

# REVISED DRAFT FOR APPROVAL

## Terms of Reference Environmental Impact Assessment for the proposed Ethanol Plant, Port Esquivel, St. Catherine

**Submitted to:**

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# TERMS OF REFERENCE for an ENVIRONMENTAL IMPACT ASSESSMENT

## INDUSTRIAL PROJECTS: PETROLEUM PRODUCTION, REFINERY, STORAGE & STOCKPILING,

*Sites of special consideration applicable to the proposed development include:*

**Coastal Areas:** Issues such as coastline stability, potential direct impacts to coral reef, mangrove and wetland, seagrass systems, unique coastal environments, nutrient loading and the sedimentation of coastal waters and consequent impact on coastal commercial fishing should be examined. The handling of raw materials, waste and wastewaters and their impact on coastal waters should be closely examined as well.

**Freshwater/ Riverine/ Wetland Areas:** Important Issues include the possibility of leachate being introduced to the water column, erosion and siltation, nutrient loading, and macro-invertebrate habitat destruction. The possible increase in mortality rate of overall aquatic life due to improper waste handling should be considered.

**Sites located within and adjacent to areas listed as protected or having protected species:** The main issue(s) of concern are determined by the statutes of the convention in question and what the convention speaks to. The site is located within the Portland Bight Protected and as such any impact of the development on the specific sensitivities of the protected area will be considered. Mitigation of impacts should assess if the post mitigation status would be acceptable in the protected area context.

The socio – economic aspects of the development will be highlighted as the type and location of processing facilities frequently have an impact on property values and on communities' perceptions of a healthy environment.

Special consideration will be given to the risk factors associated with fires, oil spills and spills of hazardous materials. Management of oil spills and their immediate and long term impacts on the environment will be considered.

## Terms of Reference

The Environmental Impact Assessment will:

- 1) Provide a comprehensive description of the existing site proposed for project implementation. Detail the elements of the project, highlighting areas to be modified and the areas which are to be preserved in their existing state.
- 2) Identify the major environmental issues of concern through the presentation of baseline data which should include social and cultural considerations. Assess public perception of the proposed development.
- 3) Outline the Legislation and Regulations relevant to the project.
- 4) Predict the likely impacts of the development on the described environment, including direct, indirect and cumulative impacts, and indicate their relative importance to the design of the development's facilities.
- 5) Identify mitigation measures to be taken to minimise adverse impacts and quantify associated costs.
- 6) Design a Monitoring Plan which should ensure that the mitigation plan is adhered to.
- 7) Describe the alternatives to the project that could be considered at that site

To ensure that a thorough Environmental Impact Assessment is carried out, it is expected that the following tasks be undertaken:

### **Task #1. Description of the Project**

Provide a comprehensive description of the project, noting areas proposed for refining operations and waste management. Detail the elements of the project, highlighting areas to be reserved for construction, areas for raw materials and product storage, areas to be preserved in their existing state as well as activities and features which will introduce risks or generate impact (negative and positive) on the environment. This should involve the use of maps, site plans, aerial photographs and other graphic aids and images, as appropriate, and include information on location, general layout and size, timing and duration as well as pre-construction, construction, and post construction plans. A description of the processes to be utilized in the production of the ethanol will be given. If the project will be done on a phased basis all phases will be clearly defined, the relevant time schedules provided and phased maps, diagrams and appropriate visual aids will be included.

### **Task #2. Description of the Environment**

Baseline data will be generated to describe the existing site and study area as follows:

- i) physical environment
- ii) biological environment
- iii) socio-economic and cultural environment

Methodologies employed to obtain baseline and other data will be clearly detailed.

Baseline data should include:

### ***(A) Physical***

- i) A detailed description of the existing **geology** and **hydrology**. Special emphasis should be placed on storm water run-off, drainage patterns, effect on groundwater and availability of potable water. Depth to ground water and subsurface flow regime will be discussed. Any slope stability issues that could arise should be thoroughly explored.
- ii) **Water quality** of any existing wells, rivers, ponds, streams or coastal waters in the vicinity of project activities. Quality Indicators should include but not necessarily be limited to nitrates, phosphates, faecal coliform, oil and grease, and suspended solids. Historical data will be referred to where appropriate and current data will be generated in order to establish baseline conditions.
- iii) **Climatic conditions and air quality** in the area of influence, including particulate emissions from stationary or mobile sources, NO<sub>x</sub>, SO<sub>x</sub>, wind speed and direction, precipitation, relative humidity and ambient temperatures,
- iv) **Noise** levels of the undeveloped site and the ambient noise in the area of influence, including influences from neighbouring and adjacent facilities.
- v) Obvious sources of existing pollution and extent of contamination.
- vi) Availability of solid waste and wastewater management facilities.

### ***(B) Biological***

Present a detailed description of the flora and fauna (terrestrial and aquatic) of the area, with special emphasis on rare, endemic, protected or endangered species. Migratory species should also be considered.

Species dependence, niche specificity, community structure, species richness, and biodiversity will be discussed.

***(C) Socio-economic & cultural***

Present and projected population; present and proposed land use; planned development activities, community structure, employment, distribution of income, goods and services; recreation; public health and safety; cultural peculiarities, aspirations and attitudes should be explored. The historical importance of the area should also be examined. Infrastructure and utilities will be assessed including the existing road network, water supply and electricity. While this analysis is being conducted, an assessment of public perception of the proposed development will be conducted. This assessment may vary with community structure and may take multiple forms such as public meetings or questionnaires. A consultation will be held with the medical officer (Health) St. Catherine Health Department to apprise him of the proposed development, to discuss the public health implications of the development and to identify strategies for protecting public health.

**Task #3 - Legislative and Regulatory Considerations**

Outline the pertinent regulations, policies and standards governing environmental quality, safety and health, protection of sensitive areas, protection of endangered species, siting and land use control at the national and local levels. The examination of the legislative and regulatory instruments should include at minimum, legislation such as the NRCA Act, the Wild Life Protection Act, Watershed Protection Act, the Public Health Act, the Clean Air Act, the Town and Country Planning Act, the Petroleum Act, the National Solid Waste Management Authority Act the St. Catherine Coast Development Order, the South Coast Sustainable Development Master Plan and the appropriate international conventions/protocols/treaties where applicable. The National Energy Policy will also be considered.

#### **Task #4 - Identification of Potential Impacts**

Identify the potential impacts of the proposed development on environmental and public health issues and indicate their relative importance to the design of the project and the intended activities. A description will be given of the types and characteristics of input chemicals, their byproducts and other chemicals and the impact on public health and the environment.

Potential impacts will be identified for the construction and operation phases, as they relate to, (but are not restricted by) the following:

- change in drainage pattern
- flooding potential
- landscape impacts of excavation and construction
- loss of natural features, habitats, niches and species
  
- pollution of surface and ground water
- air pollution
- socio-economic and cultural impacts.
- risk assessment
- noise
- change in soil pH
- possible improper or accidental waste disposal via discharge into drainage lines, sewers and water bodies
- capacity and design parameters of waste treatment facilities
- proper disposal/treatment of potentially hazardous compounds
- handling and storage of raw materials and product
- solid waste management
- liquid waste management
- traffic
- infrastructure

Distinguish between significant positive and negative impacts, direct and indirect, long term and immediate impacts. Identify avoidable as well as irreversible impacts, and cumulative impacts, including the cumulative impact of gaseous discharge on air quality within the area of influence. Characterize the extent and quality of the available data, explaining significant information deficiencies and any uncertainties associated with the prediction of impacts.

The impact of the development on health, including the potential public health risks associated with the development, and the potential long-term impact on community health status will be discussed and mitigation measures presented. A risk assessment will be presented to include fires and explosions, and plant safety will be discussed in the context of an accident analysis. Coastal impacts will be discussed and include the potential for storm surge, pollution of the marine environment, and spill management (as it affects the terrestrial and marine environment).

#### **Task #5 Mitigation**

Prepare guidelines for mitigating, as far as possible, any adverse impacts due to proposed usage of the site and utilizing existing environmental attributes for optimum development where practical and feasible. Mitigation methods will include response mechanisms to ensure that potential spills are quickly cleaned up and ensure limited introduction of ethanol to the environment in the case of spills, and site remediation in the case of spills, if required. Reference will be made to potential spills or accidents during the transportation stage. Recommendation will be made for the preparation of a Fire Management Plan to be submitted to NEPA before the operational phase of the project. Quantify and assign financial and economic values to mitigation methods where appropriate.

#### **Task #6 - Monitoring**

Design a plan to monitor the implementation of mitigation or compensatory measures and project impacts during construction and operation. An Outline Environmental Management Plan for the long term operations of the site should also be prepared, and should include monitoring for leak detection and response.

Air shed monitoring may be required to predict air quality where emissions of significant quantities of air pollutants are anticipated. This will be guided by the NRCA draft air quality regulations.

An Outline Monitoring Programme will be included in the EIA, and a detailed version submitted to NEPA for approval after the granting of the permit and prior to the commencement of the development. At the minimum the monitoring programme and report should include:

- Introduction outlining the need for a monitoring programme and the relevant specific provisions of the permit license(s) granted.
- The activity being monitored and the parameters chosen to effectively carry out the exercise.
- The methodology to be employed and the frequency of monitoring.
- The sites being monitored. These may in instances, be pre-determined by the local authority and should incorporate a control site where no impact from the development is expected.
- Frequency of reporting to NEPA

The Monitoring report should also include, at a minimum:

- Raw data collected. Tables and graphs are to be used where appropriate
- Discussion of results with respect to the development in progress, highlighting any parameter(s) which exceeds the expected standard(s).
- Recommendations
- Appendices of data and photographs if necessary.

### **Task #7 - Project Alternatives**

Examine alternatives to the project including the no-action alternative. This examination of project alternatives should incorporate the use history of the overall area in which the site is located and previous uses of the site itself.

All Findings will be presented in the **EIA report** and will reflect the headings in the body of the TORs, as well as references. Eight hard copies and an electronic copy of the report should be submitted. The report should include an appendix with items such as maps, site plans, the study team, photographs, and other relevant information.

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