

***NATURAL RESOURCES CONSERVATION***

***AUTHORITY***

***GUIDELINES FOR CONDUCTING  
ENVIRONMENTAL IMPACT ASSESSMENT***

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## ENVIRONMENTAL IMPACT ASSESSMENT

### 1. Section 1: General Guidelines

#### 1.1 Introduction

The production of goods and services to meet global population demands has occasioned a number of activities which have depleted the globe's natural resources and in several instances contributed to environmental degradation through pollution. These activities done in the pursuit of economic development have also caused the loss of several species of plants and animals and now threaten the existence of man himself, if left uncontrolled.

Recognition of the question of the globe's capacity to sustain these activities and the general environmental problems associated with them, which are common at the community, national, regional and international levels, led to a number of international conferences, (starting at Stockholm in 1972) treaties, conventions, and protocols on the management of the earth's resources in an effort to ensure sustainable economic development.

In 1987 the United Nations Environment Programme (UNEP) adopted a set of goals and principles on environmental impact assessment. (See Appendix 1) At the national level legislation has been enacted in almost every country. In 1991 Jamaica promulgated the Natural Resources Conservation Authority Act by which an Authority was established to provide for the management, conservation and protection of the natural resources of Jamaica. The regulations being promulgated under the NRCA Act take into consideration the UNEP Principles mentioned above. For example, the Section 9 Order provides a list of categories of activities that by their nature are or are not likely to have significant effects. This is in keeping with Principle 2.

While several cases can be cited both nationally and internationally, to illustrate the progressive degradation of the earth's natural resources, the implications for the quality of life of present and future generations has not always been obvious. As a result of the need to manage the environment and to control and regulate development and the activities which affect the environment, various environmental management policies, procedures, processes and tools have evolved. One such tool is the Environmental Impact Assessment (EIA).

The EIA is one of the most commonly used environmental management tools to integrate environmental concerns effectively in the development process. Unlike the environmental audit (EA), which is conducted on existing projects, the EIA is applied to new projects and the expansion aspects of existing projects. Section 10 of the NRCA Act gives the Authority the power to request from any applicant, for a permit under Section 9 of the Act, that an environmental impact assessment be conducted. The Authority also has power to request that the applicant furnish documents or information as the Authority thinks fit. Criteria for requesting this information may include the urgency, the level of technology employed in the operation of the project, and the likely adverse impacts to be expected from the project.

### **1.2 Definition - What is an EIA?**

An EIA is a study of the effects of a proposed action on the environment. In this regard the environment includes all relevant aspects of the natural and human resources. The EIA evaluates the expected effects on human health, the natural environment and on property. The study therefore requires a multi-disciplinary approach. It should be done very early at the feasibility stage of a project. In other words a project should be assessed for its environmental feasibility.

The EIA compares various alternatives by which the project could be realized and seeks to identify the one which represents the best combination of economic and environmental costs and benefits. Alternatives include location as well as methods, process technology and construction methods.

The EIA is based on predictions. It attempts to predict the changes in environmental quality which would result from the proposed project/action.

The EIA attempts to weigh environmental effects on a common basis with economic costs and benefits and finally it is a decision-making tool. The EIA is a procedure used to examine the environmental consequences, both beneficial and adverse, of a proposed development project and to ensure that these effects are taken into account in project design. EIA should be viewed as an integral part of the project planning process.

### **1.3 The Environmental Impact Assessment Process**

Once the decision is taken that an EIA is required, (NRCA Act Section 10 and Appendix 2) the study to be conducted usually involves the following steps:

1. Preliminary Activities including scoping or setting terms of reference for the EIA, selecting consultant (agent who would prepare the EIA) to do the EIA, review of existing legislation.
  2. Submission of Draft Terms of Reference to the NRCA for approval.
  3. Conducting the EIA study
    - 3.1 Collect background data and information
    - 3.2 Public Involvement
    - 3.3 Identify impacts in terms of magnitude and significance
    - 3.4 Socio-economic analysis of project effects/impact
    - 3.5 Recommend mitigation action for each impact identified
    - 3.6 Analysis of alternatives of the project - both economic and environmental
    - 3.7 Training requirements of the project
    - 3.8 Development of a monitoring programme plan
    - 3.9 The study should be documented in the EIA Report.
2. **Section 2: EIA Report**
- The EIA report should contain a brief introduction explaining the need for and context of the project. This document should have the following content, unless specified otherwise in the Terms of Reference and should be concise:
- Executive Summary
  - Policy, Legal and Administrative Framework
  - Description of the environment
  - Description of the Proposed Project in detail
  - Significant Environmental Impacts
  - Socio-economic analysis of Project Impacts

- Identification and Analysis of Alternatives
- Mitigation Action/Mitigation Management Plan
- Environmental Management and Training
- Monitoring Programme
- Public Involvement
- List of References
- Appendices including
  - . Reference documents, photographs, unpublished data
  - . Terms of Reference
  - . Consulting team composition
  - . Notes of Public Consultation sessions

### **2.1 Policy, Legal and Administrative Framework**

This section of the EIA Report describes the policy and legal basis within which the project may be implemented. Regulations and standards applicable to the project should be referred to.

### **2.2 Description of the Environment**

A checklist in Appendix 3 lists some factors which should be considered in describing the environment. This description of the environmental setting is a record of conditions prior to implementation of the proposed project. It is primarily a benchmark against which to measure environmental changes and to assess impacts.

### **2.3 Description of the Proposed Project**

This is a detailed statement of all the critical activities which will be involved in the proposed project including construction phase, start-up and commissioning through to operational phase of the facilities.

### **2.4 Significant Environmental Impacts**

Impact identification is a critical step in an EIA. The process usually consists of two stages. First an exhaustive list of all impacts including minor, short term, moderate, direct and indirect, is drawn up.

Then the manageable, significant impacts are selected, based on magnitude, significance, extent and special sensitivity, for further study.

Magnitude refers to the amount of change to be created by

the impact. For some impacts magnitude is calculated by computer modelling.

Significance refers to the actual effects. It looks beyond magnitude.

Extent refers to the area to be affected.

Quantification of impacts is a difficult technical aspect of an EIA. For some impacts the theoretical basis for computing the magnitude does not exist. Such impacts may have to be addressed in a qualitative way.

## **2.5 Socio-economic Analysis of Project impacts**

The socio-economic characteristics of the existing location should be identified. The impacts of the proposed project on the socio-economic environment should then be analysed. The analysis should include the use of land, the main economic activities e.g. tourism, agriculture, the social level within nearby communities, employment levels and the existence of archaeological or historical sites.

Impacts should be categorised in terms of positive and negative. Examples of negative impacts are conflicts between existing businesses and new project workers, potential pollutants discharged that have an adverse effect on a waterbody of economic importance, and creation of increase in fees to be charged for services which used to be free. Positive impacts include creation of jobs, decrease public health risks, upgrading of physical infrastructure, and training of workers.

## **2.6. Analysis of Alternatives**

All the alternatives taken into account in developing the project should be documented. For example, if the project were to be sited elsewhere, the impacts associated should be reviewed and the associated mitigation action and costs defined. Each alternative should be evaluated in respect of its potential environmental impact and capital and operating costs. The environmental losses and gains must be combined with the economic costs and benefits to give the full picture for each alternative.

An analysis of the "no action" alternative should be included.

## 2.7 Mitigation Action/Mitigation Management Plan

It is recognised that it is seldom possible to eliminate an adverse environmental impact altogether, but it is often feasible to reduce its intensity. This reduction is referred to as mitigation. For each potential adverse impact the plan for its mitigation at each stage of the project should be documented and its cost assessed. It is essential that these costs of mitigation be adequately assessed and be fully documented. This is very important in the selection of the preferred alternative.

In the case of beneficial impacts it should be demonstrated how these can be maximised.

## 2.8 Environmental Management and Training

This section should document how the environment will be managed during the implementation of the project both construction and operational phases. The training programme for employees of the facility should be outlined. This section should identify any institutional needs for implementing the recommendations of the EIA.

## 2.9 Monitoring Programme

A detailed environmental monitoring programme/plan should be described. The reasons for and the costs associated with the monitoring activities should be covered.

It should be noted that some details presented may change depending on the final designs after the EIA preparation and review. These changes must be submitted to and approved by the NRCA.

The monitoring programme should clearly state the:

- . institutional arrangements for carrying out the work
- . parameters to be monitored
- . methods to be employed
- . standards or guidelines to be used
- . evaluation of the results
- . schedule and duration of monitoring
- . initiation of action necessary to limit adverse impacts disclosed by monitoring
- . format and frequency of reporting

## 2.10 Public/Community Involvement

The non-governmental organizations (NGO's) and citizens in the community in which the project is proposed to be implemented should be given the opportunity to be involved in the EIA study. This can take two forms, direct involvement of the affected public and the inclusion of local knowledge and expertise in the environmental methodology. Local perceptions of the environment should be included in the computations in the quantifying of impacts and so on. Local perceptions can be used to differentiate between those impacts which are of major importance in the local context and those which are not.

The NGO's should include but be not limited to

- . Environmental NGO's
- . Chamber of Commerce
- . Service Clubs
- . Citizens Associations

They should be formally contacted in writing and be informed of the project. Comments should be sought from all parties who will be affected by the proposed action.

Information to be obtained from NGO's and community groups can be of invaluable assistance in providing approaches to problem solving and resolving conflicts. This information obtained as part of the public consultations should be documented in the EIA report.

Appendix 4 shows various public consultation methods that may be employed depending on the size of the audience, expertise required, and the problem solving value.

Apart from being directly involved in the actual EIA study the public maybe involved in the review of the EIA as indicated below at the discretion of the NRCA. Depending on the nature of the project, the EIA maybe the subject of a public presentation by the preparers of the EIA. At the end of the presentation the public is given thirty (30) days to send in written comments.

The EIA report format may vary for a specific project from the above depending on what is specified in the Terms of Reference.

### 3. **EIA Review**

The draft EIA report should be submitted to the NRCA for review. Appendix 5 is a flow chart which illustrates the review process. Government agencies other than the NRCA may be required to participate in the review, at the discretion of the NRCA. As mentioned earlier, public involvement in the review process is also at the discretion of the NRCA. The draft EIA report is distributed to organizations, such as the Parish Library, in the nearby location to the project site and a public presentation is arranged by the proponents and consultants.

Appendix 6 lists the projects which require a Permit in accordance with Section 9, of the NRCA Act

Appendix 7 is a set of Generic Terms of Reference for EIAs for Various Sectors.

**LIST OF REFERENCES**

1. Y. J. Ahmad and G. K. Sammy: Guidelines to Environmental Impact Assessment in Developing Countries UNEP Regional Seas Reports and Studies No. 85, UNEP, 1987.
2. Conrad Douglas and Associates: Natural Resources Conservation Authority Guidelines for the Preparation of an Environmental Impact Assessment - Draft, September 29, 1993.
3. World Bank Technical Paper Number 139: Environmental Assessment Source-book, Vol. I, Policies, Procedures and Cross-Sectoral Issues - Environment Department, World Bank, Washington D.C., December 1991.
4. Municipal Engineers Association of Ontario: Class Environmental Assessment for Municipal Road Projects, Chapter 5 - Public Consultation June 1993.
5. Goals and Principles of Environmental Impact Assessments [Adopted by decision 14/25, of the Governing Council of UNEP, of 17 June, 1987] Chapter IV.

**APPENDIX 1****GOALS AND PRINCIPLES OF ENVIRONMENTAL IMPACT  
ASSESSMENT PRELIMINARY NOTE****Environmental Impact Assessment (EIA)**

EIA means an examination, analysis and assessment of planned activities with a view to ensuring environmentally sound and sustainable development.

The EIA goals and principles set out below are necessarily general in nature and may be further refined when fulfilling EIA tasks at the national, regional and international levels.

**GOALS**

1. To establish that before decisions are taken by the competent authority or authorities to undertake or to authorize activities that are likely to significantly affect the environment, the environmental effects of those activities should be taken into account.
2. To promote the implementation of appropriate procedures in all countries consistent with national laws and decision-making processes, through which the foregoing goal may be realized.
3. To encourage the development of reciprocal procedures for information exchange, notification and consultation between States when proposed activities are likely to have significant transboundary effects on the environment of those States.

**PRINCIPLES****Principle 1**

States (including their competent authorities) should not undertake or authorize activities without prior consideration, at an early stage, or their environmental effects. Where the extent, nature or location of a proposed activity is such that it is likely to significantly affect the environment, a comprehensive environmental impact assessment should be undertaken in accordance with the following principles.

**Principle 2**

The criteria and procedures for determining whether an activity is likely to significantly affect the environment and is therefore subject to an EIA, should be defined clearly by legislation, regulation, or other means, so that subject activities can be quickly and surely identified, and EIA can be applied as the activity is being planned.

**Principle 3**

In the EIA process the relevant significant environmental issues should be identified and studied. Where appropriate, all efforts should be made to identify these issues at an early stage in the process.

**Principle 4**

An EIA should include, at a minimum:

- (a) A description of the proposed activity;
- (b) A description of the potentially affected environment, including specific information necessary for identifying and assessing the environmental effects of the proposed activity;
- (c) A description of practical alternatives, as appropriate;
- (d) An assessment of the likely or potential environmental impacts of the proposed activity and alternatives; including the direct, indirect, cumulative, short-term and long-term effects;
- (e) An identification and description of measures available to mitigate adverse environmental impacts of the proposed activity and alternatives, and an assessment of those measures;
- (f) An indication of gaps in knowledge and uncertainties which may be encountered in compiling the required information;
- (g) An indication of whether the environment of any other State or areas beyond national jurisdiction is likely to be affected by the proposed activity or

alternatives.

- (h) A brief, non-technical summary of the information provided under the above headings.

**Principle 5**

The environmental effects in an EIA should be assessed with a degree of detail commensurate with their likely environmental significance.

**Principle 6**

The information provided as part of EIA should be examined impartially prior to the decision.

**Principle 7**

Before a decision is made on an activity, government agencies, members of the public, experts in relevant disciplines and interested groups should be allowed appropriate opportunity to comment on the EIA.

**Principle 8**

A decision as to whether a proposed activity should be authorized or undertaken should not be taken until an appropriate period has elapsed to consider comments pursuant to principles 7 and 12

**Principle 9**

The decision on any proposed activity subject to an EIA should be in writing, state the reasons therefor, and include the provisions, if any, to prevent, reduce or mitigate damage to the environment.

This decision should be made available to interested persons or groups.

**Principle 10**

Where it is justified, following a decision on an activity which has been subject to an EIA, the activity and its effects on the environment or the provisions (pursuant to Principle 9) of the decision on this activity should be subject to appropriate supervision.

**Principle 11**

States should endeavour to conclude bilateral, regional or multilateral arrangements, as appropriate, so as to provide, on the basis of reciprocity, notification, exchange or information, and agreed-upon consultation on the potential environmental effects of activities under their control or jurisdiction which are likely to significantly affect other States or areas beyond national jurisdiction.

**Principle 12**

When information provided as part of an EIA indicates that the environment within another States is likely to be significantly affected by a proposed activity, the State in which the activity is being planned should, to the extent possible:

- (a) notify the potentially affected State of the proposed activity;
- (b) transmit to the potentially affected State any relevant information from the EIA, the transmission of which is not prohibited by national laws or regulations; and
- (c) When it is agreed between the States concerned, enter into timely consultations.

**Principle 13**

Appropriate measures should be established to ensure implementation of EIA procedures.

APPENDIX 3

**BASIC CHECKLIST WHICH CAN BE USED TO COMPILE THE  
DESCRIPTION OF THE ENVIRONMENTAL SETTING**

1. **Basic Land Conditions**

a. **Geological Conditions**

Major land formations (valleys, rivers)

Geologic structures (sub-strate, etc.)

Geologic resources (minerals, oil, etc.)

Seismic hazards (faults, liquefaction, tidal wave etc.)

Slope stability and landslide potential

b. **Soil Conditions**

Soil conservation service, classification

Hazard potential (erosion, subsidence or expansiveness)

Natural drainage rate

Sub-soil permeability

Run-off rate

Effective depth (inches)

Inherent fertility

Suitability for method of sewage disposal

c. **Archaeological value of site**

2. **Biotic Community Conditions**

a. **Plant**

General type and dominant species

Densities and distributions  
Animal habitat value

Historically important specimen

Watershed value

Man-introduced species

Endangered species (location, distribution and conditions)

Fire potential (chaparral, grass, etc.)

Timber value

Specimen of scientific or aesthetic interest

b. **Animal**

General types/dominant species (mammal, fish, fowl, etc.)

Densities and distribution

Habitat (general)

Migratory species

Game species

Man-introduced species (exotic species)

Endangered species

Commercially valued species

3. **Watershed Conditions**

Water quality (ground water and surface water)

Source of public or private water supply on-site

Watershed importance (on-site and surrounding area)

Flood plain importance (on-site and surrounding area)

Water run-off rate

Streamside conditions (habitat conditions and stream flow

rate)

Location of wells, springs

Marshlands, lakes, ocean frontage importance

4. **Airshed Conditions**

General climatic type

Air quality

Airshed Importance

Wind hazard area (min/max speeds)

Odour levels

Noise levels

Rainfall (average)

Temperature (average highs and lows)

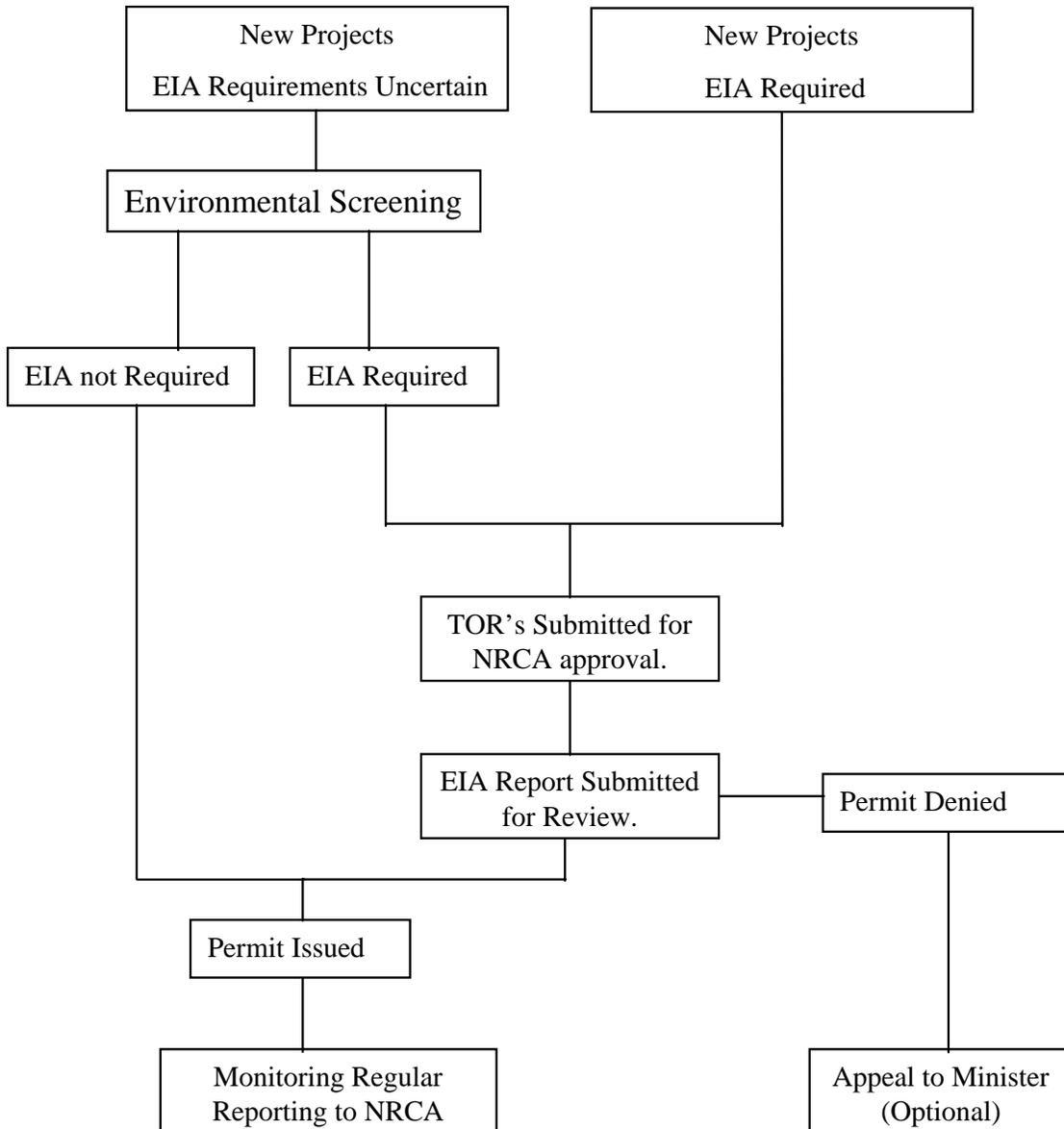
Prevailing winds (direction and intensity)

Fog conditions (hazard potential)

APPENDIX 2

**STEPS IN THE REVIEW OF EIAs**

**AND POST PERMIT GRANTING ACTIVITIES**



APPENDIX 2

Description or Category of Enterprise, Construction or Development which require Environmental Impact Assessment, NRCA Act Section 38(1) (b)

- Industrial projects
  - \* power generation plants
  - \* electrical transmission lines and substations 115 KV or greater
  - \* chemical manufacturing plants
  - \* wood pulp and paper processing
  - \* paint manufacture
  - \* petroleum refinery
  - \* food processing large scale
  - \* fish and meat processing, large scale
  - \* tanneries
  - \* electroplating/metal planting
  - \* ferrous and non-ferrous metal processing
  - \* mining and mineral processing
    - bauxite
    - peat
    - sand, minerals
  - \* detergent manufacture
  - \* distillery
  - \* cement and lime production
  - \* textile manufacture
  - \* pesticide or other hazardous or toxic substances manufacture
- Development projects
  - \* subdivisions of 10 or more lots
  - \* housing projects of 10 houses or more
  - \* highway and road construction or remodelling
  - \* railway lines
  - \* hotel/resort complex of 12 rooms or more
  - \* airports including runway expansion greater than 20%
  - \* harbour and port including dredging
  - \* office complex >5000 sq. metres
  - \* pipelines and conveyors >15 cm including underground cables, gas line
  - \* construction of new highways, arterial roads and major road improvement
  - \* river basin development projects
- Other projects
  - \* cemeteries and crematoriums
  - \* solid waste treatment and disposal facility including

agricultural waste

\* water treatment facilities (water supply, desalination plants  
sewage and industrial waste water)

\* hazardous waste storage, treatment and disposal facilities

**N.B.** PROJECTS NOT LISTED ABOVE MAY REQUIRE AN EIA BEFORE A  
PERMIT IS GRANTED.