

## **LIST OF ANNEXES**

## **ANNEX I**

### **TERMS OF REFERENCE**

# **TERMS OF REFERENCE AND FORMAT FOR AN ENVIRONMENTAL IMPACT ASSESSMENT TO BE PREPARED FOR**

## **CHRYSALIS RESORT LIMITED**

### **A PROPOSED TOURISM DEVELOPMENT PROJECT AT BIG CHANNEL CAYE AND LITTLE CHANNEL CAYE OFFSHORE STANN CREEK DISTRICT**

This Terms of Reference (TOR) has been prepared following the scoping for the most critical issues that will need to be addressed by the proposed development.

In the preparation of the Environmental Impact Assessment (EIA), the EIA preparers will need to focus on addressing the main areas of concern, such as:

- **POTENTIAL IMPACTS ON COASTLINE DUE TO DREDGING;**
- **POTENTIAL IMPACTS TO AQUATIC FLORA AND FAUNA (PRE AND POST-CONSTRUCTION);**
- **POTENTIAL IMPACTS TO WATER QUALITY OF THE AREA;**
- **IMPACTS ASSOCIATED WITH BOAT RELATED ACTIVITIES;**
- **PROVISION OF POTABLE WATER SUPPLY;**
- **ENERGY GENERATION;**
- **SOCIO-ECONOMIC FACTORS.**

Scoping of these issues speeds up the ENVIRONMENTAL IMPACT ASSESSMENT process, cuts down its cost, improves the quality of the development and ensures that environmental concerns are clearly addressed.

This Terms of Reference (TOR) is divided into three (3) sections:

#### **A. PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT**

This section of the document deals primarily with information pertaining to the background of the project and the physical environment within which it is proposed. The EIA will need to address:

##### **1.0 THE PROJECT DESCRIPTION AND LAYOUT PLAN**

Maps at appropriate scales must be provided and with proper labels and legends to illustrate the general settings of project related development sites as well as surrounding areas likely to be affected. These maps shall include topographic contours, where available, as well as location of major surface waters, reserves, political boundaries and existing adjacent land uses (tourism, agricultural, industrial). Additionally the following should be provided:

- 1.01 Give the exact location of the project and provide proof of ownership of the parcel of land comprising the project site. Include a copy of the land tenure documents in the EIA Report.
- 1.02 Describe the following characteristics of the proposed development:
- a. Provide a scale layout plan for the overall development, including siting of all facilities such as utilities, water treatment facilities, sewage treatment facilities, storage facilities, drainage facilities, cabañas, access channel, dredge/burrow sites, administrative buildings/complexes, garbage storage/treatment facilities, restaurant, piers, docking facilities.
  - b. The physical plan for development, including the siting and rationale of all facilities and infrastructure.
- 1.03 Describe briefly the facilities provided in the plans above (1.02 a and 1.02 b)
- 1.04 Provide specifications and detailed designs for the following:
- a. Collection and disposal systems for solid waste;
  - b. Sewage collection, disposal and treatment systems;
  - c. Potable water source, treatment and distribution systems;
  - d. Canalization;
  - e. Dredge works;
  - f. Energy Generation
- 1.05 Provide an outline of the overall management structure anticipated for the proposed development.
- 1.06 Describe the implementation of the project in phases (if applicable).

## **2.0 THE PHYSICAL ENVIRONMENT**

- 2.01 Provide details of the basic physical environment of the project site and zone of influence. This should include:
- Location of the project with respect to other land masses and any protected areas/marine reserves.
  - Topography: Include the flood hazard and drainage patterns around the project site;
  - Climate, hydrology and meteorology: Include the rainfall average per year, prevailing wind patterns and susceptibility to natural disasters (i.e. hurricanes, tropical storms and flooding);

- Geology:
  - o Geomorphology – Give a detailed description of the characteristics of landforms, including a detailed description of the land surface which should include exposed rock types, types of unconsolidated materials exposed (sediments), ridges, valleys, and geological structures – faults and folds, (if they can be determined by field mapping).
  - o Subsurface geology – Give a detailed description of the stratigraphy of rocks or unconsolidated materials within the project site, including depths for the protection of the water table. This must be done using core sampling, (mechanical or manual), by means of a pre-determined borehole grid. Cross sections of the rock types or unconsolidated materials should also be presented. The physical properties of the rocks and/or unconsolidated materials must be tested (particularly the permeability and percolation rates) to determine the suitability for the proposed development
- Soils: Give the fertility, permeability, agricultural value and classification, and the potential for erosion of the soils on the project site;
- Current land use of the project site and adjacent properties;
- Physical, biological and ecological description of surrounding receiving water bodies including lagoon and sea front and their relation to any protected areas or marine reserves within the zone of influence;
- Vegetation type (s).

### **3.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

Describe the pertinent regulations, standards and policies, at the local and national levels, governing environmental quality, health and safety and protection of sensitive areas. These could include cultural resources, protection of endangered or threatened species, siting, infrastructure development, land use control and tourism that may have an impact on the proposed development.

- 3.01 Provide any policy, legal or administrative issues that may have an impact on the proposed development.

## **B. ENVIRONMENTAL ISSUES**

This section of the document primarily targets the environmental issues of critical concerns based on information provided in section A.

The following are the critical issues a high quality Environmental Impact Assessment will need to address in evaluating the Exquisite Limited Resort.

The Study will need to address:

### **1.0 FLORA AND FAUNA**

For the project site and the zone of influence:

- 1.01 Collect base line data (field study) on the terrestrial and aquatic fauna and flora including coral structures, sea grass beds, mangrove cover; rare or endangered species or commercially valuable species within or in areas adjacent to the project site (both terrestrial and aquatic); sensitive habitats within or adjacent to project site and effluent receiving water bodies. This should provide a baseline from which to detect any changes in the abundance and vigor of the species due to this development.
- 1.02 Provide a general description of the methodology used to collect baseline data this is to include the date, time, area surveyed and methodology used.
- 1.03 Estimate the acreage and type of vegetation within the development site designated for removal as well as the percent of vegetation, to be removed, taking into consideration the establishment of appropriate buffer zones along all permanent water bodies on site.
- 1.04 Identify any species of conservation significance (threatened and endangered species), such as manatees, crocodiles, turtles, etc., and specify detailed measures for their protection, which may include the establishment of reserves within the project site.
- 1.05 Highlight, where appropriate, measures that could be taken to enhance the habitat value of the project area.
- 1.06 Map terrestrial habitats at 1:15,000, including mangrove and vegetation cover classes and communities, natural drains, etc. This should incorporate clear indicators of percent cover and habitat composition and health.

## 2.0 WATER RESOURCES

- 2.01 Determine the projected water needs for the entire development (including drinking water supply, domestic/household supply, irrigation of landscape, pool/spa, etc.).
- 2.02 Assess all sources of water supply, quality and quantity, paying special attention to determining the safe maximum sustainable yield it can provide. If surface or ground water sources are intended for potable use, water quality assessments of the intended sources should be conducted, as follows:
- 2.02. Collect a minimum of three (3) different water quality data sets (preferably three separate months) on the water sources identified above. This data should include the following parameters:
- |                                  |                     |
|----------------------------------|---------------------|
| i. Temperature,                  | vii. pH             |
| ii. Dissolved Oxygen             | viii. Alkalinity    |
| iii. Salinity                    | ix. Ammonia         |
| iv. Total Coliform Count         | x. Phosphorus       |
| v. <i>Escherichia coli</i> Count | xi. Turbidity       |
| vi. Chemical Oxygen Demand       | xii. Total Nitrogen |
- (Assays I, ii & iii, to be conducted in the field and the remainder to be conducted preferably by an independent water quality consultant. The water quality analyses should contain the official stamp of the laboratory (if any) and the signature of the technician).
- 2.03 Identify the preferred option for water supply needs, based on environmental grounds. Specify any residual impacts of meeting water needs through this option, the significance, and any mitigatory measures to be undertaken. Provide detailed information for any water treatment processes that may be employed to obtain the required volumes of potable water for the entire development.
- 2.04 Given the results from above, evaluate a minimum of three (3) alternative options for the provision of water supply for the entire development.
- 2.05 Identify and develop a water quality monitoring programme able to detect any change in ground water or surface water quality, or the water quality of the proposed effluent receiving water body (if any) that could impact:
- o Public health
  - o Forest, wetland and adjacent aquatic habitats; and
  - o Endangered or threatened species in project area and zone of influence

### **3.0 SOLID WASTE GENERATION**

- 3.01 Determine the projected types and volumes of solid waste to be produced by the entire development. This should examine oil, tyres, plastics, metals, putrescible wastes, batteries/hazardous materials and construction wastes, at minimum. It will also need to include solid wastes from boats and other transportation vehicles. If composting of organic wastes is to be conducted, provide specifications on the location of the site and procedures to be followed for the composting.
- 3.02 Discuss the various alternatives/options that could be incorporated or used by the development; inclusive of the various mitigative measures for each alternatives/options.

### **4.0 GEOLOGY AND EXTRACTION OF MATERIALS**

- 4.01 Provide information on the specific soil type and submit results of analysis carried out to determine soil permeability/profile in the proposed project area.
- 4.02 Provide the soil profile of at least three bores of a diagonal transect of the property.
- 4.03 Determine the type and volume of construction materials required for the entire development.
- 4.04 Determine the following for the dredging/excavation requirements for the project.
  - 4.04.1 Disposal/use of dredged materials;
  - 4.04.2 Physical character of materials to be dredged;
  - 4.04.3 Type of dredging equipment/method of dredging;
  - 4.04.4 Need for shoreline protection;
- 4.05 Determine the need for mining and impacts associated with the construction of the docking facility (if any).
- 4.06 Evaluate options for meeting the requirements of the Geology and Petroleum Department with respect to mining/quarry licences/permits including reviewing the sources, volume, extraction methods and transportation as well as identifying:
  - 4.06.1 Direct and indirect biological impacts on flora and fauna especially coral structures and marine flora and fauna in the project area
  - 4.06.2 Direct and indirect physical impacts (eg. Sea grass beds, mangroves, fauna)
  - 4.06.3 impact on receiving water bodies, Caribbean Sea, and mangrove wetlands.
  - 4.06.4 specific mitigation measures for the above mentioned.

- 4.07 Identify the preferred option for the extraction methods, source and transportation of materials, specifying the necessary mitigation measures, their residual impacts and significance.
- 4.08 evaluate options for the supply of fuel to boats and identify the best method for eliminating potential oil spillages and maximizing health and safety (if applicable). This should include options for the proper storage of the fuels.

## **5.0 ENERGY GENERATION**

- 5.01 Determine the projected energy requirements for the entire development.
- 5.02 Evaluate a minimum of three (3) alternative options for meeting these needs, using fossil fuel, solar, wind resources (and others if appropriate). For each of these options, it will be necessary to investigate:
  - 5.02.1 Fuel storage (where relevant);
  - 5.02.2 Transportation (where relevant);
  - 5.02.3 Health and safety;
  - 5.02.4 Pollution sources, volumes, and types;
  - 5.02.5 Significance of any pollution that may result from energy generation; and
  - 5.02.6 Mitigatory measures to be implemented.
- 5.03 Select the preferred option(s) for energy generation. This should be based on environmental grounds and should specify the residual impacts of generation of the preferred option, its significance and the mitigation measures to be undertaken.

## **6.0 ARCHAEOLOGY**

- 6.01 Contact the Institute of Archaeology with respect to addressing any issue pertaining to archaeological, historical and/or cultural significance in and around the project area. Any findings and/or recommendations should be incorporated in the EIA.

## **7.0 DISASTER MANAGEMENT AND CLIMATE CHANGE ISSUES**

- 7.01 Identify emergency preparation, response and applicable management measures for the proposed development (e.g. hurricane, floods, fires etc.). This should include evacuation and hazard management plans inclusive of climate change adaptation measures (such as sea level rise and structural/building design conducive with the climatic conditions of project site).

## **C. POTENTIAL CUMULATIVE IMPACTS**

- 1.0 Identify all potential cumulative impacts and significant changes that may result from the implementation of this overall project. This should include, but not be limited to, changes in the following:

- (a) Water Quality of the area;
- (b) Current patterns and hydrographic characteristics;
- (c) Socio-cultural environment; and
- (d) Abundance of flora and fauna.

- 2.0 The above analysis should distinguish between significant positive and negative impacts; direct and indirect impacts; immediate, medium and long-term impacts, irreversible or unavoidable impacts and identify impacts that may result from accidental events (i.e. oil/fuel spills, accidental release of untreated wastewater/effluent, etc.). This analysis should be divided into construction, operational and maintenance activities / phases.
- 3.0 Characterize the extent and quality of available data, explaining significant information deficiencies (gaps) and uncertainties associated with the prediction of such potential impacts.

## **D. CONCLUSION/RECOMMENDATIONS**

**This section discusses the potential impacts (both positive and negative) and proposes alternatives to the execution of the project based on the information generated by Section B.**

### **1.0 ALTERNATIVES FOR DEVELOPMENT**

- 1.01.1 Present all reasonable alternatives for development in comparative form, exploring each alternative. Include the 'no-action' alternative and the reason why certain alternatives were recommended or eliminated. These alternatives should look at the following components:
- 1.01.2 Siting of the necessary support infrastructure and all facilities;
- 1.01.3 Earth Movement Activities (evaluate the different extraction/dredging methodologies, extraction/dredging points (burrow sites), extraction/dredging volumes, material fill sites etc.)
- 1.01.4 Liquid and solid waste treatment and disposal options (evaluate the different treatment technologies and methodologies).
- 1.01.5 Boat Storage and marina/docking facilities (siting, design, etc.)

### **2.02 MITIGATION AND MONITORING PLANS**

- 2.02.1 Based on the investigations, develop a mitigation matrix outlining mitigation measures for all potential negative environmental impacts including, but not limited

to, construction activities, waste treatment and disposal, habitat alteration and erosion control, and management of pests and vectors (rodents, mosquitoes, flies, etc.),.

2.02.2 Provide a detailed monitoring plan to be implemented for the entire operation, identifying any agency/body responsible for its implementation and any training that may be necessary for the implementation of the plan. The plan should include monitoring of wastewater discharge characteristics (if any), changes in ecological species (including endangered species), contingency measures to emergency response to accidental events (fire, flood, hurricane, leakages, spillages, etc.).

2.02.3 Provide a detailed plan for the decommissioning and rehabilitation of the site to other uses in the event that the project is discontinued.