the Director, Env. Assessment Branch (<b>EAB</b>), Sask. Env. and Public Safety:</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Waste management projects (e.g., the proposal for a waste management Incinerator at the University of Saskatchewan), Uranium mining projects.</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; If health is an issue, terms of reference regarding health <b>will</b> be included in the <b>project-specific</b> Impact Assessment <b>Guidelines</b> (See Note 2.3.C). Terms are discussed with the proponent and set by the EAB for each project.</p>
<p>Are health professionals involved in the EIA process?</p> <p>Who? When? How?</p>	<p>No; however, steps are underway to instate a health representative on the IRP. They have rarely been consulted during the EIA. Usually, they are involved in a <b>licensing</b> process or in special <b>inquiries</b>. (See Note <b>2.3.D</b>)</p>

EIA HEALTH ISSUES	Saskatchewan
<p>Does the EIA address the following components of an assessment of health risks?</p> <ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>Yes; the exposure period may be based on the estimated length of exposure to pollution.</p>
<ul style="list-style-type: none"> <li>- Area of impingement</li> </ul>	<p>Yes; based on many potential impacts, not just potential health impacts. (See Note 2.3.E)</p>
<ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- impacts to critical subpopulations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- impacts to future generations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> </ul>	<p>Yes; it depends on the type of project, sometimes it is not necessary.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during construction;</li> </ul>	<p>Yes; Dept. of Workplace Health and Safety; (In the Ministry of Human Resources, Labour, and Employment) is on the IRP and will raise this as a concern if necessary.</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during plant operation;</li> </ul>	<p>Yes; If it is an issue.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during plant operation</li> </ul>	<p>Yes; by Workplace Health and Safety.</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term impacts;</li> </ul>	<p>These potential impacts are reviewed directly if they are an issue; they are reviewed indirectly through the assessment of a project's potential effects on environmental resources.</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term impacts;</li> </ul>	
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	

EIA HEALTH ISSUES	Saskatchewan
Does the EIA address the following components of an assessment of health risks? (continued)	
- An assessment of cumulative health exposure/effects?	No; if anything, cumulative effects on resources, not health, may be assessed.
- Impacts to health care facilities	Yes; for projected increases in population and for potential accidents.
- Review of existing literature and data	No response
- Development of methods to mitigate health impacts	Yes; when health is identified as an issue
- Development of accident scenarios and emergency response procedures	Procedures are often developed for the workforce within EIA. Procedures for the surrounding public may be addressed in the EIA if requested in the Guidelines or they may be developed externally with the provincial emergency planning group.
- Development of waste disposal procedures	If raised as an issue, the EIA will address waste disposal; otherwise, waste disposal is usually addressed through permitting procedures.
- Plan for on-going monitoring of health status	No; monitoring of health status is conducted indirectly through the direct monitoring of resource quality.
Are environmental standards/objectives used in the EIA process health-based?	Yes; objectives are partly based on health concerns, e.g., water quality objectives. They may be used to determine the acceptability of EISs and for other purposes.

EIA HEALTH ISSUES	Saskatchewan
Is the <b>public</b> involved in the health assessment?	<b>Yes</b>
- Discretionary/mandatory	Mandatory [Section 11.2(a) of EA Act];
- Examples of public involvement (list is not all inclusive)	Public notice of pending <b>EIA</b> ; public inspection of reports; (See Note <b>2.3.F</b> )
- Would Intervenor funding be useful?	Yes; Intervenor funding is available under Section 6 of the EA Act for preparation and presentation of briefs related to <b>EIAs</b>

### NOTES

2.3.A The following departments and agencies serve on the Panel:

Saskatchewan Environment and Public Safety  
 Human Resources, Labour, and Employment  
 Social Services  
 Parks, Recreation, and Culture  
 Northern Affairs Secretariat  
 Tourism, Small Business, and Cooperatives  
 Energy and Mines  
 Agriculture  
 Rural Development  
 Education  
 Urban Affairs  
 Highways and Transportation  
 Economic Development and Trade  
 Saskatchewan Water Corporation

**2.3.B** However, **steps are underway to secure the involvement of a health ministry representative in the screening process.**

2.3.C For example, in the University of Saskatchewan Proposed Waste Incinerator Environmental Assessment Guidelines, the proponent is directed to "... address the **question** of risks to human health associated with operation of the facility" (see Volume III, Appendix **E**).

2.3.D On occasion, government officials in Saskatchewan Environment and Public Safety have requested special studies to investigate **specific** health concerns. For example, upon the request of Saskatchewan



Environment and Public Safety, an **epidemiologist** in the Department of Health conducted a study of respiratory **illness** in Estevan (see Volume III, Appendix EL). The study compared the level of respiratory illness in a population downwind from an existing power plant in Estevan to the overall level of respiratory illness in the province. Data were obtained from Statistics Canada. While this study was not associated with any EIA, it was requested by the Department of Environment in anticipation of a Saskatchewan Power Corporation proposal to construct a new thermal generating station in Estevan. The results of the study **provided** Saskatchewan Environment and Public Safety with insight into the health status of the relevant population and were used to **determine** whether health was a potential issue for the EIA.

- 2.3.E The area of Impingement is defined as the area potentially affected by the development and may be based on a number of factors, such as a nearby human population, air distribution, and other factors.
- 2.3.F The proponent must document the **public's** concerns regarding the project and must address them in the report. If health is a public concern, **citizens** may raise relevant issues along with other environmental and socio-economic issues. Saskatchewan Environment and Public Safety encourages all project proponents to involve the **public** at appropriate points throughout the process.

## 2.4 Summary of Current Practice In Manitoba

EIA HEALTH ISSUES	Manitoba
<p>EIA mandate</p> <p>Name of policy/legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Cabinet policy</p> <p>Manitoba Environmental Assessment and Review Process (EARP), November 12, 1975. (See Note 2.4.A)</p> <p>Indirect; through expansion of EARP to include health in policy guidelines.</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>Initiating departments screen proposals to determine which ones will be submitted to the Manitoba Environmental Assessment and Review Agency (MEARA). One of the screening criteria relates to potential health effects (see Volume III, Appendix F). Project proposals which are submitted to the MEARA are reviewed by a standing Interdepartmental Planning Board to determine if a proposal is subject to the EARP. (See Note 2.4.B). Health is not represented on the IPB but a health representative may be appointed to the Technical Advisory Committee (TAC). A TAC reviews project reports which are prepared by proponents. The TAC then prepares an IEE and decides if an EIS is needed. If health is a concern, it will be raised by either the IPB or TAC.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Manitoba Hydro generating station; potash mine proposal; transmission line routing. (See Note 2.4.C)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; terms of reference are developed by the TAC in consultation with the proponent. Also, the MEARA has published a general set of EIA Guidelines (1986) to be followed when conducting an EIA; one of the guidelines directly addresses health (see Volume III, Appendix F).</p>

EIA HEALTH ISSUES	Manitoba
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p><b>Yes</b>; whenever health issues arise, they are involved on an as-needed basis. Public health inspection officials of the <b>DOE</b>, environmental health service officials of the Dept. of Health, <b>medical</b> health officers in affected <b>region(s)</b>; they may be involved at <b>any</b> point; they may help establish terms of reference, sit on TAC, participate in special study. (See Note <b>2.4.D</b>)</p>
<p>Does the EIA address the following <b>components</b> of an assessment of health risks?</p> <ul style="list-style-type: none"> <li data-bbox="302 810 574 842">- Exposure period</li> <li data-bbox="302 961 639 993">- Area of impingement</li> <li data-bbox="302 1087 574 1150">- Baseline health study</li> <li data-bbox="302 1245 639 1308">- Impacts to <b>critical</b> subpopulations</li> <li data-bbox="302 1434 607 1497">- Impacts to future <b>generations</b></li> </ul>	<p>Very few, if any, proponents have had to define an exposure period. But the capacity to do so exists.</p> <p>Study area boundaries are based on health as well as other factors.</p> <p>If flagged as an Issue, then a baseline health study would be done; to date, no such study has been done.</p> <p>No; this issues is indirectly examined through identification of users of various resources and collection of data on those resources.</p> <p>No</p>

EIA HEALTH ISSUES	Manitoba
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)</p>	
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> </ul>	<p>Yes; this is usually a qualitative assessment of potential impacts and health care needs.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during construction;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during plant operation;</li> </ul>	<p>Yes; may be either a qualitative or quantitative <b>review</b>.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during plant operation</li> </ul>	<p>Yes; may be either a qualitative or <b>quantitative review</b>.</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- An assessment of <b>cumulative</b> health exposure/effects?</li> </ul>	<p>No; only indirectly through the examination of cumulative effects on resources.</p>
<ul style="list-style-type: none"> <li>- Impacts to health care facilities</li> </ul>	<p>Are addressed for expected increase in demand for health <b>services</b> due to expected increase in population.</p>
<ul style="list-style-type: none"> <li>- Review of existing <b>literature and data</b></li> </ul>	<p>No response</p>
<ul style="list-style-type: none"> <li>- Development of methods to mitigate health impacts</li> </ul>	<p>Yes; proponent must discuss mitigation.</p>

EIA HEALTH ISSUES	Manitoba
<p>Does the EIA address the following <b>components</b> of an assessment of health risks? (continued)</p> <ul style="list-style-type: none"> <li>- Development of accident <b>scenarios</b> and emergency response procedures</li> </ul>	<p>No; this is usually addressed under emergency planning procedures outside of EIA.</p>
<ul style="list-style-type: none"> <li>- Development of waste disposal procedures</li> </ul>	<p>This is generally handled through <b>permitting</b> procedures.</p>
<ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	<p>Yes; some <b>projects</b> require monitoring of health and safety factors. For example, the Manitoba Hydro <b>project</b> and the potash mine both developed and implemented monitoring programs for worker stress and safety and other worker health issues.</p>
<p>Are <b>environmental standards/objectives</b> used in the EIA process health-based?</p>	<p>Yes; standards are developed by the <b>Ministry</b> of Environment's Environmental Control Branch and accepted or rejected by the <b>MOE's</b> Clean Environment Commission. (See Note 2.4.E)</p>
<p>Is the public involved in the health assessment?</p> <ul style="list-style-type: none"> <li>- Discretionary/mandatory</li> <li>- <b>Examples</b> of public involvement (<b>not</b> all <b>inclusive</b>)</li> <li>- Would Intervenor funding be useful?</li> </ul>	<p>Yes</p> <p>Mandatory; the IPB <b>establishes</b> a <b>certain</b> level of public participation for each case. The proponent may do more if desired.</p> <p>Information is made <b>available</b> for general distribution and <b>public</b> comment, <b>public</b> meetings are held, surveys may be conducted.</p> <p>Depends on project type.</p>

NOTES

2.4.A **The** Cabinet policy was replaced **January 1, 1988** by a newly enacted law, The Environment Act (Bill 26). The Environmental Assessment and Review Process has been incorporated into the statute and has been expanded significantly. For example, a number of definitions in the act directly address human health [Section 1(2)]. "Development" means ". . . any project . . . which causes or is likely to cause . . . a **significant** affect on the . . . environmental health and cultural conditions that influence **the lives** of people or a **community**, . . ." "Environmental health" means "... those aspects of human **health** that are or can be affected by pollutants or changes in the environment. . ." Also, "pollutant" means "... any solid, **liquid**, gas . . . that . . . **is** or is likely to be injurious to the health or safety of persons . . ."

Along with other sections of the statute, Section **2(1)** serves to **highlight** the significance of the relationship between the environment and human health:

The aims and objectives of the [Department of Environment and Workplace Safety and Health] are to protect the quality of the environment and environmental health of present and future **generations** of Manitobans and to provide the opportunity for all **citizens** to **exercise** influence over **the** quality of their **living environment**.

2.4.B The IPB **consists** of representatives from the following **departments** and agencies:

**Agriculture**

Manitoba Department of Environment

Highways and Transportation

Natural Resources

Municipal Affairs

Energy and Mines

Cultural Affairs and **Historic Resources**

Economic Development and Tourism

Northern Affairs

**Manitoba** Hydro

**Manitoba** Telephone System

Manitoba Housing and Renewal Corporation

Land **Titles Office**

2.4.C In the transmission line proposal, health was raised as a concern during public consultations, but the issue was not addressed in **detail** in the project EIA. The EIA, however, notes that studies conducted elsewhere suggest that transmission **lines** do not pose a threat to human health.

As in the EIA for the **transmission line**, the EIA for the Manitoba Generating Station did not address health to any great extent, although an appendix to the report discusses the **ability** for health care facilities in the area to absorb any increase in demand expected from the construction and operation of the plant (see Volume III, Appendix F).

**Finally**, the potash mine EIA is said to address **potential** health effects of potash emissions as well as **potential** health effects due to potential changes in ground and surface water quality.

- 2.4.D Both Departments of Health and Community Services were involved in the potash mine and generating station **EIAs** and served on the **TACs**.
- 2.4.E In EIA, proponents consider environmental standards when preparing portions of the EIS. Provincial EIA approval depends on the proponent's ability to mitigate impacts to meet those standards.

## 2.5 Summary of Current Practice in Ontario

EIA/HEALTH ISSUES	Ontario
<p>EIA mandate</p> <p>Name of policy/legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation</p> <p>Environmental Assessment Act, R.S.O. 1980, ch. 141; as amended by 1981, ch. 49 and 1983, ch. 52. (See Note 2.5.A)</p> <p>Indirect; definition of 'environment' includes 'man' (Sec. 1(c)(11)); purpose of act is for 'the betterment of the people' (Sec. 2).</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No screening procedures exist for health <u>per se</u>. To consider health as a potential concern is a standard component of the EIA process. Usually, if health is an issue, it is <b>raised</b> during the Pre-Submission Consultation (PSC). The PSC is a <b>meeting</b> held early in the process to identify issues of concern needing further study. Usually, it is held between the MOE Environmental Assessment Branch and the proponent and Initiating department,</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Landfills, Energy-From-Waste facilities, PCB disposal projects, highways, waste processing (e.g., recycling, shredding, etc.), GO Transit stations, transmission line routing. (See Note 2.5.B)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>If health is a concern, terms of reference <b>will</b> address it; terms are usually developed <b>by</b> the EAB in consultation with the initiating department and proponent during the PSC; for example, for waste management projects, public health and safety are considered mandatory and uniform <b>criteria</b> for all EIAs. Other <b>agencies</b> (e.g., Min. of Health) are allowed to suggest terms of reference.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; Medical Officers of Health, Ministry of Health personnel; they are usually involved during the PSC; they review applications, give opinions on potential impacts, and provide any other assistance needed.</p>



EIA HEALTH ISSUES	Ontario
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health <b>risks</b>?</p>	
<ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>Yes; the exposure period is most often defined by the proponent in consultation with MOE or MOH.</p>
<ul style="list-style-type: none"> <li>- Area of impingement</li> </ul>	<p>Yes; based on a number of factors, including health.</p>
<ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to critical subpopulations</li> </ul>	<p>Depends if <b>sensitive</b> population is in area of impingement. (See Note 2.5.C)</p>
<ul style="list-style-type: none"> <li>- Impacts to future generations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> </ul>	<p><b>Yes; analysis</b> is limited to comments on <b>potential</b> problems; no detailed analyses are conducted.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during construction;</li> </ul>	<p>Yes; the Min. of Labour works to ensure that occupational health and safety requirements are followed.</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during plant operation;</li> </ul>	<p>Yes; analysis is more qualitative than quantitative.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during plant operation</li> </ul>	<p>Yes; the Min. of Labour works to ensure that occupational health and safety requirements are followed.</p>
<ul style="list-style-type: none"> <li>- in <b>assessment</b> of acute, short-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term <b>impacts</b>;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	<p>Yes</p>

EIA HEALTH ISSUES	Ontario
<p>Does the EIA address the following <b>components</b> of an assessment of health risks? (continued)</p>	
<ul style="list-style-type: none"> <li>- An assessment of cumulative health exposure/effects?</li> </ul>	<p>Yes; proponents or initiating departments; are expected to look at cumulative exposures to humans. But the methodology is not well-developed and analysis <b>may</b> be incomplete.</p>
<ul style="list-style-type: none"> <li>- Impacts to health care facilities</li> </ul>	<p>Yes; MOH and Min. of Govt. Services may identify potential impacts to health <b>care facilities as an issue to be addressed.</b></p>
<ul style="list-style-type: none"> <li>- <b>Review</b> of <b>existing</b> literature and data</li> </ul>	<p>Yes; no <b>original studies are conducted.</b> The proponent or Initiating dept. usually relies on the government for access to studies and data.</p>
<ul style="list-style-type: none"> <li>- Development of methods to mitigate health impacts</li> </ul>	<p>Yes; proponent or initiating dept. is expected to consider <b>mitigation options</b> if health impacts are identified.</p>
<ul style="list-style-type: none"> <li>- Development of accident scenarios and emergency response procedures</li> </ul>	<p>Yes; these procedures may be developed as part of a <b>licensing</b> or permitting procedure but may be developed in an EIA. Ontario Hydro and GO Transit, for example, are required to develop these plans in <b>their</b> licensing procedures, not EIA.</p>
<ul style="list-style-type: none"> <li>- Development of waste <b>disposal</b> procedures</li> </ul>	<p>Yes; this is required under the Environmental Protection Act (EPA). Proposed actions must be approvable under the EPA before they can be approved under the Environmental Assessment Act.</p>
<ul style="list-style-type: none"> <li>- Plan for <b>on-going monitoring</b> of health status</li> </ul>	<p>Yes; <b>Ontario</b> Hydro develops procedures for <b>on-going monitoring of worker health.</b> Most often, however, only monitoring of resource quality is conducted.</p>

EIA HEALTH ISSUES	Ontario
Are environmental standards/objectives used in the EIA process health-based?	Yes; they are a mixture of health, natural environment, and technical considerations. (See Note 2.5.D)
is the public involved in the health assessment?	Yes
- Discretionary/mandatory	Mandatory (See Note 2.5.E)
- Examples of public involvement (list is not all inclusive)	Public review of draft EIS and public hearings if they are held. EAB encourages initiating department and proponent to involve the public at appropriate times throughout the process.
- Would Intervenor funding be useful?	Yes; Intervenor funding is currently available for public hearings only

#### NOTES

2.5.A Direct reference to health is made in guidelines. A set of General Guidelines for the Preparation of Environmental Assessments was prepared in 1981 and is currently being updated. It contains "examples of some of the factors to be considered in environmental assessment studies" (see Volume III, Appendix G). Health is listed as one of the factors.

2.5.B The health issues vary according to the type of project. For Ontario Hydro fossil fuel plants, for example, one concern has been the potential health effects from polluted air emissions. Noise and exhaust fumes generated nightly from idling train engines at a proposed GO Transit station caused nearby residents to raise a number of health and safety concerns. Also, **transmission lines** proposed over a schoolyard raised concerns among parents and teachers regarding detrimental health effects to the children in the schoolyard.

Finally, in **landfill** projects, one of the health concerns often raised is the potential disease and illness from **leachate** contamination of drinking water. The EIA for the Brampton landfill site selection process, for example, included one report which was devoted entirely to discussing this and other health and safety concerns associated with landfills and to various mitigation measures (a portion of the report

has been reproduced in Volume III, Appendix G). Chapter 1 of the report discusses generic health and safety considerations such as pathways to human exposure, **public** health and safety concerns associated with site operation, site **closure**, and potential contamination of ground and surface waters, **air pollution**, odour and dust, noise, birds, rodents, Insects, litter, and **traffic**. Chapter 2 **discusses** some **specific** concerns **raised** by the surrounding **community**, and Chapter 3 reviews the site **options** in light of their potential to cause public health and safety problems. Evaluation criteria, **which** include not only public health and safety considerations, but also natural, social, cultural, **economic**, and technical considerations were developed and applied to reduce the number of site **options**. **Public** health and safety criteria received the largest weight factor, indicating the level of importance attached to the issue.

Because of the significant health concerns associated with landfills, Brampton chose to address the concerns in a separate report. Devoting an entire report to health concerns is not typical of all **EIAs** in Ontario. The amount of space devoted to any one issue is decided by the proponent or initiating department.

- 2.5.C Schoolchildren, elderly, Native populations have been identified as critical subpopulations in some projects. Public sector projects generally have not addressed this component; private sector projects such as **EFWS** have.
- 2.5.D The standards and objectives are used in EIA in a number of ways. They may be used to evaluate various alternatives; they may be used at hearings when discussing the ability of a proposed alternative to meet the standards and objectives; and, in addition to other possible uses, they may be included in the conditions for approval.
- 2.5.E In addition to the required public **participation** in reviewing draft **EISs** (as noted in the table), the EAB in the MOE strongly encourages the proponent to involve the public in the preparation of the EIS. The proponent is given the freedom to decide if and how the **public** will be allowed to participate in **this** stage. Such participation may be in the form of holding **public** meetings, forming public liaison groups, and providing input into each stage of the EIA.

## 2.6 Summary of Current Practice In Quebec

EIA HEALTH ISSUES	Quebec
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or Indirect?</p>	<p>Legislation</p> <p>Environmental Quality Act (R.S.Q. 1980, c.2, Division IV.1), Regulations 1 and 9 (See Note 2.6.A)</p> <p>indirect; however, general understanding is that if health is a concern, it will be addressed; an agreement was signed between Ministries of Health and Environment in April 1987 outlining procedure to include MOH in EIA. (See Note 2.6.B)</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No actual screening procedures for health exist; however, the department in charge of the project recommends addressing health if it is a concern; this decision is based on past <b>experience</b>, consultation with <b>Ministry of Health</b>, among other considerations.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Disposal of dangerous goods, aerial spraying of pesticides, hydroelectric power lines, Industrial projects. (See Note 2.6.C)</p>
<p>Are <b>specific</b> terms of reference regarding health set if health is a concern?</p>	<p>Yes; they are established by the Ministry of Environment (<b>MOE</b>) for the proponent and are based on input from the proponent and other government departments such as the Ministry of Health and Social Services. Other <b>parties</b> which may be consulted include private <b>organisations</b>, research groups, Environment Canada.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; but it depends on the project. if health is a concern, they are involved and may include: Department of Health bureau personnel, toxicologists, physicians specializing in environmental health, epidemiologists (See Note 2.6.D). They <b>may</b> be involved throughout project. They provide advice, are consulted on health issues, and may be involved in final decision (See Note 2.6.E).</p>

EIA HEALTH ISSUES	Quebec
<p>Does the EIA address the following components of an assessment of health risks?</p>	
<ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>Yes; based on estimated or measured duration of the effects of exposure. (See Note 2.6.F)</p>
<ul style="list-style-type: none"> <li>- Area of impingement</li> </ul>	<p>Yes; area based on anticipated impacts, including health impacts.</p>
<ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No; however, now that the agreement exists between the Health and Environment Ministries, an increasing number of baseline health studies may be required. Data may be available at the Ministry of and Social Services.</p>
<ul style="list-style-type: none"> <li>- Impacts to critical subpopulations</li> </ul>	<p>Yes; to date, mainly regional groups, such as Indians, have been the focus of this component.</p>
<ul style="list-style-type: none"> <li>- Impacts to future generations</li> </ul>	<p>Yes, primarily through a review of existing literature and past experiences with similar projects; usually no analysis is done.</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during construction;</li> </ul>	<p>Yes (See Note 2.6.G)</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during plant operation;</li> </ul>	<p>Yes, depends on the project (See Note 2.6.H)</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during plant operation</li> </ul>	<p>Yes, depends on the project (See Note 2.6.I)</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	<p>No</p>

EIA HEALTH ISSUES	Quebec
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (<b>continued</b>)</p>	
<p>- An assessment of cumulative health exposure/effects?</p>	<p>Yes; Quebec has a set of procedures for the evaluation of background noise as it may contribute to the <b>concentration</b> of a substance in the environment and to the potential health effects from the <b>cumulative</b> exposure. (See Note 2.6.J)</p>
<p>- Impacts to health care facilities</p>	<p>Yes; due to expected <b>increase</b> in demand for health <b>services</b> from expected increase in <b>population</b>. (See Note 2.6.K)</p>
<p>- <b>Review</b> of existing literature and data</p>	<p>Yes; literature and data based on <b>epi-</b> demiological studies or animal tests have been used. If <b>insufficient infor-</b> mation is <b>available</b>, the proponent may be required to conduct <b>original</b> studies.</p>
<p>- Development of methods to <b>mitigate</b> health impacts</p>	<p>Yes; this is a <b>requirement</b> of the mandate.</p>
<p>- Development of accident scenarios and emergency response procedures</p>	<p>Yes; depending on the type of project, the proponent may be required to develop urgency plans for both employees and the surrounding public.</p>
<p>- Development of waste disposal procedures</p>	<p>Yes; proponent produces a plan which the Ministry of Environment accepts, rejects, or amends.</p>
<p>- Plan for on-going <b>monitoring</b> of health status</p>	<p>Yes; for example, in the case of pesti- <b>cide</b> spraying, employees and the local population have been monitored for exposure and <b>toxicity</b> effects. Also, near the North Central <b>Electric</b> site, mercury levels in Indians eating large <b>quantities</b> of fish are being monitored.</p>

EIA HEALTH ISSUES	Quebec
Are <b>environmental</b> standards/objectives used in the EIA process health-based?	Yes; standards and objectives may be health-based. They are generally adapted from the Environmental Protection Act or federal legislation: from Environment Canada, Agriculture, or Health and Welfare. They are used in EIA as general rules to be adhered to by proponents.
<p>Is the public involved in the health assessment?</p> <p>- <b>Discretionary/mandatory</b></p> <p>- Examples of public involvement (list is not all inclusive)</p> <p>- Would intervenor funding be useful?</p>	<p><b>Yes</b></p> <p>Mandatory</p> <p>The <b>administration</b> procedure includes a phase for public <b>participation</b> which is overseen by a completely independent government office, "Bureau d'Audience Publique." This office is responsible for holding public meetings and gathering information from the public to be considered in the decision-making process. In addition to the public participation organized by this office, the proponent may <b>organize</b> programs for informing and consulting with the public. For example, Hydro Quebec has set up public meetings outside that which is required in an <b>EIA</b>.</p> <p>Yes</p>

#### NOTES

- 2.6.A In Quebec's General Guide for the Environmental Assessment of industrial Projects (May 1987), human health is explicitly listed as a criterion to check when identifying and evaluating potential environmental impacts (see Volume III, Appendix H).
- 2.6.B During the winter and spring of 1986-87, the Ministries of Health and Social Services and Environment met to develop an Interdepartmental agreement on requiring collaboration on subjects affecting both ministries (see Volume III, Appendix H). The agreement was signed April 21, 1987 and states that the two ministries will consult each



other and collaborate on a number of issues, including the preparation and review of **EISs** for projects having potential health impacts.

- 2.6.C Frequently, industrial projects include an **examination** of potential health impacts. For example, an EIS for an Incinerator **project** included a number of sections related to health (see Volume III, Appendix H). The EIS contains an analysis and evaluation of accident risks, an identification and **brief** evaluation of potential health impacts, and an emergency plan.

As one of the **participants** in the survey mentioned, health concerns may not be considered until quite late in an EIA and may be raised only as a result of public outcry or by one of the departments reviewing the EIS. The promulgation of the April 1987 agreement attempts to rectify this so that health issues are identified and integrated into the **EIA** early in the process.

- 2.6.D Others include health professionals from the Ministry of Health and Social Services, Local Centres for Community Health, and the appropriate Regional Centre for Health and Social Services.
- 2.6.E According to the Interdepartmental agreement, the Ministry of Health and Social Services may be involved in the final decision for a project in one of three ways:
1. The Ministers of Health and Social Services and Environment both decide on the project; both must agree.
  2. One Minister makes the decision, the other gives advice and a recommendation.
  3. One Minister decides alone and informs the other Minister of **the decision**.
- 2.6.F For example, the exposure period may be defined as the life of a pesticide or the number of years an incineration plant is expected to be in operation plus the number of years it **will** take to disinfect the plant, that is, the abandonment period. Also, the exposure period may be indefinite; for example, mercury levels in the Indian **population** at James Bay are still being monitored. The proponent usually presents a plan for examining the exposure period but the government must approve the definition and may amend it.
- 2.6.G Examples of types of exposures and effects which may be **examined** include acute toxicity and **chronic** effects from exposure to **pesticides** during handling and also effects from exposure to electromagnetic **fields**.
- 2.6.H Potential exposures and effects which may be examined vary depending on the type of case. Examples include emissions of pollutants into air and water and associated acute and **chronic** effects such as nausea, **loss** of consciousness, cancer risks.

- 2.6. I Same as above.
- 2.6.J Methodologies which exist Include mathematical simulation, **risk** evaluation, and an assessment Of interactions between a proposed project and preexisting ones.
- 2.6.K For example, the Lake Robertson Hydro project on the lower North Coast looked at the effect of an influx of **250** workers In a small area. The proponent was required to set up its own health care facilities so as not to stress the existing infrastructure.

## 2.7 Summary of Current Practice In Newfoundland

EIA HEALTH ISSUES	Newfoundland
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation</p> <p>Environmental Assessment Act, 1980 Environmental Assessment Regulations, 1984 (See Note 2.7.A)</p> <p>Indirect; implied in definition of 'environment' - '(i) plant and animal life, including human life.'</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No screening process for health <u>per se</u>; a seat on the project screening committee is reserved for a member of the health department; to date, however, MOH has rarely attended screening sessions.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Hope Brook gold mine project; Freshwater Offshore Supply Base. (See Note 2.7.B)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>No; health has not been a significant issue because most projects are located in remote areas away from populated centres.</p>
<p>Are health professionals involved in the EIA process?</p> <p>Who?</p> <p>When?</p> <p>How?</p>	<p>Yes; Ministry of Health may be involved in screening committee, but to date, involvement has been limited. However, if the MOH considers it necessary, health professionals may be involved at other points in the process. For example, they may sit on the Department of Environment's Environmental Assessment Committee which is responsible for reviewing EISs.</p>

EIA HEALTH ISSUES	Newfoundland
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks?</p> <p>- Exposure <b>period</b></p>	<p>Yes; the proponent usually defines the exposure <b>period</b> and bases the definition on construction, operation, and abandonment periods.</p>
<p>- Area of Impingement</p>	<p>Yes; but the definition is usually not based on health factors.</p>
<p>- Baseline health study</p>	<p>No; many of the projects are in remote areas.</p>
<p>- Impacts to critical subpopulations</p>	<p>No</p>
<p>- Impacts to future generations</p>	<p><b>No</b></p>
<p>- Impacts to residents during construction;</p> <p>- Impacts to workers during construction;</p> <p>- Impacts to residents during plant operation;</p> <p>- Impacts to workers during <b>plant</b> operation</p>	<p>No</p> <p>Occupational Health and Safety (in the Department of Labour) works to ensure that its regulations are followed.</p> <p>No</p> <p>Occupational Health and Safety works to ensure that its <b>regulations</b> are followed.</p>
<p>- An assessment of acute, short-term impacts;</p>	<p>No</p>
<p>- An assessment of chronic, long-term impacts;</p>	<p>No</p>
<p>- An assessment of positive health impacts</p>	<p>No</p>

EIA HEALTH ISSUES	Newfoundland
<p>Does the EIA address the following components of an assessment of health risks? (continued)</p> <ul style="list-style-type: none"> <li>- An assessment of cumulative health exposure/effects?</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to health care facilities</li> </ul>	<p>Yes; the Hope Brook Gold Mine <b>EIS</b> discussed the potential impact on health care facilities expected from an increase in population.</p>
<ul style="list-style-type: none"> <li>- Review of existing literature and data</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Development of methods to <b>mitigate</b> health impacts</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Development of accident scenarios and emergency response procedures</li> </ul>	<p>Yes; plans are developed for employees.</p>
<ul style="list-style-type: none"> <li>- Development of waste disposal procedures</li> </ul>	<p>Yes; plans are primarily directed toward environmental protection. Procedures <b>are developed through mitigation measures in the EIS and as conditions in Certificates of Approval and permits.</b></p>
<ul style="list-style-type: none"> <li>- <b>Plan</b> for on-going monitoring of health status</li> </ul>	<p>No; monitoring programs exist for wildlife and historic resources but not for human health,</p>
<p>Are environmental standards/objectives used in the <b>EIA</b> process health-based?</p>	<p>Yes; standards are developed from other federal and provincial acts and regulations. One way in which they are used in EIA is in the development of mitigation measures.</p>

EIA HEALTH ISSUES	Newfoundland
Is the public Involved In the health assessment?	Yes; public is Involved in EIA whether or not health is an issue.
- Discretionary/mandatory	Mandatory
- Examples of public involvement (list is not all inclusive)	Public meetings are held; documents are made available for public review and comment; input is sought at almost every stage of the process.
- Would Intervenor funding be useful?	No response

#### NOTES

- 2.7.A Many of Newfoundland's projects are federally supported, In which case they are subject to the federal Environmental Assessment and Review Process (see Section 2.11).
- 2.7.B Very few, if any, projects in Newfoundland have included any sort of health assessment in the EIA. One reason for the lack of attention to health issues is that many projects subject to the EA process are sited in remote areas away from human settlements. Another reason is that people appear to be more concerned with unemployment or with threats to wildlife or fisheries than with threats to human health. Two projects which gave minor consideration to health issues in their **EISs** are the Hope Brook Gold Mine and the Freshwaterbay Offshore Supply Base (Appendix I). The EIS for the Hope Brook Gold Mine briefly discusses the potential impact to nearby health care facilities due to an increase in demand from an influx of people employed by the company. The Freshwaterbay Offshore Supply Base EIS does not discuss public health at all. However, it includes statements of **citizens** made at a public meeting, one of which raises concerns over the potential health risks from hazardous **chemicals** transported to, and **stored at, the base from offshore oil rigs**. The EIS **briefly** discusses plans to ensure adequate medical care to employees who may be injured at the base and emergency response capabilities.

2.8 Summary of Current Practice In New Brunswick

EIA HEALTH ISSUES	New Brunswick
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation</p> <p>Clean Environment Act, Environmental Impact Assessment regulation (effective July 13, 1987)</p> <p>Indirect; <b>implied</b> In definition of 'environment' - '... plant and animal life, <b>including</b> human life...'</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>Project <b>applications</b> are screened by a multidisciplinary team; team may include health professionals If department reviewing <b>application</b> feels it is necessary; no specific criteria <b>exist</b> for screening health impacts.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Addition of a second unit at the Point Lepreau Nuclear Generating Station; <b>regional</b> sanitary landfills; zinc smelter. (See Note 2.8.A)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; projects which undergo an <b>EIA</b> follow <b>issue</b> oriented, project-specific guidelines. These are drafted by <b>Ministry</b> of Municipal Affairs and Environment and are reviewed by the public, government, proponent. If health is a concern, it will be mentioned in these <b>guidelines</b>. (See Note <b>2.8.B</b>)</p>
<p>Are health professionals involved in the EIA process?</p> <p>Who?</p> <p>When?</p> <p>How?</p>	<p>Yes</p> <p>District Medical Health Officers, provincial public health inspectors are involved at any stage as required. They review guidelines, environmental studies, etc.</p>

EIA HEALTH ISSUES	New Brunswick
Does the EIA address the following components of an assessment of health risks?	
- Exposure period	Yes; proponent defines it in consultation with relevant government departments.
- Area of impingement	Yes; proponent defines it in consultation with relevant government departments.
- <b>Baseline</b> health study	Yes; proponent usually relies on available data unless a rigorous study is required.
- Impacts to <b>critical</b> subpopulations	No
- Impacts to future generations	No
- Impacts to residents during construction;	Yes; analysis is primarily qualitative.
- Impacts to workers during construction;	No; in <b>provincial</b> projects this component has not been reviewed. In projects which have been referred to <b>FEARO</b> , such as Lepreau II, worker health during construction was addressed.
- Impacts to residents during plant operation;	Yes
- Impacts to workers during plant operation	Yes
- An assessment of acute, short-term impacts;	No <b>original</b> studies are conducted, but potential health effects have been identified in <b>EIAs</b> and monitored after project is in operation.
- An assessment of <b>chronic</b> , long-term impacts;	
- An assessment of positive health impacts	



EIA HEALTH ISSUES	New Brunswick
Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)	
- An assessment of cumulative health exposure/effects?	Yes; the Lepreau II EIS discusses the combined exposures from the <b>first</b> reactor and the new reactor. (See Note 2.8.C).
- Impacts to health care facilities	Yes; Impacts to health care facilities are considered for major projects only. (See Note <b>2.8.D</b> )
- Review of existing literature and data	Yes; existing literature, which may or may not use animal test or epldemiologi- cal data, is reviewed.
- Development of methods to <b>mitigate</b> health impacts	Yes
- Development of accident scenarios and emergency response procedures	Yes; the Lepreau II EIS is the only project where this was done. It was dealt with in detail primarily through the Atomic Energy Control Board.
- Development of waste disposal procedures	Yes; in the Lepreau II EIS sections were devoted to the discussion of the "Heat Dissipation System," "Radioactive Waste Management," "Inactive Waste Management," among other topics.
- Plan for on-going monitoring of health status	Yes; the Lepreau II EIS contained a <b>sec-</b> tion for "Monitoring of Plant Employees for Radlat Ion Exposures/ For most other projects, monitoring of emissions and exposure levels was considered adequate.

EIA HEALTH ISSUES	New Brunswick
Are environmental standards/objectives used in the EIA process health-based?	<b>Yes</b> ; they are developed based on a number of environmental, economic, and technical factors, including protection of health and human comfort levels. (See Note 2.8.E)
Is the public involved in the health assessment?	<b>Yes</b>
- Discretionary/mandatory	Mandatory
- Examples of public involvement (list is not all inclusive)	Proponent must consult public during the EIA, although nature of consultation is not specified; the province must hold public meetings once government has completed its review of the EIS (See Note 2.8.F)
- Would intervenor funding be useful?	<p><b>Yes</b>; intervenor funding would be useful</p>

#### NOTES

- 2.8.A The level of detail in the health portion of an EIA varies according to the **project** and **level**, of potential and **perceived** health risks. For example, because of the potential water pollution associated with sanitary landfills, New Brunswick requires its proponents to forecast impacts on groundwater **utilized** for human consumption. For the second unit at the Point Lepreau Nuclear Generating Station (see Volume III, Appendix J), which was referred to the Federal Environmental Assessment Review Office (**FEARO**) to be considered under the federal EARP, the proponent identified potential exposures to, and health risks from, radiation, examined the **potential** for accidents, and developed plans according to "Derived Emission Limits" which are health-based standards established by the Atomic Energy Control Board.
- 2.8.B The guidelines for the second unit at the Point Lepreau Nuclear Generating Station contain a number of requirements to study health risks associated with **radiation** exposure, and the EIS reports the results of the studies in such sections as "Radiation Protection of Employees," "Emergency Planning," "**Potential** Health Risks from Radiation Exposure," and "**Monitoring** of Plant Employees for Radiation Exposure. "

- 2.8.C Proponents for other projects are often asked to look at **cumulative** exposures to air pollutants based on a **mathematical** model which determines ground level exposure and uses back trajectory analysis to determine specific source contributions.
- 2.8.D For example, the Lepreau II EIS **discusses** potential impacts to government services such as health care **facilities** due to a **projected** increase in population from increased employment, and due to an increase in illness from normal and accidental discharges.
- 2.8.E These environmental standards and objectives are used as a basis for **preliminary design** objectives in order to **establish** the nature of an undertaking. They are also used to help establish emission **limits**, but limit-setting may be a regulatory rather than EIA condition. For example, in the Lepreau II EIS, "Derived Emission **Limits**" (**DELs**) were discussed for gaseous and liquid **effluents** and for the combined discharges of the first and second reactor. No **DELs** were set but proposed levels were used as **guidelines** for performance.
- 2.8.F In the Lepreau II EIS, for example, the **public** provided input on a number of issues, including concerns regarding their health.

## 2.9 Summary of Current Practice in Nova Scotia

EIA HEALTH ISSUES	Nova Scotia
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health <b>direct</b> or Indirect?</p>	<p>None; project reviews are done on an <u>ad hoc</u> basis; the Environmental Protection Act and the Planning Act contain sections which authorize a request for environmental studies at the <b>discretion</b> of the Minister of Environment. (See Note 2.9.A)</p> <p>The <b>Environmental</b> Protection Act contains definitions which include attention to health.</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No formalized screening procedures or criteria relating to health are in use in Nova Scotia. The need to review potential health impacts is determined on a project-by-project basis during the application review process. If health (public or occupational) or environmental impacts are not <b>identified</b> by the person reviewing the application, they may be identified by the public or interest groups on an <u>ad hoc</u> basis.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Herbicide trial, Uranium <b>inquiry</b> (both are public inquiries and not <b>EIAs</b> in the formal sense). (See Note <b>2.9.B</b>)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>No; health has not been a major issue in Nova Scotia except in the two inquiries noted above. Generally, health issues are "<b>the</b> exception rather than the rule" in Nova Scotia. Specific concerns may be identified during the review process; however, they may not be <b>explicitly</b> addressed, at <b>least</b> in a public fashion.</p>

EIA HEALTH ISSUES	Nova Scotia
<p>Are health professionals involved in the EIA process?</p> <p>Who?</p> <p>When?</p> <p>How?</p>	<p>A health professional is <b>required</b> by law to be a member of the Ministry of Environment's Environmental <b>Control</b> Council which, in <b>addi-</b>tion to other duties, holds <b>public</b> hearings when requested by the <b>Minister</b> of Environment.</p> <p>Not many hearings have been held, and the involvement of health professionals at other points in a review of an <b>application</b> has been limited. Usually, they are involved as a result of public pressure. Even then, however, medical and other health professionals "appear to [be] reluctant to participate."</p>
<p>Does the EIA address the following <b>compo-</b>ponents of an assessment of health risks?</p>	
<p>- Exposure period</p>	<p>Yes; defined from a biophysical point of view only.</p>
<p>- Area of impingement</p>	<p>Yes; defined from a biophysical point of view only.</p>
<p>- Baseline health study</p>	<p>No</p>
<p>- Impacts to <b>critical</b> subpopulations</p>	<p>No; not to date.</p>
<p>- Impacts to future generations</p>	<p>No; however, the public raised this issue at both the Herbicide Trial and Uranium inquiry.</p>
<p>- Impacts to residents during construction;</p> <p>- Impacts to workers during construction;</p> <p>- Impacts to residents during plant operation;</p> <p>- Impacts to workers during plant operation</p>	<p>Not in general; could be looked at by other departments <b>during</b> approval processes.</p>

EIA HEALTH ISSUES	Nova Scotia
Does the EIA address the following components of an assessment of health risks? (continued)	
- An assessment of acute, short-term impacts;	No
- An assessment of chronic, long-term impacts;	No
- An assessment of positive health impacts	No
- An assessment of cumulative health exposure/effects?	No; the boundaries of any review tend to be limited to the actual environment around a project. Long-term or cumulative exposures and effects have not been addressed.
- impacts to health care facilities	Yes; projects in small communities would especially be required to consider impacts to health care facilities.
- Review of existing literature and data	No; very limited reliance, if any, on animal test or epidemiological data. The Uranium Inquiry and Herbicide Trial were the only cases where such data were used.
- Development of methods to mitigate health impacts	Indirectly, through mitigation of environmental impacts (e.g., pollution).
- Development of accident scenarios and emergency response procedures	Yes; proponent and government develop these together. Analysis may be quite limited because the area of impingement may be narrowly defined.

EIA HEALTH ISSUES	Nova Scotia
<ul style="list-style-type: none"> <li>- Development of waste disposal procedures</li> </ul>	<p>Yes; this is done primarily as a requirement of the regulatory process and is not looked at in a public forum. Health is not addressed directly but it is hoped that the project will be operating within acceptable health standards.</p>
<ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	<p>No; not required by regulatory agencies.</p>
<p>Are environmental standards/objectives used in the EIA process health-based?</p>	<p>Yes; Nova Scotia uses standards/objectives which have been developed by other jurisdictions and are based on many factors, including health. Because no formal EIA process exists, standards/objectives are not applied in this capacity. However, the proponent must demonstrate its ability to comply with applicable standards/objectives when applying for a permit.</p>
<p>Is the public involved in the health assessment?</p> <ul style="list-style-type: none"> <li>- Discretionary/mandatory</li> <li>- Examples of public involvement (list is not all inclusive)</li> <li>- Would intervenor funding be useful?</li> </ul>	<p>Yes; when an inquiry is held and health is an issue.</p> <p>This is decided case-by-case.</p> <p>Public inquiries are the primary means of involving the public but to date only a few have been held.</p> <p>Yes; only if a clear policy for EA is developed in Nova Scotia which includes public involvement</p>

#### NOTES

- 2.9.A Section 23(8)(a) of the Environmental Protection Act gives the Minister of the Environment the authority to "require additional plans or other information" when applications for waste discharge permits or mining permits are submitted. The Planning Act (S.N.S., c. 9, 1983, as amended by c. 41, 1985 and c. 51, 1987) contains provisions for

developing municipal or Intermunicipal planning strategies, one of which states that these strategies may contain "requirements for environmental studies to be carried out prior to undertaking specified developments or development in specified areas" [Section 38(2)(f)]. While these are not explicit EIA mandates, the opportunity exists for Nova Scotia to require an investigation of potential environmental impacts.

Many projects in Nova Scotia are federally supported and are, therefore, subject to the federal Environmental Assessment and Review Process (see Section 2.11).

- 2.9.B** Both trials were pre-development inquiries. Although they were not labelled as EIAs, the Inquiries Included assessments of both environmental and short- and long-term health impacts. The Uranium Inquiry proceeded to the provincial Supreme Court where environmental and health Issues were further reviewed.

Other hearings held by the Environmental Control Council (of the Ministry of Environment) which may have included discussion of health Issues, include the Jack Lake Sanitary Landfill, Aylesford Lake Cottage Development, Cobequid Industrial Park, and Tidewater Quarry. In the Tidewater Quarry hearing held in 1984 (see Volume III, Appendix K), the impact of air-borne dust emissions on health, particularly for individuals who suffer from respiratory diseases, was raised as a concern by the public. Although the actual report did not discuss this or other health concerns, it presented numerous stipulations limiting noise and dust levels which may cause environmental and health impacts.



## 2.10 Summary of Current Practice In Prince Edward Island

EIA HEALTH ISSUES	Prince Edward Island
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Cabinet <b>policy</b> as set in Minutes-in-Council (Feb. 1973) directs provincial departments to screen all developments for potentially significant environmental Impacts.</p> <p>No reference to health is made; but any individual (private citizen or government agent) may request that a project be reviewed for potential Impacts through the appeal process of the Land Use Commission as outlined in the Planning Act. (See Note 2.10.A)</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No screening process exists. Each department determines the extent to which it will comply with the Minutes-in-Council from 1973. As such, PEI ministries tend to rely more heavily on the enforcement of health and environmental protection regulations to ensure that human health and the environment are protected rather than on compliance with the <b>Minutes-in-Council</b>.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Building developments, <b>Parkdale</b> Waste incineration Project, asphalt production. (See Note 2.10.B)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Most projects in <b>PEI</b> have some federal support and are subject to the federal Environmental Assessment and Review Process (<b>EARP</b>). PEI participates in the development of terms of reference under EARP. For the few projects <b>which are entirely provincially</b> funded, the Ministry of Community and Cultural Affairs usually identifies issues to be examined (e.g., health, <b>environmental</b> Impacts) and handles each case individually.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; depends on the case. Toxicologists, pathologists, chemists, and others from the Department of Health are involved when needed for consultation and advice. (See Note 2.10.C)</p>

EIA HEALTH ISSUES	Prince Edward Island
<p>Does the EIA address the following components of an assessment of health risks?</p> <ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>(See Not8 2.10.D)</p> <p>Yes; government defines It based on specific characteristics of project.</p>
<ul style="list-style-type: none"> <li>- Area of Impingement</li> </ul>	<p>Yes; defined according to impacts on environment.</p>
<ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to critical subpopulations</li> </ul>	<p>Yes; usually the Department of Health or Community and Cultural Affairs reviews existing literature for this information.</p>
<ul style="list-style-type: none"> <li>- Impacts to future generations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> <li>- Impacts to workers during construction;</li> <li>- Impacts to residents during plant operation;</li> <li>- Impacts to workers during plant operation</li> </ul>	<p>No; to date, these have not been applicable.</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term impacts;</li> <li>- An assessment of chronic, long-term impacts;</li> <li>- An assessment of positive health impacts</li> </ul>	<p>No; to date, these have not been applicable.</p>

EIA HEALTH ISSUES	Prince Edward Island
Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)	
- An assessment of cumulative health exposure/effects?	Yes; but this is often a <b>minor</b> issue as many <b>provincial</b> projects are small in nature.
- Impacts to health care facilities	<b>No</b> ; to date, has not been <b>applicable</b> .
- <b>Review</b> of existing literature and data	Depends on the specific project.
- Development of methods to mitigate health impacts	<b>No</b> ; some proactive mitigation may occur through permitting procedures but often mitigation occurs after impacts have been experienced.
- Development of accident scenarios and emergency response procedures	Yes; depends on the project.
- Development of waste disposal procedures	Yes; this is a required part of the permitting procedures.
- Plan <b>for</b> on-going monitoring of health status	Monitoring of environmental (rarely health) effects is conducted by the province, <b>not</b> the proponent.
Are environmental standards/ <b>objectives</b> used in the EIA process health-based?	Yes; the province uses national and other provincial standards/objectives which are based on many factors, <b>includ-</b> ing health.

EIA HEALTH ISSUES	Prince Edward Island
Is the public Involved In the health assessment?	<b>Yes;</b> It Is common practice to Involve public, but not just for health concerns
- Discretionary/mandatory	<b>Discretionary</b>
- Examples of <b>public</b> involvement (list Is not all Inclusive)	The public may review documents and raise concerns at <b>public</b> Information meetings. If an appeal Is requested, a public hearing may be held.
- Would Intervenor funding be useful?	No

#### NOTES

- 2.10.A Many projects In PEI are small and are not **reviewed** for potential Impacts to any great extent. Also, many larger projects In PEI are partially funded by the federal government and are, therefore, subject to the federal Environmental Assessment and Review Process (see Section 2.11).
- 2.10.B The government conducted a **limited** examination of health Issues related to **emissions** from the **Parkdale** Waste incineration Project.
- 2.10.C Sometimes, however, they may have a more central role **if** the Issue has received significant **public** attention. For example, a **toxicologist** from Ottawa was Involved In the review of the proposed **Parkdale** Waste Incineration Project.
- 2.10.D When an application Is reviewed in more detail, the government rather than the proponent usually conducts the review and requests the proponent to provide Input when necessary.

## 2.11 Summary of Current Practice In the Federal Government and Territories

### 2.11.A General Overview

The federal Environmental Assessment and Review Process (EARP) is administered at the federal level of government and in the Northwest and Yukon Territories. In both territories, EARP is usually administered by the initiating federal department rather than the territorial governments. The territories provide input into the federal process routinely and are involved in making key decisions. Also, both territories have Water Boards which hold hearings (in addition to EARP hearings) for projects needing water licenses.

This section contains five tables. The table below provides a general introduction to the federal EARP. The subsequent tables provide examples of how the EARP is implemented in four federal departments -- Canadian Oil and Gas Lands Administration (COGLA), Department of Energy, Mines, and Resources (EMR), the Indian Environmental Protection Branch (IEP) of the Department of Indian Affairs and Northern Development (DIAND), and the Northern Environmental Protection Branch (NEP) of DIAND.

EIA HEALTH ISSUES	Federal Government and Territories
EIA mandate  Name of policy/ legislation  Is the reference to health direct or indirect?	Cabinet policy  Federal Environmental Assessment and Review Process under the Government Organization Act (S.O.R. 84-467), 1984 (See Note 2.11.A)  Indirect; Implied in use of term "environmen- tal consequences."
What is the process followed to screen potential health concerns?	Each initiating department has its own screen- ing procedures which may or may not contain health criteria (See Note 2.11.B). A depart- ment may also use the Federal Environmental Assessment and Review Office (FEARO) screening matrices. (See Note 2.11.C)
What are types of projects that have addressed health issues in the EIA?	Uranium refineries, nuclear power plants, hydrocarbon production and transportation, military flying operations, and others. (See Note 2.11.D).

EIA HEALTH ISSUES	Federal Government and Territories
<p>Are <b>specific</b> terms of reference regarding health set if health is a concern?</p>	<p><b>Yes</b>; If an IEE is required, the initiating department sets them with input from other agencies; if an EIS is required and it is referred to <b>FEARO</b>, a <b>Panel</b> is appointed which sets terms of reference. When health is a concern, <b>specific</b> terms of reference are set to address relevant issues. (See Note 2.11.E)</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; depends on each case.            Medical doctors, health physicists, <b>toxicologists</b>, and others from Health and Welfare Canada are involved at the point at which <b>it is</b> decided health is an issue. They may provide advice and <b>professional opinions</b>, review documents, give testimony, etc. (See Note 2.11.F)</p>
<p>Are <b>environmental standards</b> and objectives used in the EIA process health-based?</p>	<p>Yes; many national environmental standards and objectives are in part health-based and are developed by Environment Canada, Health and Welfare Canada, and other agencies. Most often they are used as targets for performance and compliance. (See Note 2.11.G)</p>
<p>is the public involved in the health <b>assessment</b>?</p> <ul style="list-style-type: none"> <li>- Discretionary/</li> <li>- <b>Examples of public involvement (list is not all inclusive)</b></li> <li>- Would <b>intervenor</b> funding be useful?</li> </ul>	<p>Yes</p> <p>Mandatory in preparation of <b>EISs</b>; discretionary in preparation of <b>IEEs</b>. (See Note 2.11.H)</p> <p>Public <b>is</b> not involved in screening phase; but <b>is</b> allowed to see results of departmental screening. Public <b>is</b> consulted for some <b>IEEs</b>; and all <b>EISs</b>; public meetings and hearings are held for <b>EISs</b>, public review of documents is required. (See Note 2.11.I)</p> <p>Yes</p>

### 2.11.B Canadian Oil and Gas Lands Administration (COGLA)

COGLA's EIA projects are mainly offshore oil rigs so potential public health risks are minimal, if at all existent. COGLA is primarily concerned with worker health.

EIA HEALTH ISSUES	Federal Government and Territories
Does the EIA address the following components of an assessment of health risks?	
- Exposure period	Yes; COGLA defines It based on the <b>projected</b> duration of an activity.
- Area of Imp l ngement	Yes; COGLA defines It based on environmental and socio-economic factors, usually not health.
- Base l ne health study	No
- Impacts to critical subpopulations	No
- Impacts to future generations	No
- Impacts to residents <b>during</b> construction;	No
- Impacts to workers during construction;	No
- <b>Impacts to</b> residents during plant operation;	No
- <b>Impacts to</b> workers during plant operation	Yes; <b>qualitative</b> analysis only. <b>Occupational</b> Health and Safety (In the Ministry of Labour) and COGLA worked together to develop a set of regulations to govern the operation of a rig and protect worker health and safety.

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)</p>	
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term Impacts;</li> </ul>	<p>Yes; for health of workers.</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term Impacts;</li> </ul>	<p>Yes; for health of workers.</p>
<ul style="list-style-type: none"> <li>- An assessment of <b>positive</b> health Impacts</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- An assessment of cumulative health exposure/effects?</li> </ul>	<p>No; very little Industrial activity exists near sites to warrant such a study.</p>
<ul style="list-style-type: none"> <li>- Impacts to health care facilities</li> </ul>	<p><b>Yes</b>; Impacts to health care facilities due to an expected increase in population are examined for big projects, <b>not</b> for exploration sites.</p>
<ul style="list-style-type: none"> <li>- Review of existing <b>literature</b> and data</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Development of methods to mitigate health impacts</li> </ul>	<p><b>Yes</b>; If identified potential impacts pose a health risk, <b>mitigation</b> methods would be considered.</p>
<ul style="list-style-type: none"> <li>- Development of accident <b>scenarios</b> and emergency <b>response</b> procedures</li> </ul>	<p>Yes; contingency plans are developed for employees, but not for the <b>public</b>.</p>
<ul style="list-style-type: none"> <li>- <b>Development of waste disposal procedures</b></li> </ul>	<p>Yes; waste treatment and disposal guidelines are developed.</p>
<ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	<p>No</p>



### 2.11.C Department of Energy, Mines, and Resources (EMR)

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the EIA address the following components of an assessment of health risks?</p> <ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>Yes; EMR usually defines exposure <b>period</b> in <b>relation</b> to existing environmental standards and bases it on the length of time people may be exposed to a substance.</p>
<ul style="list-style-type: none"> <li>- Area of impingement</li> </ul>	<p>Yes; EMR usually bases it on prevailing winds and exhaust emissions.</p>
<ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No; EMR does not review baseline health at the screening level but may look at it if project is referred to FEARO. To date, this <b>has</b> not been done.</p>
<ul style="list-style-type: none"> <li>- Impacts to critical subpopulations</li> </ul>	<p>Yes; if <b>potential</b> health impacts <b>exist</b>, impacts to critical subpopulations would be <b>reviewed</b>. This would be identified and addressed during the screening phase.</p>
<ul style="list-style-type: none"> <li>- Impacts to future generations</li> </ul>	<p>Yes; for example, based on previous <b>experience</b> and theoretical computer modelling; EMR would screen potential radiological impacts on future generations.</p>
<ul style="list-style-type: none"> <li>- Impacts to residents during construction;</li> </ul>	<p><b>Yes</b>; impacts would be identified and considered in a qualitative assessment.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during construction;</li> </ul>	<p>Yes; same as above.</p>
<ul style="list-style-type: none"> <li>- Impacts to <b>residents</b> during plant operation;</li> </ul>	<p>Yes; same as above.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers <b>during</b> plant operation</li> </ul>	<p>Yes; same as above.</p>

EIA HEALTH ISSUES	Federal Government and Territories
Does the EIA address the following components of an assessment of health risks? (continued)	
- An assessment of acute, short-term impacts;	Yes; qualitative <b>discussion</b> only.
- An assessment of chronic, long-term impacts;	Yes; qualitative <b>discussion</b> only.
- An assessment of positive health impacts	Yes; <b>qualitative</b> discussion only.
- An assessment of cumulative health exposure/effects?	Yes; however, no procedures <b>exist</b> . The analysis would be conducted case-by-case and is usually qualitative. (See Note 2.11.J)
- Impacts to health care facilities	Yes; EMR may <b>review</b> the potential effect on health care <b>facilities</b> due to an <b>expected</b> increase in population.
- Review of existing literature and data	No; If EMR has a specific concern, it would consult Health and Welfare Canada.
- Development of methods to mitigate health impacts	Yes
- Development of accident scenarios and emergency response procedures	No; these are usually developed through permitting procedures. They are not addressed in the screening phase but if an IEE or EIS is required, they are usually mentioned in the reports.
- Development of waste disposal procedures	<b>Yes</b>

EIA HEALTH ISSUES	Federal Government and Territories
<ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	No; <b>indirectly</b> through other monitoring. For example, In the home renovation projects for Native bands (see Screening report in Volume III, Appendix L) indoor air emissions and air quality are <b>monitored</b> and measurements are compared with health-based standards.

**2.11. Indian Environmental Protection Branch (IEP) of DIAND**

IEP is primarily responsible for Native communities in southern Canada (south of 60). These are primarily reserve bands and the projects are usually capital projects such as sewage works, roads, drinking water systems, and others. The projects and **associated** health risks are considered small. Screening proposals, rather than requiring **IEEs or EISs**, is usually considered sufficient.

EIA HEALTH ISSUES	Federal Government and Territories
Does the EIA address the following components of an assessment of health risks?  <ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	No; very few <b>EIAs</b> have been conducted in IEP. To date, this component has not been addressed.
<ul style="list-style-type: none"> <li>- Area of Impingement</li> </ul>	No; same as above.
<ul style="list-style-type: none"> <li>- <b>Baseline</b> health study</li> </ul>	No
<ul style="list-style-type: none"> <li>- Impacts to <b>critical</b> subpopulations</li> </ul>	Yes; this component is Inherent in <b>all</b> screening because the populations which may be affected are Native.

EIA HEALTH ISSUES.	Federal Government and Territories
Does the EIA address the following components of an assessment of health risks? (continued)	
- Impacts to future generations	No
- Impacts to residents during construction;	Yes; both construction and operation phases are <b>reviewed</b> for potential impacts. But due to the nature of projects (e.g., sewage works for <b>reservations</b> , roads, etc.), potential negative impacts are considered insignificant.
- Impacts to workers during construction;	Yes; same as above.
- Impacts to residents during plant operation;	Yes; same as above.
- Impacts to workers during plant operation	<b>Yes</b> ; same as above.
- An assessment of acute, short-term impacts;	Yes
- An assessment of chronic, long-term impacts;	Yes
- An assessment of positive health impacts	No response
- An assessment of cumulative health exposure/effects?	Not applicable because projects are <b>often</b> small and located on <b>reservations</b> where little development has occurred.
- Impacts to health care facilities	Yes; but only in a general sense
- Review of existing literature and data	No; considered not applicable because of the minor nature of projects.

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the EIA address the following components of an <b>assessment of health risks</b>? (continued)</p>	
<p>- Development of methods to <b>mitigate</b> health impacts</p>	<p>Yes; It is standard practice to mitigate health impacts.</p>
<p>- Development of accident <b>scenarios</b> and emergency response procedures</p>	<p>Yes; If necessary. IEP would develop emergency procedures for employees and the public if a potential for an <b>emergency situation exists</b>.</p>
<p>- Development of waste disposal procedures</p>	<p>Yes</p>
<p>- Plan for on-going monitoring of health status</p>	<p>No</p>

2.11.E Northern Environmental Protection Branch (NEP) of DIAND

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the <b>EIA</b> address the following components of an assessment of health risks?</p>	
<p>- Exposure <b>period</b></p>	<p>Yes; if applicable. For example, in Uranium mining proposals, the <b>Atomic Energy Control Board</b> would <b>define</b> the exposure period.</p>
<p>- Area of impingement</p>	<p>Yes; <b>definition</b> is based on an appropriate measure.</p>

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)</p> <ul style="list-style-type: none"> <li>- Baseline health study</li> </ul>	<p>No; NEP does not collect its own data. If needed, NEP would refer to Health and Welfare Canada statistics which are <b>col-</b> lected routinely to determine if an <b>ano-</b> mai exists.</p>
<ul style="list-style-type: none"> <li>- impacts to critical subpopulations</li> </ul>	<p>Yes; Native populations are considered a critical subpopulation. What is <b>accep-</b> table for the average Canadian may not <b>be</b> acceptable for a Native person because of differences in diet and lifestyle.</p>
<ul style="list-style-type: none"> <li>- impacts to future generations</li> </ul>	<p>Yes; NEP does not conduct its own studies; it consults with Health and Welfare Canada.</p>
<ul style="list-style-type: none"> <li>- impacts to residents during construction;</li> </ul>	<p>Yes; potentlai exposures and health effects are examined based on comparison with Health and Welfare statistics.</p>
<ul style="list-style-type: none"> <li>- impacts to workers during construction;</li> </ul>	<p>Yes; potential exposures and health effects are examined based on comparison <b>with</b> Occupational Health and Safety (Min. of Labour) statistics.</p>
<ul style="list-style-type: none"> <li>- impacts to residents during plant operation;</li> </ul>	<p>Yes; the assessment is purely a qualita- tive review.</p>
<ul style="list-style-type: none"> <li>- Impacts to workers during plant operation</li> </ul>	<p>Yes; the assessment is purely a qualita- tive review.</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term Impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term impacts;</li> </ul>	<p>Yes</p>
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	<p>No</p>

EIA HEALTH ISSUES	Federal Government and Territories
<p>Does the EIA address the following components of an assessment of health risks? (continued)</p>	
<p>- An assessment of cumulative health exposure/effects?</p>	<p>Yes; each case is assessed differently; NEP is only beginning to look at the broader picture to include health in the assessment of cumulative environmental effects.</p>
<p>- Impacts to health care facilities</p>	<p>Yes; due to an increase in population and from potential illness due to normal discharges.</p>
<p>- Review of existing literature and data</p>	<p>Yes; NEP relies on Health and Welfare Canada for information and assumes that Health and Welfare Canada relies on existing and original studies.</p>
<p>- Development of methods to mitigate health impacts</p>	<p>Yes</p>
<p>- Development of accident scenarios and emergency response procedures</p>	<p>Yes; developed for employees but not public because projects often are located away from communities and do not pose a threat to them.</p>
<p>- Development of waste disposal procedures</p>	<p>Yes</p>
<p>- Plan for on-going monitoring of health status</p>	<p>No; however, any monitoring program may be altered at any time. Currently, health is monitored indirectly through monitoring compliance with Health and Welfare Canada standards.</p>

NOTES

- 2.11.A The federal Environmental Assessment and **Review Process (EARP)** was **established** by federal Cabinet **policy** in 1973 and amended in 1977. In 1984, the federal EARP was strengthened and updated in an **Order-in-Council** under the Government **Organization Act (S.O.R. 84-467)**. No direct reference to health is made in the policy. However, it is currently under **review** for further improvement. A Cabinet memorandum has been drafted and proposes a number of changes. It has been distributed to several agencies for review and comment. Based on the responses received, the Federal Environmental Assessment **Review Office (FEARO)**, the agency responsible for **policy** development and for overseeing the **administration** of the **EARP**, wrote a Green Paper for further discussion. Health is being explicitly included in the Green Paper so that no doubt remains about the importance of addressing human health issues in **EIAs**.
- 2.11 .B For example, the procedures for the Northern Environmental Protection Branch in the Department of Indian **Affairs** and Northern Development (**DIAND**) use FEARO's screening matrices which do not mention human health. The screening procedures for the Department of Energy, Mines, and Resources (**EMR**), on the other hand, list "health and safety" as a criterion to be considered when screening proposals for potential environmental impacts.
- 2.11.C Many agencies and ministries have developed **their** own set of screening procedures and agency-specific criteria, based on **FEARO's** screening **publications**, the Guide for Environmental Screening (1979) and the Initial Assessment Guide (1986). Although the 1979 publication contains no reference to human health as an **essential** screening criterion, Appendix 1 in the 1986 publication discusses "additional considerations to aid initial assessment." One of the considerations included under "**social-economic measures**" is "... biophysical impacts which affect residents and users of resources. Examples include impacts on atmosphere, **soil** and water resources, fish habitat, and populations of sport and commercial fish species." Although human health is not explicitly named, it may be inferred from this category as an important consideration.
- 2.11.D Most **projects** that are screened are not required to prepare an **IEE** or **EIS**. The screening reports are brief accounts of potential environmental concerns and the **significance** of those concerns. These reports may or may not address health, depending on the nature of the project. Two examples of screening reports from **EMR** are included in Volume III, Appendix L. Both mention health as a possible concern but discount it as not significant enough to warrant preparation of an **IEE** or **EIS**. One of the reports is for firewood cutting and **utilization** in Quebec and mentions the potential health and safety risk to residents given a large-scale conversion from heating oil to firewood as a fuel source. The other report screens potential impacts caused by the



construction of energy-efficient **housing** in the Yukon Territory. The health risk raised here is the potential air quality problem inside energy-efficient houses due to **insufficient** ventilation.

Of the projects that are screened, very few **IEEs** and even fewer **EISs** are required. When an EIS is prepared, FEARO establishes an Environmental Assessment Panel to conduct **public** hearings and write a panel report with recommendations. The **initiating** department ensures that the EIS is prepared, which serves as the basis for the hearings. Examples of **projects** for **which EISs** have been prepared and which have included health concerns are **listed** below:

<u>Project</u>	<u>Health Concerns</u>
Hibernia Offshore Oil Rig Development Project	Safety of workers on oil rig
Eldorado Uranium Refinery in Saskatchewan	Public and worker health and safety
<b>Beaufort</b> Sea Hydrocarbon Production and Transportation Project	Employee health and safety
Second Reactor at the Lepreau Nuclear Power Plant	Radiation effects on human health
Military Flying Operations at Goose Bay, Labrador	Health effects of low-flying <b>aircraft</b> on populations

2.11.E For example, the terms of reference for the review of military flying operations based at Goose Bay, Labrador, refer to health. The terms state that, "The **[FEARO]** Panel will also review the public health effects of low flying aircraft on the affected populations in the region" (see Volume III, Appendix L).

2.11.F When developing opinions and reviewing **EISs** for **projects**, health professionals **have** been known to address such issues as impacts to critical subpopulations and future generations, acute and chronic impacts to **public** and employee health, **cumulative** exposures, mitigation methods, waste disposal methods, and emergency response procedures. Rarely do they conduct original studies for an EIA. Rather, they often rely on the existing **literature** and data and **their** past experiences and professional judgment to form the basis of their opinions. While they do not **organize** their own public information programs, they take advantage of **FEARO's public participation** efforts to meet with the public and identify the public health concerns.

Health and Welfare Canada is involved in a number of planning and assessment procedures in addition to EIA. For example, Health and Welfare Canada assists Agriculture Canada in evaluating the effects of

**pesticides** on workers and the general population through a number of different exposure pathways (e.g., **skin contact, pesticide** residues in food, **accidental** exposures, etc.). **Also**, Health and Welfare Canada **assists** Labour Canada in **developing** workplace health and safety **regulations** and standards, and Health and Welfare Canada assists Environment Canada in evaluating new chemicals for potential health risks before they are placed on the market. Each of these assessment procedures may have useful **methodologies** and techniques for application in the health portion of EIA.

- 2.11.G Some agencies develop regulatory standards which are project-specific. For example, COGLA and Occupational Health and Safety have collaborated on a set of regulations for oil and gas development projects. These regulations, in addition to non-health related regulations, provide noise standards, building safety codes, emergency response procedures, and mitigation and protective measures to safeguard employee health. They are applied not only in the construction and operation of oil rigs but also in the planning and environmental assessment of proposed rigs as criteria for evaluation and decision-making.
- 2.11.H Most projects at EMR and COGLA, for example, are subject to thorough screening which is often deemed sufficient. **IEEs** are prepared when an important question exists but only a few projects have been required to prepare an **EIS**. If an IEE or EIS is prepared, the public **will** be consulted.
- 2.11.1 The degree of **public** involvement varies. For example, in both Territories, hearings are usually held either at the **territorial** or federal level of government. Also, agencies may hold public meetings or organize working groups, and they are required to make documentation available for public review and comment. If a **project** is referred to FEARO, FEARO **will** establish a panel **which will** hold a set of public hearings. To date, **public** concerns have not been health-related. When health is a concern, however, the public has a number of opportunities to **raise** and **discuss** relevant issues.
- 2.11 .J For example, for wood-burning stoves, EMR would consider the potential cumulative number of people that may be using the technology and the potential cumulative exposure and effects on health.

## 2.12 Summary of Current Practice the United States

EIA HEALTH ISSUES	United States
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation and implementing regulations</p> <p>National Environmental Policy Act (NEPA), Title 40, Code of Federal Regulations (CFR), Sections 1500-1508</p> <p>Direct; In the definition of 'effects,' Section 1508.8 (40 CFR): "... ecological . . . , aesthetic, historical, cultural, economic, social, or health, whether direct, indirect, or cumulative . . ."</p> <p>(See Note 2.12.A)</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>The initiating department screens proposals to determine if an IEE or EIS is needed. Some agencies review each proposal on a case-by-case basis. Others may have checklists; health may or may not be a criterion on them.</p> <p>(See Note 2.12.8)</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Nuclear plant projects (siting, decommissioning), chemical weapon demilitarization, pesticide activities, sewage and solid waste management projects. (See Note 2.12.C)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; these are developed during the scoping phase where the initiating department, proponent, the public, local and state agencies, and other federal agencies, including the Environmental Protection Agency (EPA) suggest issues (such as health) which warrant further study. These issues are then set in terms of reference. Minimum requirements may also be set in individual agency's regulations for implementing NEPA.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; depends on each case. Toxicologists, public health professionals, Ph.D.'s in medicinal chemistry, microbiologists, epidemiologists, and others may be involved in scoping phase, in preparation of report as technical advisors, as writers of relevant portions of report, reviewers of drafts;</p>

EIA HEALTH ISSUES	United States
Does the EIA address the following components of an assessment of health risks?	
- Exposure period	Yes; basis for establishing exposure <b>period</b> varies depending on case. (See Note 2.12.D)
- Area of Impingement	Yes; differs in each case; based on many factors, including health. (See Note 2.12.E)
- <b>Baseline</b> health study	No; on a case-by-case basis, this <b>information</b> may be relevant to a decision. A complete study to determine baseline health status has never been conducted as part of an EIA. (See Note 2.12.F)
- Impacts to critical subpopulations	Yes; <b>critical</b> subpopulations may be <b>identified</b> during scoping phase depending on the situation. (See Note 2.12.G)
- Impacts to future generations	Yes; proponent or Initiating department relies on completed studies to examine toxicity, <b>carcinogenicity</b> , mutagenicity, and teratogenicity.
- Impacts to residents during construction;	Yes; various exposures and health effects may be identified and examined, depending on the nature of the project. The analysis is generally conducted to the extent needed to define appropriate <b>mitigation</b> measures.
- Impacts to workers during construction;	Yes; this analysis may be <b>limited</b> because <b>itis</b> generally handled through the Occupational Safety and Health Administration ( <b>OSHA</b> ).
- Impacts to residents during plant operation;	Yes; <b>similarly</b> handled as <b>described</b> above: not only for plants in operation but also for on-going projects such as <b>pesticide</b> activities.

EIA HEALTH ISSUES	United States
Does the EIA address the following components of an assessment of health risks? (continued)	
- Impacts to workers during plant operation	Yes; same as above. Generally handled through OSHA.
- An assessment of acute, short-term impacts;	Yes
- An assessment of chronic, long-term impacts;	Yes
- An assessment of positive health impacts	Yes; e.g., positive health benefits from <b>establishing sewage treatment.</b>
- An assessment of cumulative health exposure/effects?	Yes; depends on <b>project.</b> The analysis is often qualitative in nature as no procedures regarding the measurement of <b>cumulative exposures exist.</b>
- Impacts to health care facilities	Yes; depends on project, but may be a licensing requirement and not an EIS requirement. (See Note 2.12.H)
- Review of existing literature and data	Yes; studies are <b>reviewed</b> to help identify potential health effects.
- <b>Development of methods to mitigate</b> health impacts	Yes; where health and other impacts are identified, mitigation measures must be discussed.
- Development of accident <b>scenarios</b> and emergency response procedures	Yes; <b>accidentscenarios</b> and emergency response plans have been developed for a number of projects but this may or may not be an EIA requirement.
- Development of waste <b>disposal</b> procedures	Yes; these procedures are most often developed as a requirement of another process, not EIA. (See Note 2.12.I)

EIA HEALTH ISSUES	United States
<p>Does the EIA address the following components of an assessment of health risks? (continued)</p> <ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	<p>Yes; depends on project; It may be part of permitting procedures and/or EIS. Usually employee health may be monitored, not public health.</p>
<p>Are environmental standards/objectives used in the EIA process health-based?</p>	<p>Yes; they are based in part on health factors. (See Note 2.12.J)</p>
<p>Is the public involved in the health assessment?</p> <ul style="list-style-type: none"> <li>- Discretionary/mandatory</li> <li>- Examples of public involvement (list is not all inclusive)</li> <li>- Would intervenor funding be useful?</li> </ul>	<p>Yes</p> <p>Minimum requirements are mandatory; otherwise, <b>discretionary</b>.</p> <p>Allow <b>public</b> to review documents, hold public hearing if controversial issue or if requested, gather appropriate information from public, notify public where to get updates.</p> <p>No response</p>

#### NOTES

2.12.A In addition to the general set of regulations outlining the EIA process and content, each federal agency has promulgated its own set of implementing regulations, detailing agency-specific procedures for conducting an EIA and elaborating on the content of an EIS. Some agencies directly require the examination of potential health effects of proposed projects. For example, the implementing regulations for the Food and Drug Administration in Health and Human Services (Federal Register Vol. 50, No. 81) state that the applicant must "... use any relevant toxicological data or other appropriate measures to predict,

to the extent **applicable**, effects on animals, Plants, humans, other organisms ..." Other regulations, such as those for the U.S. Forest **Service** and the U.S. Department of Agriculture, adopt the terms in the general set of regulations (**40 CFR Sections 1500-1508**), including the definition of "effects" and thereby implying the requirement to examine potential health effects.

The Environmental Protection Agency (US EPA), the agency **responsible** for **administering** NEPA, has developed a set of Environmental Impact Guidelines for New Sources. These **guidelines** are industry-specific, providing proponents with guidance on the type of information to include in an EIS and presenting the impact assessment considerations that are **characteristic** of each industry. Some **contain explicit** remarks on health considerations, others do not. For example, the guidelines for New Source Underground Coal Mines and Coal Cleaning Facilities (1981) review human health impacts generally associated with coal mine and coal **cleaning** wastes. While the discussion is not **all-inclusive** (i.e., it addresses health **considerations** associated with industry wastes but not with industry operations such as long-term exposure to coal dust particles which may cause black lung disease), it provides the reader with an account of the **public** health issues to address and the types of mitigation and pollution control measures to adopt to minimize adverse health impacts. Likewise, the guidelines for New Source Phosphate Fertilizer Manufacturing Facilities (1981) discuss potential human health impacts from and mitigation measures for its industry wastes. Other guidelines, such as those for New Source Leather Tanning and Finishing Industries (1980) do not discuss specific human health impacts but recommend that:

company **policy** should provide and maintain safe and healthful **conditions** for employees and establish operating practices that **will** result in safe working conditions and efficient operations. All proposed plans to **maximize** health and safety should be described in the **EID** (environmental impact document).

In addition to providing industry-specific information, each set of **guidelines** lists other government agencies which have legislation and regulations **affecting** the development and approval of an industry site. This list may include, among others, the Occupational Safety and Health Administration (**OSHA**), the State Board of Health, and US EPA regional offices (for pollutant discharge and other **permits**, Spill Prevention, Control, and Countermeasure plan, and/or hazardous and toxic waste disposal plans).

The United States has other legislation **which** prescribe planning processes similar to the NEPA process but which are specific to certain environmental problems. Two such pieces of legislation are the Toxic Substances Control Act (TSCA, 1976) and the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA**, 1980).

TSCA requires documentation showing that plans to dispose of toxic substances "will not present an unreasonable risk or injury to health or the environment" [Section 6(e) of the Act]. An example of a report written under the TSCA requirements is the Public Health and Environmental Exposure Assessment for a PCB Separation Facility In Kentucky (1986, see Volume II i, Appendix M). Generally, the components required under NEPA for EIA are the same for TSCA assessments. However, because TSCA assessments are concerned with the level of risk associated with alternative disposal plans, the documents are often limited to discussion of possible exposure and the probabilities of exposure and usually do not contain a review of the potential health effects associated with exposure. For example, in the assessment noted above, health and environmental exposures related to ordinary plant operations and to accident emissions are identified and discussed. Critical subpopulations (termed "sensitive receptors" in the report) near a facility site or a highway transportation route are identified. Also, the probability of various exposures is calculated and analyzed, and mitigation measures to reduce these probabilities are discussed. In the end, a finding of "no unreasonable risk" or "unreasonable risk" is made.

Under CERCLA, remedial action plans need to be prepared for contaminated sites and they need to be evaluated in feasibility studies. These studies need to include technical, economic, institutional, environmental and public health analyses of each of the remedial action plan alternatives. US EPA has developed guidance for the preparation feasibility studies, Guidance on Feasibility Studies Under CERCLA (1985, see Volume III, Appendix M). An entire chapter is devoted to outlining the process to evaluate the protection of public health requirements. Briefly, this process includes:

- 1) the development of a baseline site evaluation,
- 2) the development of an exposure assessment,
- 3) the comparison of each alternative to relevant environmental standards (a table of standards, their assumptions, and their methods of development is provided),
- 4) the consideration of other criteria,
- 5) the adjustment of standards and criteria whose assumptions are inappropriate for public health evaluation (methods of adjustment were under development at the time of the guidance document's publication), and
- 6) the development of new standards which are currently unavailable or which exist but are inappropriate for this particular analysis. Methods for developing such standards are discussed in a number of US EPA guidelines:
  - Guidelines for Carcinogenic Risk Assessment (1986);
  - Guidelines for Mutagenicity Risk Assessment (1986);
  - Guidelines for Health Risk Assessment of Chemical Mixtures (1986);
  - Guidelines for Health Assessment of Suspect Developmental Toxicants (1986);



- **Guidelines** for Exposure Assessment (1986); and
- Health Risk Assessment Guidelines for **Systemic** Toxicants (1984).

The comparative analysis using appropriate standards and criteria is combined with the other analyses and summarized. Each alternative is evaluated based on the findings of each analysis and on community response criteria, and the preferred **alternative** is chosen based on the information provided. Primary importance and **weight** in the final **decision** is given to how well each alternative attains or exceeds applicable or relevant public health or environmental standards.

2.12.B For example, the US EPA reviews each **project's** circumstances and conditions. While no specific procedure **exists** to review health impacts, the potential for health concerns is examined along with other potential concerns. If a potential health risk is **identified**, the issue is noted for further **examination** in an EIA. Also, the Council on Environmental Quality (CEQ), the agency responsible for policy development and oversight of NEPA, has developed a **list** of "Indicators of Environmental Significance" to be used as **criteria** when determining which **projects** need to develop an EIS (see Volume III, Appendix M). The **list** is based on what the CEQ considers as significant and on what specific agencies have included in their regulations as significant. One of the indicators proposed by the CEQ as a general criterion for preparation of an EIS (applicable to all agencies) is "the degree to which the proposed action affects **public** health or safety."

2.12.C The US EPA has prepared and has been involved in the development of numerous **EISs** for wastewater treatment plants (**WWTPs**), power plants, and new industrial sources of pollution. The degree to which health has been addressed varies according to the project and level of risk involved. For example, an EIS prepared for the O'Hare WWTP and solids pipeline (1975, see Volume III, Appendix M) **contains** a section discussing potential exposures and health impacts to operating **personnel**. Also, a number of appendices have been devoted to the examination of potential health effects associated with sewage treatment plants. One appendix contains a questionnaire and several responses from health professionals across the country. The questionnaire seeks opinions on **synergistic** effects, health of workers and surrounding residents, health hazards associated with **WWTPs**, odour problems, minimum **distance** parameters, and protective measures for workers and residents, among other related issues. Another appendix contains a report on "Health Aspects of Sewage Treatment Facilities" and provides information on "sewage plants as aerosol generators" and "health aspects associated with the generation of **microbial** aerosols."

A more recent EIS prepared by US EPA for a proposed WWTP in the City of Fort Worth, Texas (1984, see Volume III, Appendix M) **identifies** health as a key issue to be used in **conjunction** with other issues for evaluating each alternative. Also, an entire section is devoted to the discussion of "Environmental Health" issues, such as existing health conditions of the area with respect to current sewage treatment,

diseases that may be caused by improper **handling** of sewage, and health consequences associated with each proposed alternative. No health professionals are listed in the "List of Preparers" but the public was involved throughout the scoping phase, during public meetings, and through **participation** on a **Citizen** Advisory Committee.

An **EIS** prepared by the US EPA for a proposed lignite-fired power plant and surface **lignite** coal mine (1982) provides brief remarks on potential health impacts throughout the report. Remarks are made concerning adverse health impacts resulting from the release of radionuclides from the power plant, compliance with National Ambient Air **Quality** Standards to protect public health, and sound levels in excess-of decibel limits which may result in hearing loss.

The US Forest Service (**USFS**) in the Department of Agriculture (**USDA**) and the Bureau of Land Management (**BLM**) in the US Department of Interior (**DOI**) prepare **EISs** for pesticide **application** programs on their respective lands. Both **agencies** devote entire sections to health concerns. For example, a 1986 EIS prepared by the USFS (see Volume III, Appendix **M**) contains a section on human health consequences for the general population and workers with respect to each proposed alternative for **controlling** noxious weeds. A **review** of findings in existing literature and a discussion of **mitigation** measures to protect health are included. Also, potential synergistic and interactive impacts are examined as are public comments related to health and other environmental impacts. Finally, an appendix to the report contains a detailed "Human Health Risk Analysis" conducted by a number of health professionals and includes quantitative assessments of exposure pathways, toxic, mutagenic, and carcinogenic impacts as well as a qualitative discussion of **cumulative** and synergistic exposures and effects based on a series of accident scenarios.

The BLM EIS (1986, see Volume III, Appendix **M**) contains a **similar** health impact assessment. One section of the report contains a discussion of potential health impacts based on a risk assessment methodology, an examination of the active and inert ingredients in herbicides, and a discussion of **synergistic** and cumulative health effects. An appendix to the report contains a **literature** review on effects of the **active** ingredients in chemical herbicides **while** another appendix contains a worst-case analysis with respect to potential health impacts caused by exposure to and doses of active ingredients. Attention is given to exposure analysis, risk analysis, **accident scenarios**, and **probabilities** of health risks based on the **likelihood** of **accidents**. A **toxicologist** was involved in the preparation of the report and other health professionals were among the peer reviewers.

The US Army has prepared an EIS for its "ground-based free electron laser technology integration experiment" (1986, see Volume III, Appendix **M**). The report addresses health concerns through discussions of potential safety and radiation hazards, potential consequences to health care facilities, and mitigation measures to protect health and safety. While no health professionals were listed among the preparers

of the report, the public was given a number of opportunities to raise and discuss safety and health concerns as well as other environmental concerns.

A final example of a type of project which includes attention to health concerns in an EIS is the US Army's proposal for a Chemical Weapon Stockpile Disposal Program (1986, see Volume III, Appendix M). The Army's EIS includes sections to discuss acute and chronic toxicity effects of various chemicals in weapons which were formulated "... to cause major injuries or deaths to enemy forces at wartime." Potential health effects for each proposed alternative to dispose of the weapons are discussed for normal operating conditions and for accidents. Mitigation measures to protect health and emergency plans are also reviewed. In addition, a risk analysis including probability and consequence estimates for various accident scenarios is conducted, although a number of reviewer comments note significant deficiencies in the analysis. A number of health professionals were involved in the preparation of the EIS, including a toxicologist and biochemist, a public health specialist, and a microbiologist.

- 2.12.D Usually defined by proponents based on best professional judgment, and subject to peer review. The definition depends on the specific circumstances but may be based on the life of the project (construction through operation) or on an estimated length of a release and exposure incident or another appropriate measure.
- 2.12.E Depending on the specific case, the area may be based on quantitative methods such as modeling or it may be determined qualitatively. An area of impingement may be defined as a requirement of a process other than NEPA; for example, it may be a licensing requirement of the Nuclear Regulatory Commission.
- 2.12.F The extent to which one has been done is a brief recognition that current sewage treatment facilities have not caused any disease or illness (e.g., in the EIS for the WWTP in Fort Worth, TX).
- 2.12.G For EISs regarding pesticide activities, for example, a risk analysis was conducted for people of different ages. Also, in the literature review, special remarks are made concerning potential health effects of certain herbicide chemicals on pregnant women.
- 2.12.H If necessary, potential impacts to health care facilities due to an expected increase in population or due to potential health effects caused by normal discharges or accidental discharges may be reviewed.
- 2.12. I For example, disposal procedures may be a requirement of a permitting procedure under the National Pollutant Discharge Elimination System. On the other hand, in pesticide application projects, procedures for cleaning and disposing of containers must be developed through EIA.

2.12.J For example, National Ambient Air Quality Standards (NAAQS) are based **on** potential health effects and associated threshold levels while water quality standards are based on **characteristics** of the receiving body as well as health **considerations**. Effluent **limitations**, however, are primarily based on **economic** and engineering criteria but do not exceed the standards that have been Set. These standards are used in the NEPA EIA process in that all federally funded projects must not violate or cause violations of applicable **air**, water quality, **pesticide** registration, or other standards. **Compliance** with such standards is always addressed in an EIA, and they are used as guidelines for the development and evaluation of alternatives.

## 2.13 Summary of Current Practice In California

EIA HEALTH ISSUES.	California
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation and implementing regulations</p> <p>California Environmental Quality Act (CEQA); Govt. Code 21000; CEQA Guidelines (See Note 2.13.A)</p> <p>Direct; In the CEQA guidelines (Section 15126): "An [EIS] shall identify and focus on the significant effects of the proposed project. ... The discussion shall include ... health and safety problems caused by the physical changes ..."</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>All projects receive the same level of review; agency staff makes a "determination of significance" based on the review of a proposal according to an "Environmental Checklist Form." Health is listed as a criterion on this form and in a list of "Significant Effects" (see Volume III, Appendix N).</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>No specific projects are mentioned. As CEQA is currently implemented, proponents usually address human health issues indirectly through discussion of potential effects on resources and comparison of potential impacts with environmental standards (which are in part health-based).</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; CEQA guidelines include health and safety as one issue to be addressed in the EIS (see Volume III, Appendix N). Others may be set on a case-by-case basis.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; depends on each case.</p> <p>Acousticians, Sanitary Engineers, Risk Managers, Health Department representatives are usually among those who review and comment on draft EISs; they may provide specific advice during the EIS's preparation.</p>

EIA HEALTH ISSUES	California
<p>Does the EIA address the following components of an assessment of health risks?</p> <ul style="list-style-type: none"> <li>- Exposure period</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Area of Impingement</li> </ul>	<p>Yes; as recommended by the health official or expert consultant.</p>
<ul style="list-style-type: none"> <li>- <del>Baseline</del> health study</li> </ul>	<p>No response</p>
<ul style="list-style-type: none"> <li>- Impacts to critical subpopulations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- Impacts to future generations</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- impacts to residents during construction;</li> <li>- Impacts to workers during construction;</li> <li>- Impacts to residents during plant operation;</li> <li>- impacts to workers during plant operation</li> </ul>	<p>No; indirectly through examination of environmental effects.</p>
<ul style="list-style-type: none"> <li>- An assessment of acute, short-term impacts;</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- An assessment of chronic, long-term impacts;</li> </ul>	<p>No</p>
<ul style="list-style-type: none"> <li>- An assessment of positive health impacts</li> </ul>	<p>No</p>

EIA HEALTH ISSUES	California
<p>Ooes the EIA <b>address</b> the following <b>compo-</b> nents of an assessment of health <b>risks?</b> (<b>continued</b>)</p>	
<p>- An assessment of cumulative health exposure/effects?</p>	<p>No</p>
<p>- Impacts to health care facilities</p>	<p>Yes; usually this is addressed in a general sense; that <b>is</b>, impacts to "public services" are reviewed.</p>
<p>- Review of existing literature and data</p>	<p>No response</p>
<p>- Development of methods to <b>mitigate</b> health impacts</p>	<p>No</p>
<p>- Development of accident scenarios and emergency response procedures</p>	<p>No; this is not part of an EIA, but it <b>is</b> usually required by a <b>local</b> agency as part of an approval process for an operating license.</p>
<p>- Development of waste disposal procedures</p>	<p>Yes</p>
<p>- Plan for on-going monitoring of health status</p>	<p>No; Indirectly through monitoring of resource quality.</p>

EIA HEALTH ISSUES	California
Are environmental standards/objectives used in the EIA process health-based?	Yes; they are based in part on health factors. When conducting a preliminary review of a project application, staff use standards to help determine the significance of each potential impact. The EIS expands upon each issue that is determined to be significant based on the comparison with standards.
<p>Is the public involved in the health assessment?</p> <ul style="list-style-type: none"> <li>- Discretionary/mandatory</li> <li>- Examples of public involvement (list is not all inclusive)</li> <li>- Would intervenor funding be useful?</li> </ul>	<p>Yes</p> <p>Minimum requirements are mandatory; otherwise, discretionary</p> <p>Public review of documents, involvement in public hearing if held</p> <p>No</p>

#### NOTES

- 2.13.A Another planning and assessment procedure followed by California is the development of General Plans under the state's Planning and Zoning Law. Each General Plan for a city, county, or region must address a number of environmental and health-related elements and establish requirements to protect them. Two mandatory health-related elements in a General Plan include noise and seismic elements. Other health-related elements include solid waste management and hazardous waste management. The General Plan outlines development requirements to protect the environment and public health and safety. All developments must comply with the General Plan which is in effect for a proposed site. To show compliance, the EIS for a development project must be consistent with the General Plan. If any discrepancies exist, the EIS must be amended accordingly. An example of a public health and safety component of a General Plan is located in see Volume III, Appendix N.



## 2.14. Summary of Current Practice In New York

EIA HEALTH ISSUES	New York
<p>EIA mandate</p> <p>Name of policy/ legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation and Implementing regulations</p> <p>State Environmental Quality Review Act (SEQRA) Rules and Regulations, 6 NYCRR 617 (See Note 2.14.A)</p> <p>indirect in SEQRA; implied in the requirement to assess all impacts from proposed projects. Direct in regulations; in the definition of "environment" which explicitly mentions "human health."</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>No screening procedures or criteria for health exist. Projects are reviewed by Initiating departments to determine if an EIA is needed. The Department of Environmental Conservation (DEC), the agency responsible for overseeing the administration of SEQRA, is currently developing a formal screening procedure.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Municipal waste incinerators, hazardous waste incinerators (See Note 2.14.B)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; If health is a concern, terms of reference address relevant issues. Often, issue conferences are held with the public to identify issues which are of specific concern to the public and which need to be included in the terms of reference. While a scoping checklist used in this process does not include potential human health issues, if health is an issue, it is usually identified here and included in the terms of reference.</p>
<p>Are health professionals involved in the EIA process? Who? When? How?</p>	<p>Yes; depends on each case.</p> <p>The initiating department is responsible for involving appropriate health professionals. Usually, they are involved in preparing the required health assessment documents.</p>

EIA HEALTH ISSUES	New York
Does the EIA address the following components of an assessment of health risks?	Appendix 0 in Volume III of this report contains an "Environmental Assessment Form" used by Initiating departments when preparing an EIS. Part 17 of the form addresses potential impacts of the proposed undertaking on public health.
- Exposure period	Yes; the initiating department defines the exposure period and usually bases it on the estimated length of a release and exposure Incident.
- Area of Impingement	Yes; the Initiating department usually defines it and seeks DEC approval.
- Baseline health study	No; DEC looks at incremental health risks.
- Impacts to critical subpopulations	Yes; facilities, such as nursing homes and schools, near a proposed site are identified and potential impacts on facility users are assessed.
- Impacts to future generations	No
- Impacts to residents during construction;	No
- Impacts to workers during construction;	No
- Impacts to residents during plant operation;	Yes; all exposure routes and potential health impacts are examined.
- Impacts to workers during plant operation	Yes; all exposure routes and potential health impacts are examined.

EIA HEALTH ISSUES	New York
<p>Does the EIA address the following components of an assessment of health risks? (continued)</p>	
<p>- An assessment of acute, short-term impacts;</p>	<p>Yes</p>
<p>- An assessment of chronic, long-term impacts;</p>	<p>Yes</p>
<p>- An assessment of positive health impacts</p>	<p>No</p>
<p>- An assessment of cumulative health exposure/effects?</p>	<p>Yes; no formal procedure exists. The initiating department must include a proposed protocol how cumulative effects will be evaluated. Multiple sources and multiple emissions are usually examined.</p>
<p>- Impacts to health care facilities</p>	<p>Yes; for an increase in demand due to an increase in illness from normal and accidental discharges.</p>
<p>- Review of existing literature and data</p>	<p>Yes; both epidemiological and animal test data are reviewed.</p>
<p>- Development of methods to mitigate health impacts</p>	<p>Yes</p>
<p>- Development of accident scenarios and emergency response procedures</p>	<p>No</p>
<p>- Development of waste disposal procedures</p>	<p>Yes</p>

EIA HEALTH ISSUES	New York
<p>Does the EIA address the following <b>compo-</b> nents of an assessment of health risks? (continued)</p> <ul style="list-style-type: none"> <li>- Plan for on-going monitoring of health status</li> </ul>	<p>No</p>
<p>Are environmental standards/ objectives used in the EIA process health-based?</p>	<p>Yes; they are based in part on health factors. NY DEC uses EPA standards and health assessment criteria documents to develop its own standards. They are used: in EIA to evaluate potential health and environmental impacts from proposed actions.</p>
<p>Is the <b>public</b> involved in the health assessment?</p> <ul style="list-style-type: none"> <li>- Discretionary/mandatory</li> <li>- Examples of public involve- ment (list is not all inclusive)</li> <li>- Would intervenor funding be useful?</li> </ul>	<p>Yes</p> <ul style="list-style-type: none"> <li>Mandatory</li> <li>Public <b>review</b> of documents, involvement of public in hearings if held, participation in issue conferences</li> <li>Yes</li> </ul>

#### NOTES

2.14.A A June 25, 1987 policy memorandum distributed to various offices in the Department of Environmental Conservation (**DEC**) states that **EISs** for constructing **municipal** solid waste incinerators should include "an evaluation of the health risks **associated** with emissions of air contaminants of most concern from such plants." The memorandum provides a procedure to follow when conducting this type of evaluation (see Volume III, Appendix O).

2.14.B Health assessments, as required by the policy memorandum, must include an assessment of **all** routes of exposure for contaminants expected to be emitted by the **facility**. An example of an EIS with a health risk assessment is the SCA Arc Pyrolysis Project EIS (1986). An entire

document is devoted to the Public Health Risk Assessment **Study**. The study includes an exposure **assessment**, toxicity assessment, and a discussion of health risks (see Volume III, Appendix 0).

## 2.15 Summary of Current Practice In Wisconsin

EIA HEALTH ISSUES	Wisconsin
<p>EIA mandate</p> <p>Name of policy/legislation</p> <p>Is the reference to health direct or indirect?</p>	<p>Legislation and implementing regulations</p> <p>Wisconsin Environmental Policy Act (sec. 1.11, Statutes); NR 150 Wisconsin Administrative Code</p> <p>Indirect; implied in implementation of EIA and the need to review "all relevant environmental issues."</p>
<p>What is the process followed to screen potential health concerns?</p>	<p>Screening and scoping is conducted by the Department of Natural Resources (DNR) staff; No specific criteria exist relating to human health; staff base decisions on professional judgment.</p>
<p>What are types of projects that have addressed health issues in the EIA?</p>	<p>Incinerator projects; development of ground-water standards; landfills. (See Note 2.15.A)</p>
<p>Are specific terms of reference regarding health set if health is a concern?</p>	<p>Yes; DNR staff identify issues through brainstorming and consultation with other agencies, opposition groups, the proponent and public.</p>
<p>Are health professionals involved in the EIA process?</p> <p>Who?</p> <p>When?</p> <p>How?</p>	<p>Yes; depends on each case.</p> <p>The Health Department may be one of the co-sponsors of the project, such as in the ground-water standards project. They may also be involved by providing comments on portions of the EIS and reviewing the EIS.</p>

EIA HEALTH ISSUES	Wisconsin
Does the EIA address the following <b>compo-</b> nents of an assessment of health risks?	In Wisconsin, the Department of Natural Resources ( <b>DNR</b> ), rather than the proponent or <b>initiating</b> department, is <b>respon-</b> sible for preparing an IEE or EIS. The proponent <b>supplies</b> the necessary <b>infor-</b> mation upon the request of the DNR.
- Exposure period	Yes; DNR bases the definition on reason- able measures.
- Area of Impingement	Yes; depends on each case
- Baseline health study	Usually, no; however, the Department of Health collected this data for the EIA on groundwater standards.
- Impacts to critical subpopulations	Yes; when appropriate.
- Impacts to future generations	No; this has not been an issue to date.
- Impacts to residents during construction;	Yes; risk analyses and qualitative assessments may be conducted depending <b>on</b> the nature of potential impacts.
- Impacts to workers during construction;	Yes; same as above.
- impacts to residents during plant operation;	Yes; same as above.
- Impacts to workers during plant operation	Yes; same as above.
- An assessment of acute, short-term impacts;	Yes
- An assessment of chronic, long-term impacts;	Yes
- An assessment of <b>posit i</b> ve health impacts	No

EIA HEALTH ISSUES	Wisconsin
Does the EIA address the following components of an assessment of health risks? (continued)	
- An assessment of cumulative health exposure/effects?	Yes; the science is not well-developed but DNR includes a qualitative discussion of this component and explains why quantitative analyses are not possible.
- impacts to health care facilities	Yes; this is not done on a routine basis. However, DNR may review impacts to health care facilities for very large projects.
- Review of existing literature and data	Yes; all EIAs include a literature search for environmental impacts and, if relevant, health impacts.
- Development of methods to mitigate health impacts	Yes
- Development of accident scenarios and emergency response procedures	Yes; this component is handled primarily through regulatory programs for both employees and the surrounding public. It is discussed in EIA documents.
- Development of waste disposal procedures	Yes
- Plan for on-going monitoring of health status	No; monitoring is conducted for resource quality only. It is assumed the standards used to evaluate monitoring data are adequate to protect human health.
Are environmental standards/objectives used in the EIA process health-based?	Yes; they are based in part on health factors. Wisconsin uses federally derived standards. In EIA, standards are used as targets for performance and as bases for comparison of predicted impacts;



EIA HEALTH ISSUES	Wisconsin
Is the public involved in the health assessment?	Yes
- Discretionary/mandatory	Mandatory
- Examples of public involvement (list is not all inclusive)	DNR gives public <b>notice</b> of pending EIAs and hold hearings if necessary. DNR also involves the public in scoping procedures. The <b>public</b> is allowed to review documents (including drafts) and provide comments.
- Would intervenor funding be useful?	No response

NOTES

- 2.15.A For example, in an EIA for a waste incinerator plan in Eau Claire, Wisconsin, health was addressed in a number of sections (see Volume III, Appendix P). Potential health impacts from projected air emissions are discussed. They are **analyzed** in a **quantitative** discussion of health risks due to various exposures, such as Inhalation, ingestion of contaminated fish, and other possible pathways. Waste disposal plans and **mitigation** measures to offset certain health impacts are also discussed.

## 2.16 Summary of Current Practice In Europe

The Investigation of current practice in Europe was based on a **review** of case studies rather than a review of survey and interview responses as was done for North America. As such, a set of remarks precede the tables summarizing current practice to **explain** the specific context of this portion of the report. These remarks **discuss** the context of European **EIAs, limitations** encountered during the research phase of the project, and a few general **findings** based on the research. The Introductory comments are based on discussions with the Centre for Environmental Management and Planning (**CEMP**) at the University of Aberdeen in Scotland, the subcontractor responsible for this portion of the project, and on a letter and covering note received from CEMP (see Volume III, Appendix Q).

Each table is based on a review of an actual EIS or EIS summary. The following is a **list** of the case studies on which the tables are based. They are listed alphabetically by country:

- Combined heat and power plant	England
- Proposed deep shaft colliery	England
* New reservoir for drinking water	Fed Rep of Germany
* Proposed city by-pass	Fed Rep of Germany
* New reservoir for power generation	Finland
* Proposal for major road development	Finland
- Cross channel fixed link (rail terminal)	France
- Electrical powered steel production plant	France
- Lead recovery refinery	France
- Proposed oil refinery	Ireland
* <b>Major</b> new highway	Italy
- Disposal of radioactive waste on a national basis	Netherlands
* Proposed new route for <b>major</b> road	Netherlands
* Storage of contaminated sludge from lower Rhine	Netherlands
- Water extraction for drinking and industrial use	Netherlands
* New reservoir for power generation	Norway
* New <b>section</b> of main national road	Norway
- Proposed demonstration nuclear fuel reprocessing installation	Scotland
- Proposed paper mill	Scotland

"\*" = Considerations are confined to summary documents.

"-=" Considerations are based on review of complete EIS.

A number of **difficulties** were **encountered** in gathering the case studies:

- Because of the summer holidays, governments were closed for half of the summer months. When they reopened in late August and early September, little time remained to collect reports and add to the few which had been obtained **prior** to the summer holidays;
- Many **EIAs** are written in languages other than English, making it **difficult** to ascertain **their** relevance to the **project**;
- Many reports are held in confidentiality and are not distributed to the public;
- CEMP experienced **difficulty** in obtaining examples of **sufficient** relevance and **quality** to merit review.

Due to these difficulties and the relatively small sample size, the observations made by CEMP in the tables are **limited** by the degree to which the sample is representative of studies undertaken in Europe. While the findings may not be representative, they may be indicative of current practice in Europe.

**Also**, due to the **difficulty** in obtaining a **sufficient** number of suitable studies, a number of summary EIA reports were examined as an alternative. While these summaries were not accompanied by supporting information, the breadth of **investigation** was made explicit in each case. **Thus**, the degree to which health implications were considered could be clearly established.

As the basis for this study was the review of actual and summary **EISs**, the ability to complete the entire table as was done for the North American summaries was limited. For example, EIA documents do not discuss legislation, **screening** procedures, terms of reference, or involvement of health professionals. These items relate more to the context within **which EIAs** were undertaken rather than to **individual** reports. As such, these questions (which were answered using the survey method in Canada and the United States) are not answered in the following tables. The tables are devoted primarily to the discussion of components of health impact assessment in **EISs** and answer the general question, Does the **EIS** address relevant health issues (such as potential health impacts to critical subpopulations, future generations, residents, workers, etc.)?

As noted above, these tables do not examine legislation or **legislative** procedures within which **EIA**s are either required or undertaken. In both the letter and covering note, CEMP notes the **existence** of a European Economic

Community (EEC) environmental impact directive (85/337/EEC, see Volume III, Appendix Q). Even though the directive came into force in EEC member states January 1, 1988, it influenced the development of EIA procedures prior to this date in not only EEC member states but also Scandinavia.

As the primary EIA mandate in Europe, the EEC directive contains a number of points worth noting. For example, the preamble to the directive states: ". . . the effects of a project on the environment must be assessed in order to take account of concerns to protect human health ..." Article 3 requires the EIA to identify, describe, and assess the direct and indirect effects of, among other things, "... human beings, fauna and flora ..." However, the specific requirements for addressing health-related considerations are confined by Article 5, Annex III to "... an estimate ... of expected residues and emissions ..." and a "description of the aspects of the environment likely to be significantly affected ... including population, fauna, flora ..."

Although this directive exists and gives attention to human health considerations, CEMP stresses that the legislative context of EIA within Europe is not, as yet, well-established. Efforts in Europe will most likely be focussed on establishing EIA firmly, postponing attention to the incorporation of health until a later date.

While health may not be considered during the course of EIA, CEMP comments that health considerations may be addressed in other planning processes. For example, health considerations may be addressed through a permitting or regulatory process. Also, they may be included in programs which are more safety than environment oriented, as traditionally in Europe health has been linked with safety more than environmental issues.

Where health is considered in EIA, a few general findings may be made. First, there is a general tendency in Europe to consider health factors related to the day to day operation of a project rather than to potential incidents which may have a far greater effect on human health. On the other hand, no clear evidence exists regarding greater consideration to health effects "within the factory fence" than to effects arising from exposure of humans outside the facility boundaries.

Second, through its research, CEMP has discovered that separate documentation on health exists for many EISs. However, it was impossible to obtain any such documentation. For example, CEMP knows of a number of

documents on environmental health **issues** produced by members of the petrochemical industry, but they are not available to the public.

Finally, health has not been identified as a major **issue** in preliminary "**scoping**" of **EIAs** where scoping was undertaken and it has not emerged as an issue during public consultation.

With these points in mind, the following tables present a summary of current practice in Europe as based on the review and analysis of the case studies mentioned above.

Nature of Project: Combined Heat and Power Scheme for Sheffield

Country: England

Date: 1985

Reason for **EIA**: Part of EEC funded feasibility study Into Combined Heat and Power

Prepared by: Sheffield Environmental Health Department

<u>Question</u>	<u>Answer</u>
<b>Is</b> a particular exposure period defined?	No
<b>Is</b> an <b>area</b> of impingement defined?	Not specifically. Various areas are mentioned with regard to some of the likely emissions.
<b>Have</b> baseline studies been carried out if so what are they?	Yes. Since 1984 Sheffield has had a detailed monitoring system for <b>SO<sub>2</sub></b> , <b>NO<sub>x</sub></b> and smoke and these were used for the baseline study of the EIA.
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	Yes. <b>The possibility</b> of <b>SO<sub>2</sub></b> accumulation in the environment is considered although it is stated that this is unlikely to be a problem.
<b>a)</b> Are health impacts to residents during construction assessed?	No
<b>b)</b> Are health impacts to workers during construction assessed?	No
<b>c)</b> Are health impacts to residents and employees during project operation considered?	Yes. Problems of odour and <b>SO<sub>2</sub></b> and <b>NO<sub>x</sub></b> concentration in adverse atmospheric conditions are considered.
Is animal data or data from other locations used to identify potential health impacts?	No
<b>a)</b> Does the proponent determine and assess potential acute, short-term impacts to human health?	<b>Yes.</b> The <b>possibility</b> of excessive levels of <b>SO<sub>2</sub></b> in adverse weather conditions is discussed.
<b>b)</b> Potential, chronic long-term impacts?	Yes. Potential pollutant levels have been carefully modelled using a computer model based on the baseline data.
<b>c)</b> Potential positive health impacts?	<b>Yes.</b> The effect of the plant will be to reduce emissions from other parts of the city (due to other plants being made redundant) As a result overall <b>SO<sub>2</sub></b> , <b>NO<sub>x</sub></b> and smoke levels over the city will be reduced.

Question

Answer

Does the proponent involve the public in assessing potential human health impacts?

No

Does the proponent examine existing exposure **levels** and assess the potential cumulative effect of additional exposure caused by the proposed project?

**Yes.** Due to the nature of the development, levels of **SO<sub>2</sub>, NO<sub>x</sub>** and smoke over the city as a whole will be reduced. However, localised increase may occur and cumulative levels may be considered to be a problem.

Does the proponent consider methods of mitigating potential health Impacts?

Yes. Methods of mitigating all known problems with the CHP. However *many* of the potential emissions have only been estimated and the exact mitigation measures have not been covered.

a) **Does** the proponent identify and assess potential impacts on health care facilities due to a rise in population (Increased employment)?

No

b) Due to potential health effects of normal discharges?

No

c) Due to potential health effects of accidental discharges?

No

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of a contaminant release for employees?

No

b) For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its wastes and **its** waste by-products to **minimize** potential environmental/human health?

Not specifically. This has been considered but is not discussed in the report.

Does the proponent develop a means of monitoring ongoing human health effects?

**All** emissions from the plant will be monitored, but not from the point of view of health effects.



Nature of Project: Proposed Deep Shaft Colliery

Country: England

Date: 1987

Reason for EIA: To examine the environmental Implications of a proposal to develop a coal prospect in the Midlands region of England. (The report was submitted to the local planning agency in support of the proponents application for "planning permission".

Produced by: Environmental Resources Ltd., a private firm of environmental consultants.

Question

Answer

**Is** a particular exposure defined?

No

**Is** an area of Implngment defined?

Not specifically. Properties are Identified which are considered to experience impact (noise, dust) but no boundary area is defined.

**Have basellne studies** been carried out, **if** so what are they?

Monitoring to determine present noise levels and air quality (dust) has been undertaken, though no Indication of methods, duration and frequency of sampling is given.

Are critical subpopulations identified and potential health impacts Identified?

No. Reference is made only to dust and nearby dwellings - "**dust** from the mine site **is** not expected to reach levels high enough to damage human health or vegetation!"

Are potential health Impacts that may occur in future generations examined?

No

a) Are health impacts to residents during construction assessed?

No. Recognition of noise and dust "nuisance" is made though Impacts to health are not considered as such.

b) Are health impacts to worker6 during construction assessed?

No

c) Are health impacts to resident6 and worker6 during project operation considered?

No, only in **terms** of nuisance.

Is **animal test data or data from other** location6 used to identify potential health Impacts?

No. Limited reference is made to experience at another colliery in controlling dust emissions from the mine site, though not from the point of view of impacts to health.

a) **Does** the proponent determine and assess the potential acute, short-term impacts to human health?

No

b) potential chronic, **long-** term effects?

No

c) Potential positive health impacts? No

Question

Answer

Does the proponent involve the public in assessing-potential human health impacts?

No, consultation with local government, statutory and non-statutory bodies and public groups has been undertaken, though **health does not appear to have** emerged as a relevant concern.

Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?

Not specifically. Reference is made to **impacts of** other operations in the vicinity, but from the point of view of **their contribution to base-line conditions, rather than** from a health viewpoint.

Does the proponent consider methods of mitigating potential health Impacts?

Not specifically, **Much is made of the fact that adverse consequences of the original proposal have been "mitigated out" in more recent designs though no specific reference is made to health impacts.**

a) **Does** the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?

No. **No regard is given to the need for additional services.**

b) due to potential health effects of normal discharges?

No

c) due to potential health effects of accidental discharges?

No

a) **Does** the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of a contaminant release for employees?

No

b) for the affected public in the vicinity of the project?

No

Question

Does the proponent plan a procedure for the **disposal** of **its wastes** and by-product<sup>6</sup> to **minimize potential** environmental/health Impacts?

Does the proponent develop a means of monitoring on-going human health effect<sup>6</sup> during operation?

Answer

Attention **is** given to the **disposal** of **spoil** overburden from shaft excavation and coal seam establishment. **This** waste <sup>16</sup> not hazardous nor deemed to represent effect<sup>6</sup> to health. Environmental impact **is minimized** by the **disposal** of spoil in dlsused sand quarry volds, thereby avoiding the **sterilization** of new land and **minimizing** visual intrusion. Rehabilitation of the **site is** considered a beneficial impact. Some attention **is** paid to the potential contamination of ground water<sup>6</sup> which is observed to have health **implications** through contamination of potable water supply, but is considered not to be significant and easily controllable within statutory water quality standards.

**No.** Post project (effects) monitoring is restricted to noise and air quality.

Nature of Project: Major new dam and reservoir for drinking water

Country: Federal Republic of Germany

Date: 1980/81

Reason for **EIA**: Assessment of impact of proposed dam

Proposed by (proponent) Water supply company

From UNECE 1987. Application of **EIA**. Highways and Dams

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined?	Yes roughly-area of reservoir and catchment.
Have baseline studies been carried out, if so what are they?	No health aspects
Are critical subpopulations identified and potential health impacts identified if led?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are <b>health</b> impacts to residents during construction assessed?	No
b) Are health impacts to workers during <b>construction</b> assessed?	No
c) Are health impacts to residents and employees during projects operation considered?	No
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	No
b) Potential, chronic long-term impacts?	No
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human <b>health</b> impacts?	No, the project was abandoned before public consultation for which provision was made.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	No

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health impacts?	No
a) Does the proponent identify and assess potential Impacts on health care facilities due to a rise In population (increased employment)?	No
b) Due to potential health effects of normal discharges?	No
c) Due to potential health effects of accidental discharges?	<b>No</b>
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	No
Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?	No
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No

Nature of Project: Proposed city by-pass

Country: Federal Republic of Germany

Date : 1979

Reason for EIA: Evaluation of impact of proposed by-pass

Proposed by (proponent):City of Wiesbaden

From UNECE 1987 Application of EIA. Highways and Dams



<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an <b>area</b> of impingement defined?	Yes, considered for air pollutants and noise : <b>area</b> would appear to have been determined by modelling.
Have baseline studies been carried out, if so what are they?	No evidence.
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health Impacts that may occur in future generations examined?	Modelling, not described in this summary, had clearly been carried out for noise and air pollutants.
a) Are health impacts to residents during construction assessed?	Not discussed
b) Are health impacts to workers during <b>construction</b> assessed?	Not discussed
c) Are health Impacts to residents and employees during projects operation considered?	Not discussed
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Not described in this summary but some consideration has clearly been given <b>with</b> respect to noise and air pollutants.
b) Potential, chronic <b>long-term</b> impacts?	<b>As</b> above.
c) Potential positive health impacts?	Yes consideration is given to reduction in noise and air <b>pollutants</b> .

**Question**

**Answer**

Does the proponent involve the public assessing potential human health impacts?

Yes, to the extent of considerations described above.

Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?

Not mentioned.

Does the proponent consider methods of mitigating potential health impacts?

No

a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?

No permanent increase in population encouraged.

b) Due to potential health effects of normal discharges?

As above.

c) Due to potential health effects of accidental discharges?

As above.

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?

No

b) For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?

Not described.

Does the proponent develop a means of No monitoring ongoing human health effects during operation?

Nature of Project: Major new demand reservoir for power generation

Country: Finland

Date : 1972/1982

Reason for EIA: Assessment of **input** of proposed dam

Produced by(proponent): Water Supply Company

From UNECE 1987, Application of EIA. Highways and Dams.

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined?	Yes. Area of reservoir and catchment.
Have baseline studies been carried out, if so what are they?	No health aspects.
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	No. Consideration is given to amenity aspects.
<b>b)</b> Are health impacts to workers during <b>construction</b> assessed?	No
c) Are health impacts to residents and employees during projects operation considered?	No
<b>Is</b> animal test data or data from other locations used to identify potential health impacts?	No
<b>a)</b> Does the proponent determine and assess potential acute, short-term impacts to human health?	No
<b>b)</b> Potential, chronic long-term impacts?	No
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human health impacts?	No. Public comment was invited but health does not appear to have been an issue.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	No

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health Impacts?	No
a) Does the proponent identify and assess potential Impacts on health care facilities due to a rise in population (increased employment)?	No
b) Due to potential health effects of normal discharges?	No
c) Due to potential health effect6 of accidental discharges?	No
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures In case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	No
Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?	No
Does the proponent develop a means of No monitoring ongoing human health effect6 during operation?	No

Nature of Project: Proposed major road development

Country: Finland

Date: **1984**

Reason for **EIA**: Consideration of alternative routes

Produced by (Proponent): National Board of Roads and Water Ways

From UN'ECE 1987. Application of EXA. Highways and Dams

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined? noise.	Not clearly defined other than for noise.
Have baseline studies been carried out, if so what are they?	Not other than noise.
Are critical <b>subpopulations</b> identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	Not other than noise modelling.
a) Are health impacts to residents during construction assessed?	Not other than noise.
b) Are health impacts to workers during <b>construction</b> assessed?	A6 above.
c) Are health impacts to residents and employees during projects operation considered?	As above.
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Not other than noise.
b) Potential, chronic long-term impacts?	A6 above.
c) Potential positive <b>health</b> impacts?	No
Does the proponent involve the public assessing potential human health impacts?	Public concern on noise had been taken into account.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	Yes with respect to noise, modelling had been carried out.

Question

Answer

Does the proponent consider methods of mitigating potential health Impacts?

Not mentioned in this summarised EIS although clearly some consideration had been given.

a> Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?

No. No permanent increase in population envisaged.

b) Due to potential health effects of normal discharges?

**As** above.

c) Due to potential health effects of accidental discharges?

As above.

a> Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for. employees?

No

**b)** For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?

Not described.

Does the proponent develop a means of monitoring ongoing human health effects **during** operation?

No



Nature of Project: Cross-Channel fixed link (French rail terminal)

Country: France

Date: 1985

Reason for **EIA**: Public Consideration of project

Produced by: Proponent ministries Including Transport

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No clear definition.
Is an area of impingement defined?	Yes varying according to impact reviewed e.g. noise and visual impact.
Have baselines studies been carried out, if <b>so</b> what are they?	Not included
Are critical subpopulations identified and potential health <b>Impacts identified</b> ?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	<b>General</b> consideration is given to noise and dust and the construction and operational phases are separated to some extent.
b) Are health impacts to workers during <b>construction</b> assessed	As above
c) Are health <b>Impacts</b> to residents and employees during projects operation considered?	<b>As</b> above
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Only within general consideration of noise.
b) Potential, chronic long-term <b>Impacts</b> ?	<b>As</b> above
c) Potential positive health impacts?	As above
Does the proponent involve the public assessing potential human health impacts?	The document is intended for public.

<u>Question</u>	<u>Answer</u>
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	Background noise levels are described.
Does the proponent consider methods of mitigating potential health impacts?	Yes noise barrier will be constructed as part of project.
a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?	No. Consideration is given to increases in population, which are calculated for different phases.
b) Due to potential health effects of normal discharges?	No. As above
c) Due to potential health effects of accidental discharges?	No. As above
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	no
Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?	In broad terms yes without specific investigation of health aspects.
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No

Nature of Project: Recovery of about 27000 t y<sup>-1</sup> of lead almost entirely from **batteries**. Plant is already operational.

Country : France

Date: 1982

Reason for EIA: Request from provincial authority

Produced by: Proponent company

Question

Answer

**Is** a particular exposure **period** defined?

**Vaguely** defined **as** long-term.

**Is** an area **of** impingement defined?

**No. Mention is made of** neighbourhood **without clear** definition.

**Have** baseline **studies been** carried out **If so what** are they?

**EIA is** post-operational with no evidence of baseline studies - however the **EIA resulted from an** undisclosed neighbourhood health study.

Are critical **subpopulations** identified and potential health impact<sup>6</sup> Identified?

Yes. Categorisation Into group<sup>6</sup> **such** a<sup>6</sup> women, **smokers etc who are at** more or **less** risk.

Are potential health impacts that may occur in future generations examined?

Not within scope of document but proponent is clearly aware of long-term aspects.

**a)** Are health Impacts to residents during construction assessed?

**No.** Post-construction study i.e. the plant ha<sup>6</sup> been operational for **some** years.

**b)** Are health impacts **to** workers during construction assessed?

**No. See above**

**c)** Are health impacts to residents and employees during project operation considered?

Yes. Exposure by inhalation and ingestion and routes to these via dust, vegetation, food-chain. Health assessment programme for employee<sup>6</sup> on regular basis with specific attention to symptoms of lead poisoning. The document was required by the provincial authority a<sup>6</sup> a result of neighbourhood health assessment. There is also evidence of concern for animal health. Analysis for lead is carried out on a comprehensive basis with distinction between **soluble** and insoluble lead.

**Is** animal test data or data from **other** location<sup>6</sup> used to identify potential health impacts?

Not specifically mentioned although clearly fully aware of background. A **clear and concise description is** given of the symptoms etc, of lead poisoning.

Question

Answer

a) Does the proponent determine and assess potential acute, short-term Impacts to human health?

Yes. In description referred to above.

b) Potential **ial**, chronic long-term Impacts?

Yes. As above.

c) Potential positive health Impacts?

No. Does state the advantages of good housekeeping etc.

Does the proponent involve the public in assessing potential human health Impacts?

No. **As** described above the provincial authority has used an external consultant but there **is** no evidence of any information being made public.

Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?

Yes. Reference **is** made to background levels of both noise and lead and the effect of amelioration measures is addressed. There is no clear reference to the use of risk assessment and for both lead and noise effects would appear to be by simple addition or subtraction.

Does the proponent consider methods of mitigating potential health Impacts?

Yes. Methods of improving recovery of lead and noise attenuation.

a) Does the proponent identify and assess potential impacts on health care **facilities** due to rise in population (increased employment)?

No

b) Due to potential health effects of normal discharges?

No

c) Due to potential health effects of accidental discharges?

No

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedure<sup>6</sup> in case of contaminant release for employees?

No. Only superficial mention of emergency response.

b) For the affected public in the vicinity of the project?

No

QuestionAnswer

Does the proponent plan a procedure for disposal of its wastes and its waste by-product<sup>6</sup> to minimize potential environmental/human health Impacts?

Yes. By contracting to another organization. No mention of controls, monitoring or auditing procedures.

Does the proponent develop a means of monitoring ongoing human health effects during operation?

Yes. Any programme beyond the "factory fence" would appear to be outside the scope of the document (and possibly not the direct responsibility of the proponent). Employee<sup>6</sup> are subject to regular health assessment using a complex index which integrates exposure, any clinical symptoms and any groups such as identified previously.

Nature of Project: Steelworks manufacturing 259,000 t<sup>1</sup>.y- of molten steel

Country: France

Date : 1983

Reason for **EIA**: Detailed assessment of site following earlier screening of three possible sites

Produced by: Proponent Company



<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	NO
Is an area of impingement defined?	<b>Yes in broad terms by extrapolation from similar steelworks.</b> For noise the measurement points are chosen taking the local population into account.
Have baseline studies been carried out, if so what are they?	Baseline noise study are appended as are detail of <b>soluble and insoluble precipitation at several other similar and "control" locations.</b>
Are critical subpopulations identified and potential health impacts identified?	No, <b>only with reference to neighbourhood noise are specific areas of population identified.</b>
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction <b>assessed</b> ?	No
b) Are health impacts to workers during construction assessed?	No
c) Are health impacts to residents and employees during project operation considered?	No
Is animal test data or data from other locations used to identify potential health impacts?	No. Health aspects are not specifically addressed.
a) Does the proponent determine and <b>assess potential acute, short-term impacts to human health</b> ?	No. <b>Only noise is addressed.</b>
b) <b>Potential, chronic long-term impacts?</b>	No
c) <b>Potential positive health impacts?</b>	No
Does the proponent involve the public in assessing potential human health impacts?	No. <b>There is no evidence of public involvement although it is possible that the EIA was prepared for general consideration.</b>

Question

Answer

Does the proponent examine existing exposure **levels** and assess the potential cumulative effect of additional exposure caused by the proposed project?

**yes.** Results from studies at several relevant sites on quantity and composition of sedimented particles (from air) are presented. No set procedure for the new steelworks is presented.

Does the proponent consider methods of mitigating potential health Impacts?

Yes. Noise reduction methods are considered, **as** are methods of recovering airborne particles.

a) Does the proponent identify and **assess** potential Impacts on health care facilities due to a rise in population (increased employment)?

No

**b)** Due to potential health effects of normal discharges?

No

**c)** Due to potential health effects of accidental discharges?

No

**a)** Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of a contaminant release for employees?

Only in outline.

**b)** For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its waste and its waste by-products to minimize potential environmental/human health impacts?

**Yes.** The accent is on recycling where possible either at the same or adjacent work<sup>6</sup> with some, possibly permanent, storage of non-recyclable waste on the same site. The eventual fate of non-recyclable waste is not addressed. A general statement is made that there are no toxic wastes.

Does the proponent develop a means monitoring ongoing human health effects during operation?

Yes. Regular **visits**(two half days per week) of a specialist in occupational medicine.

Nature of Project: Proposed 011 Refinery, tank farm, marine terminal and associated work6 at Tarbert

Country: Ireland

Date: 1982

Reason for EIA: Requested by Kerry County Council as part of the application for Planning Permission

Prepared by: Aran Energy Ltd (Proponents) and a commissioned team of experts.

**Question**

**Answer**

**Is** a particular exposure **period** defined?

Not specifically, although period<sup>6</sup> of a year are mentioned for SO<sub>2</sub>, NO<sub>x</sub> build up in the environment.

**Is** an area of Impingement defined?

Yes. An affected area is clearly defined and **split** into primary and secondary **zones**.

Have baseline studies been carried out, if **so** what are they?

Yes. Extensively for noise and atmospheric **emissions**.

**Are critical subpopulations** identified and potential health Impacts identified?

Various population centre<sup>6</sup> are mentioned a<sup>6</sup> well a<sup>6</sup> a small local school. No **mention** of health effect<sup>6</sup> specifically however.

Are potential health impact<sup>6</sup> that may occur in future generation<sup>6</sup> examined?

No, apart from the mention of possible danger of SO<sub>2</sub> build up.

Are health impact<sup>6</sup> to residents a) during construction examined?

No

b) Are health impact<sup>6</sup> to worker<sup>6</sup> during construction **assessed**?

No

c) Are health impacts to residents and employees during project operation considered?

Yes, but only public, not employees,

Is animal test data or data from other locations used to identify potential health impacts?

Yes. Extensive use **is** made of data from similar plant<sup>6</sup> and a number of local industries, eg. a power station.

a) **Does the** proponent determine and **assess** potential acute, short-term impacts to human health?

Not specifically. Mention is made of possible short-term risks, but not health effects.

**b) Potential, chronic** long-term impacts?

As above

c) Potential positive health impacts? No

**Does the proponent involve the public** in assessing potential human health impacts?

No. The document is an EIA and has had no public input.

## Question

## Answer

Does the **proponent examine** existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?

**Yes.** Notably atmospheric emissions and noise levels. However more time is spent on how the exposure levels will be kept within the required limits rather than their effects.

Does the proponent consider methods of mitigating potential health Impacts?

**Yes.** These' have been covered extensively for **all areas** of the plant, noise, **air emissions**, oil spillages etc.

**a) Does the proponent identify and assess potential impacts on health care facilities** due to a rise in population (increased employment)?

No

**b) Due to potential health effects Of normal discharges?**

No

**c) Due to potential health effects of accidental discharges?**

No

**a) Does the proponent examine and accident scenarios and corresponding emergency response procedures In case of a contaminant release for employees?**

**Yes.** For oil spillages only. develop Explosions/fire are covered but only by a risk assessment. Little mention is made of health effects. The risk assessment is detailed and covers virtually all aspects of the refinery.

**b) For the affected public in the vicinity of the project?**

**As** above

Does the proponent plan a procedure for disposal of its wastes and its waste by-products to **minimize** potential environmental/human health impacts?

**yes.** **Disposal** of **all** wastes at the refinery is considered. Solutions include recycling, Incineration and landfill (onsite).

Does the proponent develop a means of monitoring ongoing health effects during operation?

No. Although discharges from the plant will be continually monitored to ensure they remain within legal limits.

Nature of Project: Major new highway

Country: Italy

Date: 1985

Reason for EIA: Assessment of impact of proposed road and options, and to serve as an “experimental” EIA in Italy

Produced **by(Proponent)**: Regional Government of Umbria using consultants including Dr Galletta

Based on paper presented by Dr B Galletta (1985) at international seminar on Environmental **Impact** Assessment, 1985, Aberdeen, with access to parent document in Italian.

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an <b>area</b> of impingement defined?	Yes in broad terms but not for health.
Have baseline studies been carried out, if <b>so</b> what are they?	No only noise exposure studied.
Are critical subpopulations identified and potential health impacts Identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health Impacts to resident6 during construction assessed?	Consideration of noise.
<b>b)</b> Are health impacts to workers during <b>construction</b> assessed?	No
<b>c)</b> Are health impacts to residents and employees during projects operation considered?	Only noise exposure.
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term Impacts to human health?	<b>NO</b>
<b>b)</b> Potential, chronic long-term impacts?	Only with respect to noise.
<b>c)</b> Potential positive health Impacts?	As above
Does the proponent involve the public assessing potential human noise, health Impacts?	Public were polled at outset of project before <b>EIA</b> was considered. Other than noise, health issues did not appear to have been an issue. Accident risks do not appear to feature in the EIA.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	Yes to noise no details of procedures.

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health impacts?	Yes with respect to noise - baffles etc.
a) Does the proponent Identify and assess potential Impacts on health care facilities due to a rise in population (increased employment)?	No
b) Due to potential health effects of normal discharges?	No
c) Due to potential health effects of accidental discharges?	No
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	No
Does the proponent plan a procedure for disposal of its wastes and its by-products to <b>minimize</b> potential environmental/human health impacts?	No
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No



Nature of Project : Disposal of radioactive waste on a national basis with reference to different scenarios for quantities and quality.

Country: Netherlands

Date : 1986

Reason for EIA: Preparation of a document for public consideration.

Produced by: Central National Organization for Radioactive Waste

**Question****Answer**

Is a particular exposure period defined?

**Yes**, 50-100 years.

**Is** an area of impingement defined?

Not specifically although clear concern with national boundary.

**Have** baseline **studies** been carried out, if **so** what are they?

Data have **clearly** been collected and studied and a comprehensive summary is Included.

Are critical subpopulations Identified and potential health impacts Identified?

No, not covered specifically although the proponent is clearly **awareof** them.

Are potential health impacts that may occur in future generations examined?

Not specifically although incremental exposures that may arise from various options for radioactive waste disposal are calculated.

**a)** Are health impacts to resident6 during construction **assessed**?

No

**b)** Are health impacts to worker6 during construction **assessed**?

No

**c)** Are health impacts to residents and employees during project operation considered?

**Yes**. Detailed studies of exposure to natural and waste radiation have been carried out.

**Is** animal test data or data from other locations used to identify potential health impacts?

Clearly data has been used although no details or summary are presented Reference is made to the International Commission on Radiological Protection.

**a)** Does the proponent determine and assess potential acute, short-term impacts to human health?

Not covered specifically although proponent has clearly taken this into consideration.

**b)** Potential, chronic long-term Impacts?

As above

**c)** Potential positive health impacts? No

QuestionAnswer

- Does the proponent involve the public assessing-potential human health impacts?** **Yes.** The document is designed for public consideration. There are numerous sub-reports dealing with specific aspects which were not available to the reviewer. The government is a minority shareholder in the planned enterprise.
- Does the proponent examine existing exposure level6 and assess the the potential cumulative effect of additional exposure caused by the prepared project?** **Yes.** For example, background radiation arising from different soils and sub-soils is considered and different scenarios are used to develop calculations of possible future radiation exposure levels.
- Does the proponent consider methods of mitigating potential health Impacts?** **Yes.** Optimisation of transportation and construction of storage buildings. Concentration of waste to minimize volumes and process design to minimize handling requirements.
- a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?** **No**
- b) Due to potential health effects of normal discharges?** **No**
- c) Due to potential health effects of accidental discharges?** **No**
- a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedure6 in case of contaminant release for employees?** **Yes.** A variety of possible emergencies are discussed.
- b) For the affected public in the vicinity of the project?** **Yes.** As above.
- Does the proponent plan a procedure for disposal of its wastes and its waste by-products to minimize potential environmental/ human health impacts?** **Yes.** Apart from radioactive waste consideration is given to incineration of wastes such as solvents and water.

Question

Does the proponent develop a means of monitoring ongoing human health effects during operation?

Answer

**Yes**, although this is not described in detail it is clear that employees and some member6 of the public would be part of a health monitoring programme. The lack of detail does not allow judgement on adequacy, however.

Nature of Project: Proposed new route for major road

Country: Netherlands

Date : 1977/78

Reason for EIA: Evaluation of alternative routes and also a trial run for EIA procedures in the Netherlands

Produced **by(proponent)**: Department of Public Works of Ministry of Transport and Public Works

From UNECE 1987. Application of EIA. Highways and Dams

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined? been determined by modelling but <b>is</b> not	Area for noise and carbon monoxide has defined in this summary.
Have baseline studies been carried out, if <b>so</b> what are they?	Yes eg noise and accidents.
Are critical subpopulations identified and potential health impacts identified?	Not other than general health consideration, however human health and well-being (noise risks) is listed as one main environmental impact.
Are potential health impacts that may occur in future generations examined?	No
<b>a)</b> Are health impacts to residents during construction assessed?	Not separated from <b>b)</b> and <b>c)</b>
<b>b)</b> Are health impacts to workers during <b>construction</b> assessed?	Not separated from a) and <b>c)</b>
<b>c)</b> Are health impacts to residents and employees during projects operation considered?	<b>Yes.</b> Noise and atmospheric contamination with carbon monoxide specifically discussed. Risks from transport of hazardous substances are included.
Is animal test data or data from other locations used to identify potential health impacts?	Not specifically discussed.
a) <b>Does</b> the proponent determine and assess potential acute, short-term impacts to human health?	Consideration given to noise and air pollutions and risks from incidents including benefits that may arise from reduction <sup>6</sup> in exposure and reductions in road accident frequency.
<b>b)</b> Potential, chronic <b>long-term</b> impacts?	A6 above.
<b>c)</b> Potential positive health impacts?	As above.

**Question****Answer**

Does the proponent involve the public assessing potential human health impacts?

Yes public involvement is part of process but was not clearly defined by regulations at time of this "trial" EIA.

Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?

No

Does the proponent consider methods of mitigating potential health impacts?

Yes eg reduction<sup>6</sup> of risks of spillage<sup>6</sup> of hazardous substances but consideration is Superficial.

a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?

No permanent increase in population foreseen.

b) Due to potential health effects of normal discharges?

As above.

c) Due to potential health effects of accidental discharges?

As above.

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?

General consideration given to accidents and spillages but scenarios are not developed in detail.

b) For the affected public in the vicinity of the project?

As above.

Does the proponent plan a procedure for disposal of its wastes and its by-products to **minimize** potential environmental/human health impacts?

NO

Does the proponent develop a means of monitoring ongoing human health effects during operation?

No

Nature of project: Storage of contaminated sludge from lower Rhine

Country: Netherlands

Date: 1986

Reason for EIA: Evaluation of alternative sites and consequences of storing contaminated sludge

Produced by: Rotterdam Public Works Dept. Rotterdam Port Authority and the Ministry of Transport and Public Works.

This is based not on a full **EIA** document but on a summary prepared for the public.



<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	Yes. 15 years with consideration beyond
Is an area of <b>impingement</b> defined?	Yes. Area of likely contamination of water.
Have baseline studies been carried <b>out</b> , if so what are they?	No
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	No
b) Are health impacts to workers during <b>construction</b> assessed?	No
c) Are health impacts to residents and employees during projects operation considered?	No
Is animal test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Cadmium and zinc are mentioned but not specifically in the context of human health. Clearly these have been assessed with respect to health.
b) <b>Potential, chronic</b> long-term impacts?	
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human health impacts?	Yes. The public has been Involved.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	Yes. Background levels are discussed without description of procedures.

Question

Answer

Does the proponent consider methods of mitigating potential health impacts?

Yes. Design of storage facilities takes this into account.

a> Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?

No increase foreseen.

b) Due to potential health effects of normal discharges?

Yes. Design of storage facilities takes this into account.

c) Due to potential health effects of accidental discharges?

No

a> Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?

No

b) For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its wastes and its by-products to minimize potential environmental/human health impacts?

This is essentially a self-contained waste disposal project.

Does the proponent develop a means of monitoring ongoing human health effects during operation?

No evidence.

Nature of Project: Future Drinking and Industrial Water Extraction  
Options for Province of North Holland

Country: Netherlands

Date : 1981

Reason for EIA: To examine possible future options for increasing  
water supply and to serve as a model EIA prior to  
introduction of statutory requirements

Produced by: Ministry of Health and Environment Protection with  
Finance from Ministry of Cultural Affairs, Recreation  
and Environmental Protection using consultants - OD  
205; Centre for Environmental Studies, University of  
Leiden; National Institute for Water Supply; State  
Institute for Nature Management.

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	Yes. A 1995 and beyond 2000 (in less detail).
Is an area of Impingement defined	Yes. Province of North Holland.
Have baseline studies been carried out, if so what are they?	No reference to background health data.
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	No
b) Are health impacts to workers during construction assessed?	No
c) Are health impacts to residents and employees during projects operation considered?	NO
Is animal test data or data from other locations used to identify potential health impacts?	Not relevant as health aspects not reviewed.
a) Does the proponent determine and assess potential acute, short-term impacts to human health	No
b) Potential, chronic long-term impacts?	No
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human health impacts?	Not through this EIS although public is involved in review of statement.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	No

Does the proponent consider methods of mitigating potential health impacts?

No

a) Does the proponent identify and assess potential Impacts on health care facilities due to a rise In population (increased employment)?

No

b) Due to potential health effects of normal discharges?

No

c) Due to potential health effects of accidental discharges?

No

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?

Mention of possible incidents eg. spills of **chlorine** but risk to humans not discussed.

b) For the affected public in the vicinity of the project?

As above

Does the proponent plan a procedure for disposal of its wastes and its waste by-products to **minimize** potential environmental/human health impacts?

Waste is addressed but from ecological rather than health viewpoint.

Does the proponent develop a means of monitoring ongoing human health effects during operation?

No

Nature of Project: Proposed new dam and reservoir for power generation

Country: Norway

Date: 1973-81

Reason for EIA: Evaluation of impact of new reservoir and local alternatives

Produced by (proponent): Directorate of the State Power System

From UNECE 1987 Application of EIA. Highways and Dams

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined?	Yes. Area of reservoir and catchment.
Have baselines studies been carried out, <b>if</b> so what are they?	No evidence of health aspects being included.
Are critical <b>subpopulations</b> identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	No
b) Are health impacts to workers during <b>construction</b> assessed?	No
c) Are health impacts to residents and employees during projects operation considered?	No
Is <b>animal</b> test data or data from other locations used to identify potential health impacts?	No
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	No
b) Potential, chronic long-term impacts?	No
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human health impacts?	Public was consulted but health was not raised.
Does the proponent examine existing exposure levels and <b>assess</b> the potential cumulative effect of additional exposure caused by the proposed project?	No

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health impacts?	No
a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?	No
b) Due to potential health effects of normal discharges?	No
c) Due to potential health effects of accidental discharges?	No
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
<b>b)</b> For the affected public in the vicinity of the project?	No
Does the proponent plan a procedure for disposal of its wastes and its by-products to <b>minimize</b> potential environmental/human health impacts?	No
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No



Nature of Project: New section of main national road

Country: Norway

Date: **1978/80**

Reason for EIA: Consideration of options

Produced by **(proponent):County** Road Direction

From UNECE 1987. Application of EIA. Highways and Dams

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health impacts?	Not other than by comparison of accident risks and noise from project options.
a) Does the proponent identify and assess potential impacts on health care facilities due to a rise in population (increased employment)?	No. No permanent increase in population foreseen.
b) Due to potential health effects of normal discharges?	As above.
c) Due to potential health effects of accidental discharges?	As above
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	No
Does the proponent plan a procedure for disposal of its wastes and its by-products to <b>minimize</b> potential environmental/human health impacts?	No
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No

<u>Question</u>	<u>Answer</u>
<b>Is</b> a particular exposure period defined?	No
Is an area of impingement defined?	Yes not detailed In this summary.
Have baseline studies been carried out, if so what are they?	Yes with respect to accidents noise.
Are critical subpopulations identified and potential health impacts identified?	No
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	Yes construction and operation are clearly separated.
b) Are health impacts to workers during <b>construction</b> assessed?	No but no clear evidence of workers being considered.
c) Are health impacts to residents and employees during projects operation considered?	Yes
<b>Is</b> animal test data or data from other locations used to identify potential health impacts?	No. Accident statistics and graphic calculations of noise have been used.
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Not other than noise and accidents.
b) Potential, chronic long-term impacts?	<b>As</b> above.
c) Potential positive health impacts?	No
Does the proponent involve the public assessing potential human health impacts?	Yes. Public comment was invited but health does not appear to have been an issue. Public Involvement seems to be decided by competent authority.
Does the proponent examine existing exposure levels and assess the potential cumulative effect of additional exposure caused by the proposed project?	No

<u>Question</u>	<u>Answer</u>
Does the proponent consider methods of mitigating potential health impacts?	Not other than by comparison of accident risks and noise from project options.
a) Does the proponent identify and assess potential impacts on health care <b>facilities</b> due to a rise in population (increased employment)?	No. No permanent increase in population foreseen.
b) Due to potential health effects of normal discharges?	<b>As</b> above.
c) Due to potential health effects of accidental discharges?	<b>As</b> above
a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of contaminant release for employees?	No
b) For the affected public in the vicinity of the project?	<b>No</b>
Does the proponent plan a procedure for disposal of its wastes and its by-products to <b>minimize</b> potential environmental/human health impacts?	No
Does the proponent develop a means of monitoring ongoing human health effects during operation?	No

Nature of Project: Proposed Paper Mill

Country : Scot land

Date: 1986

Reason for ELA: To examine the environmental **implications** of the Planning Proposal by KAUKAS of Finland.

Produced by: Department of Planning Irvine Development Corporation

<u>Question</u>	<u>Answer</u>
Is a particular exposure period defined?	No
Is an area of impingement defined?	Yes. But only with regard to noise.
Have baseline studies been carried out, if so what are they?	Yes. But only with regard to noise.
Are critical subpopulations identified and potential health impacts identified?	Not specifically. Various housing concentrations are identified with noise levels.
Are potential health impacts that may occur in future generations examined?	No
a) Are health impacts to residents during construction assessed?	Yes. But only with regard to noise <b>eg.</b> piling, construction traffic.
b) Are health impacts to workers during construction assessed?	No
c) Are health impacts to residents and employees during project operation considered?	Yes. Health of public and employees covered briefly, even though it is only a general description of noise and air emission levels rather than actual human health effects.
Is animal test data or data from other locations used to identify potential health impacts?	Yes. Data from a sister mill in Finland is used extensively as a means of predicting potential emissions and impacts.
a) Does the proponent determine and assess potential acute, short-term impacts to human health?	Yes. But only with regard to noise during construction.
b) Potential, chronic long-term health impacts?	Not specifically. Mention is made of the various emissions etc but their effects in the long-term are not really discussed.
c) Potential positive health impacts?	No
Does the proponent involve the public in assessing potential human health impacts?	No. But because it is part of a Planning Application it is available for public consultation.

**Question****Answer**

Does the proponent examine existing exposure levels and assess the potential **cumulative effect of additional exposure caused by the proposed project?**

**Yes.** But only **with regard to noise.** The EIA spends most of **it6** time stating that all levels of emissions will be within legal guidelines.

**Does the proponent consider methods of mitigating potential health impacts?**

Yes. These are covered extensively for all aspects of the plant.

**a) Does the proponent identify and ~~assess~~ potential impacts on health care facilities due to a rise in population (Increased employment)?**

No

**b) Due to potential health effects of normal discharges?**

No

**c) Due to potential health effects of accidental discharges?**

No

**a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures **in** case of a contaminant release for employees?**

No

**b) For the affected public in the vicinity of the project?**

No

Does the proponent plan a procedure for disposal of its wastes and its waste by-products to **minimize** potential environmental/human impacts?

Waste **disposal is** covered sparingly le. all **wastes,emissions** etc will be dealt with in such a way as to remain within legal limits. Where **a site or method for dumping has not been found the descriptions are less detailed.**

Does **the proponent develop a means** of monitoring ongoing human health effects during operation?

No mention is made of monitoring of any kind.

Nature of Project: Siting of the European Demonstration **Fast** Reactor Fuel Reprocessing Plant (**EDRP**) at Dounreay, **Caithness**

Country: Scot land

Date: **1985**

Reason for EIA: Prepared in support of the outline Planning Application to Highland Regional Council

Prepared by: British Nuclear **Fuels and the United Kingdom Atomic Energy Authority**



QuestionAnswer

**Is a particular exposure period defined?**

Not specifically but rates of exposure to radiation are discussed.

**Is an area of impingement defined?**

Not specifically, although the surrounding area is mentioned regularly.

**Have baseline studies been carried out, If so what are they?**

Extensive baseline studies especially radiation levels have been carried out, these have usually been in association with the existing reactor.

**Are critical subpopulations identified and potential health impacts identified?**

Yes, children, **as they are most likely to be affected**, particularly with regard **to radiation in the food chain - milk etc.**

**Are potential health impacts that may occur in future generation<sup>6</sup> examined?**

**Yes. Suggests possible accumulation of radiation over a period of time although dismissed these as likely to be insignificant.**

**a) Are health Impacts to residents during construction assessed?**

**Yes noise, dust and vibration.**

**b) Are health impacts to worker<sup>6</sup> during construction assessed?**

No

**c) Are health impacts to residents and employees during project operation considered?**

Yes, effect<sup>6</sup> of noise, air emissions and radiation are predicted, based on existing data.

**Is animal test data or data from other locations used to identify potential health impacts?**

Yes, extensive data has been collected from the reactor already located on the proposed site.

**a) Does the proponent determine and assess potential acute, short-term impacts to human health?**

No, the effects of a short-term event **are not** really discussed although an extensive risk **analysis is undertaken.**

**b) Potential, chronic long-term impacts?**

**Yes, but in little detail.**

**c) Potential positive health impacts? No**

**Does the proponent involve the public in assessing potential human health impacts?**

An extensive (85 day) Public Enquiry was held to discuss<sup>6</sup> the whole proposal. At the present time attempts are being made to re-open the enquiry.

**Question****Answer**

Does the proponent examine existing **exposure level** and **assess the potential cumulative effect** of additional exposure caused by the proposed project?

Yes, for example naturally occurring radiation (from granite etc). Potential radiation accumulation in **soils, the food chain** etc are also assessed and generally dismissed as **insignificant**.

Does **the** proponent consider methods of mitigating potential health impacts?

Yes, extensive description of the methods of preventing radiation leaks. Also **some** mention of mitigation of **air** emissions (**SO<sub>2</sub>, NOx** etc) and **noise**.

a) **Does the proponent identify and assess potential impact on health care facilities due to a rise in population (increased employment)?**

No, but mention **is** made of the **extensive services** available eg. on site, medical, fire and accident.

b) **Due to potential health effects of normal discharges?**

No " "

c) **Due to potential health effects of accidental discharges?**

No " "

a) Does the proponent examine and develop accident scenarios and corresponding emergency response procedures in case of a contaminant release for employees?

Not specifically. Various possibilities are assessed but only by risk analysis. Response procedures are not covered thoroughly.

b) For the affected public in the vicinity of the project?

No

Does the proponent plan a procedure for disposal of its wastes and **its** waste by-products to **minimize** potential environmental/human health impacts?

Yes. **These are covered** extensively. States that all discharges will be within legal limits.

Does the proponent develop a means of monitoring ongoing health effects during operation?

Human health effects are not widely monitored but environmental levels, biological levels etc are widely covered.