

CERTIFICATE OF ENVIRONMENTAL CLEARANCE RULES

Draft Terms of Reference for the Environmental Impact Assessment in respect of:

Application for a Certificate of Environmental Clearance by Ministry of Works and Transport for the establishment of a Marina and related Marina facilities at Friendship Estate, Canaan, Tobago.

Application Reference: CEC6342/2021

INTRODUCTION

The Environmental Management Authority (EMA) received an application for a Certificate of Environmental Clearance (CEC) from the Ministry of Works and Transport ('the Applicant') on December 23, 2021 for the proposed establishment of a marina and related marina facilities at Friendship Estate, Canaan, Tobago. The application was made in accordance with the CEC Rules and Activities 8(a), 9, 11, 12, 13(a), 13(b), 13(c), 18(a), 29, 31(a), 34, 35, 40(a), 40(b), 41(a), 42 and 43(c) of the CEC (Designated Activities) Order (as amended).

The EMA has determined that it is likely that significant environmental impacts can arise from this proposed project, which requires a CEC. As such, an Environmental Impact Assessment (EIA) must be undertaken to allow for an informed CEC determination. EIAs must be undertaken in compliance with a Terms of Reference (TOR) which is prepared by the EMA in consultation with the Applicant. The purpose of the TOR is to guide the conduct of the EIA and the preparation of the EIA Report, which must describe the proposed project; identify and, where appropriate, quantify potential impacts and explain measures to be taken to mitigate any significantly negative impacts.

This Notice and the Annexes relating to it, form the TOR for conducting the EIA required in respect of the proposal described above. Every attempt has been made to ensure that this TOR addresses all of the major issues associated with this proposal. However, it is not exhaustive and should not be interpreted as excluding matters deemed to be significant but not incorporated within it, or matters (currently unforeseen) that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIA.

An outline of the EMA's understanding of the proposed project is set out in **Annex 1**.

It should be noted that the preparation of the TOR for this EIA does not indicate approval or support in any way, nor does it indicate approval in principle for the proposed activities.

LEGAL FRAMEWORK

The CEC Rules were developed under section 26(h) of the Environmental Management Act, Chapter 35:05 (EM Act) and came into effect on July 7, 2001. The CEC (Designated Activities) Order (as amended) outlines a list of activities that require a CEC. No person shall proceed with any activity as listed within the Designated Activities Order unless such person applies for and receives a CEC from the EMA.

The proposed project to which this TOR relates is consistent with the following designated activities:

ACTIVITY		DEFINITION
8	Clearing, excavation, grading and land filling	(a) The clearing, excavation, grading or land filling of an area of more than two hectares during a two-year period;
9	Waterproofing/caulking/paving	The establishment of a paved area (inclusive of associated works) of more than 4500 square metres during a two-year period.
11	Establishment of hotels, guesthouses, etc.	The establishment, modification, expansion, or decommissioning or abandonment (inclusive of associated works) of a hotel, inn, etc., with a capacity of 30 rooms or more.
12	Land reclamation	The reclamation of land (inclusive of associated works).
13	Coastal or offshore construction or modification and dredging activities	(a) The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of marinas, piers, slipways, jetties or other coastal features; (b) The establishment, modification, or expansion (inclusive of associated works) of artificial reefs or other offshore structures; (c) The dredging or cutting of coastal or marine areas.

ACTIVITY		DEFINITION
18	Establishment of a facility for materials used in construction	(a) The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a plant for the manufacture of raw materials or products used in construction;
29	Establishment of infrastructure for the storage of petroleum or liquid petroleum gas or their derivatives	The installation, expansion, decommissioning or abandonment (inclusive of associated works) of a storage facility with a gross capacity of more than 500 barrels.
31	Establishment of parks, nature trails and other recreational areas	(a) The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a park, nature trail, board walk or other recreational facility supporting a potential visitor use of 500 or more individuals per day;
34	Establishment of infrastructure for marine transportation	The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a marine terminal, harbour/port or facilities for dry-docking or ship repair or construction.
35	Establishment of a facility for solid waste disposal	The establishment, modification, expansion, decommissioning or abandonment of a solid waste disposal facility inclusive of the disposal of industrial waste, aircraft and ship generated waste.
40	Establishment of water distribution systems	(a) The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of pipeline distribution systems for the delivery of potable, process water or sewage;

ACTIVITY		DEFINITION
		(b) The laying of water and sewage mains (inclusive of associated works) along an existing or a new right of way for distances of more than 1 kilometre during a two-year period.
41	Establishment of land drainage and irrigation	(a) The establishment, modification, or expansion (inclusive of associated works) of a land drainage or irrigation scheme for a parcel of land or more than 1 hectare during a two-year period.
42	Establishment of waste water or sewage treatment facilities	The establishment, modification, expansion, decommissioning or abandonment (inclusive of associated works) of a waste water or sewage treatment facility.
43	Provision of other service-oriented activities	(c) The establishment, modification, decommissioning or abandonment (inclusive of associated works) of a commercial kitchen with a water consumption of 9 cubic metres or more per day;

The CEC Rules describe the process to apply for and obtain a CEC. Rule 5(1) describes the process for preparation of the TOR for an EIA, while Rule 10 outlines the standards for preparation of the EIA.

In order to be environmentally acceptable, the proposed project must be in compliance with international standards or guidelines (as indicated in the National Environmental Policy, 2018) and pertinent local standards or guidelines. Local environmental standards or guidelines, which should be considered, are listed in **Annex 2**, together with sources for international standards.

EIA OBJECTIVES

The purpose of the EIA is to identify and assess (qualitatively and quantitatively) the type and extent of environmental (physical and biological) and socio-cultural impacts arising from the proposed project. The EIA must evaluate all potentially significant primary, secondary and cumulative impacts for each project alternative presented. The EIA Report must address these requirements as well as describe strategies for:

- The management or mitigation of any significant negative impacts;
- Assessment of the risks and hazards associated with all aspects of the proposed project; and
- Monitoring of the mitigation measures used, to ensure that the desired results are being achieved.

The Applicant must ensure that details provided regarding the design, layout and operations of all activities are sufficient for cumulative impacts to be assessed and for a rigorous assessment of these impacts in the public domain. The assessment must also address potential future project modifications, where these can reasonably be predicted.

These must all be addressed in the EIA Report to the satisfaction of the EMA.

It is envisaged that the EIA Report will be based on the results of available research, studies and data, as appropriate, with further studies being conducted where necessary and practical. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed in the EIA Report.

The EIA is intended to:

- Allow relevant agencies, non-governmental organisations and other members of the public that can potentially be affected by the proposed project to understand the project and its impacts on them and their socio-cultural, biological and physical environment, and to have their views and concerns addressed in the determination of the CEC application;
- Provide decision-making information with respect to the determination of the CEC application;
- Provide information that allows for maximum benefits of the project to the Applicant, the environment, as well as the relevant agencies, non-governmental organisations and other members of the public, if a CEC is granted and the project proceeds; and
- Allow regulators to ensure that positive impacts of the project are maximised and negative impacts eliminated or minimised to acceptable levels.

REQUIREMENTS FOR ENVIRONMENTAL IMPACT ASSESSMENT AND THE EIA REPORT

Specific and detailed requirements for the EIA are set out in **Annex 3** and these must be addressed fully in the EIA Report. In general terms, items to be addressed in this EIA include:

1. **Legislative and Regulatory Considerations;**
2. **Institutional and Financial Mechanisms;**
3. **Description of the Project** [including the location of temporary construction facilities and infrastructure, area(s) identified for preservation of wetlands or other ecosystems and waterways, alteration or redirecting of waterbodies, establishment of sediment and erosion control structures, establishment of stormwater control mechanisms, marina and related marina facilities, boat repair facilities, hotel and water park, associated buildings, boardwalk and other recreational/entertainment areas, wastewater treatment facilities, establishment of access roads, installation of utilities and other construction activities.];
4. **Definition of the Study Area** in detail (which will include the proposed site, i.e. immediate study area, together with the wider area within which the proposed project activities and operations may have impacts on the physical, biological and socio-cultural environments);
5. **Description of the environmental and socio-cultural characteristics of the Study Area** (ensuring that the physical, biological, and socio-cultural features that may be susceptible to the impacts of the proposed project are clearly identified and described);
6. **Analysis of Alternatives** (describe the alternatives to project designs and location that have been considered and justify the final selections);
7. **Stakeholder Engagement** (which entails a listing of all relevant agencies, non-governmental organisations, specialised/focus groups, individuals and other members of the public engaged in the course of selection of the most appropriate project designs, together with the comments and feedback provided);
8. **Analysis of Environmental and Climate Change Impacts** (describe the impacts that the proposed development will have on the physical, biological and socio-cultural environments and consideration of climate change impacts on the proposed development);
9. **Assessment of Risk** (describe the risk associated with the proposed development as it relates to the physical, biological and socio-cultural environments);
10. **Emergency Response Plan;**
11. **Mitigation Strategy and Environmental Management Plan** (describe and detail the measures to be taken to mitigate adverse impacts of the proposed project);
12. **Monitoring and Intervention Strategy** (describe and detail the ways in which the impacts of the proposed project are to be monitored and measured and contingency plans and actions to be activated if unforeseen and harmful – or potentially harmful residual impacts arise during the course of all phases of the development).

Detailed requirements relating to the format and presentation of the EIA Report are set out in **Annex 3A**.

Detailed requirements relating to Mapping and Geographical Information Systems are set out in **Annex 3B**.

OTHER INFORMATION

Under section 35(5) of the EM Act, any application that requires the preparation of an EIA shall be submitted for public comment in accordance with section 28. Section 28(3) stipulates a period of not less than 30 days to receive public comments and this EIA Report would be made available for such comments as part of an administrative record.

SUBMISSION REQUIREMENTS

In order to aid the review process, the following is required:

- Two (2) hard copies and two (2) digital copies of the EIA Report must be submitted to the EMA in the first instance for preliminary review. If the EMA is not satisfied with the original submission, the documents will be returned to the Applicant to address these concerns;
- If the submission is deemed acceptable, the Applicant will be requested to submit to the EMA a further thirteen (13) hard copies and six (6) digital copies of the EIA Report;
- Digital copies of the EIA Report must be in PDF format and the Executive Summary in Microsoft Word. Each chapter of the EIA Report and each Appendix must be individual PDF files;
- All spatial and mapped data required must be provided digitally in a GIS format compatible with ArcGIS 10.3.

All submitted information will be used for the public comment process and will be made available to other departments/agencies that would have a critical role in the evaluation of the EIA Report. Any information submitted may be copied as required, except in cases where confidentiality has been approved.

Dated this 14th day of April, 2022



**Environmental Management Authority
MANAGING DIRECTOR**

ANNEX 1

OUTLINE OF THE EMA'S UNDERSTANDING OF THE PROPOSED PROJECT

The Applicant has applied for a CEC for the establishment of a marina and related marina facilities at Friendship Estate, Canaan, Tobago.

The proposed project will entail the following:

- Reclamation of 10.4 hectares (ha) to accommodate berthing facilities that consist of finger piers, jetties and a gangway for access to the land. The reclamation will occur in water depths of less than 1.0 m to facilitate the following installations:
 - The finger piers will berth boats that are 12 m, 15 m and longer boats with a width of 1.7 m wide. Berthing will be able to accommodate 1, 50 m Coast Guard Vessel. Berthing will accommodate 153 yachts and 7 mega yachts. There will also be marina space for an additional 90 or more slops on the eastern boundary of the marina space;
 - The area will also contain 4 jetties, each approximately 156 m x 5 m with gangways of 10 m x 2.5 m;
 - Construction of a weir for an enclosed salt water pool;
 - Construction of 2 breakwaters that will consist of a 2 -layer armour rock toe, 'X-Bloc' armour layer, rock underlayer, core fill layer and 'X-Bloc' roundhead ends. These 2 breakwaters will be 563 m and 305 m in length, respectively;
 - Raising the swampy area by 2.0 m on the western end of the property.
- Dredging for the access channel and turning basin will occur in mostly coral rock at maximum depths of 5.7 m and 4.0 m, resulting in approximately 320,000 cubic meters (m^3) and 180,000 m^3 of dredged material which is to be reused as fill;
- A 50 to 100 room Capitainaire hotel, inclusive of restaurants, bars, lounging areas and meeting places, a chandlery and other concessionaires;
- An administration building to house Immigration and Customs services;
- Coast Guard Support Building;
- Residential resort comprising 33, 2-bedroom villas, 36, 2-bedroom condominiums and 3, 1-bedroom suites;
- Marquee restaurant with fast foods and outdoor eating area, with a saltwater pool (and proposed coral garden);
- A water park and associated facilities;
- Installation of a wastewater treatment plant; potable water, electrical and telecommunication networks/systems for the development;
- The dry docking and/or ship repair services will include the following:
 - Storage of 290 boats with space for an additional 60-70 boats on the western end of the boat storage area;



- Transportation of boats via a 100-150 ton capacity Straddle carrier;
- Two (2) repair workshops;
- Administrative building and car park.

The total area for the proposed development is 15 ha of which 10.4 ha will be reclaimed coastal area for the marina, boat repair/dry docking facility and 50-100 room hotel. The Applicant also proposes to develop a private beach within the saltwater lagoon and the creation of the coral garden.

A handwritten signature in black ink, appearing to read "J. T." or a similar initials.

ANNEX 2

APPLICABLE STANDARDS AND GUIDELINES

In order to be environmentally acceptable, the proposed project must be in compliance with international standards or guidelines [as indicated in the National Environmental Policy (NEP), 2018] and pertinent local standards or guidelines. Local environmental standards or guidelines, which should be considered, are listed below.

1. Air Pollution Rules, 2014 (APR);
2. Water Pollution Rules 2019 (WPR);
3. Environmentally Sensitive Species (ESS) Rules 2001;
4. Environmentally Sensitive Areas (ESA) Rules 2001;
5. Noise Pollution Control Rules 2001 (as amended) (NPCR);
6. National Environmental Policy, 2018;
7. Waste Management Rules, 2021;
8. National Climate Change Policy, 2011
9. Draft Integrated Coastal Zone Management Policy Framework, 2020;
10. Town and Country Planning Act, Chapter 35:01;
11. Planning and Facilitation of Development Act, 2019;
12. The National Physical Development Plan, 1986;
13. The National Spatial Development Strategy, 2013;
14. Pesticides and Toxic Chemicals Act, Chapter 30:03;
15. Disaster Measures Act, Chapter 16:50 (Rev. 2011);
16. The Water and Sewerage Act, Chapter 54:40;
17. The Waterworks and Water Conservation Act, Chapter 54:41 (Rev. 2011);
18. National Wetlands Policy;
19. State Lands Act, Chapter 57:01;
20. The Harbours Act, Chapter 50:06;
21. Shipping Act, Chapter 50:10;
22. The Shipping (Marine Pollution) Bill;
23. The Yachting Policy of Trinidad and Tobago, 2017 to 2021;
24. The Petroleum Act, Chapter 62:01 (Rev 2011) and all relevant subsidiary legislation thereunder;
25. National Oil Spill Contingency Plan, 2013;
26. Oil Pollution of Territorial Water Act Ch. 37:03 (Rev 2011);
27. Guidelines for Handling and Storage of Petroleum Products and Combustible Liquids, 1994;
28. Procedures for the approval of chemicals in the petroleum and petrochemical industry;
29. Occupational Safety and Health Act, (as amended), Chapter 88:08;



30. Marine Area (Preservation and Enhancement) Act, Chapter 37:02;
31. Protection of Turtle and Turtle Eggs (Amendment) Regulations, 2011;
32. Fisheries Act, Chapter 67:51;
33. Conservation of Wildlife Act, Chapter 67:01;
34. National Protected Areas Policy (Rev. 2011);
35. National Biodiversity Strategy and Action Plan for Trinidad and Tobago, 2017 to 2022 (Revised); and
36. Trinidad and Tobago Bureau of Standards (TTBS), Requirements for Tourist Accommodation - Part 1: Hotels and Guesthouses (2nd Revision) Trinidad and Tobago Bureau of Standards (TTS 22-1:2012).

- The design, construction and operation of the marina facility shall comply with good international industry practice (GIIP) by incorporating impact avoidance and management measures into the design, construction and operation of the Project. The EIA shall identify and specify relevant GIIP to avoid and manage environmental and social risks and impacts associated with marina design, construction and operation. GIIP that requires consideration is provided by the following organisations:

- International Maritime Organization (IMO) – regime for shipping;
- International Association of Ports and Harbours (IAPH);
- International Chamber of Shipping (ICS);
- World Association for Waterborne Transport Infrastructure (PIANC);
- World Organisation of Dredging Associations (WODA);
- United Nations Environment Programme (UNEP);
- American Association of Port Authorities (AAPA) – Environmental Management Handbook; and
- European Seaports Organization (ESPO) – Green Guide.

Other international standards or guidelines can also be sourced from the following:

- International Conventions to which Trinidad and Tobago is signatory e.g. United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal; the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Annexes I – VI; the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2017, International Convention for the Safety of Life at Seas (SOLAS) 1974, as amended; the International Convention for the Control of Harmful Antifouling Systems on Ships; and any other relevant agreements and treaties, and the following:



- United States Environmental Protection Agency (USEPA);
- World Bank Group, including the International Finance Corporation (IFC);
- The Intergovernmental Panel on Climate Change (IPCC);
- World Health Organization (WHO);
- Environmental Health Services (EHS);
- Multilateral Environmental Agreements; or
- Other appropriately referenced and available material.

ANNEX 3

DETAILED REQUIREMENTS FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

1.0 Legislative and Regulatory Considerations

- a) Describe the relevant local and international regulations, standards and guidelines governing environmental quality, health and safety that would apply to the proposed project. Some of these are identified in **Annex 2** and should be expanded, as appropriate.
- b) Other agencies will be involved in various approval processes that would be applicable to this project. The approvals that are required should be outlined. Some of these agencies include, but are not limited to:
 - i. The Tobago House of Assembly (THA);
 - ii. The Town and Country Planning Division of the Ministry of Planning and Development (TCPD);
 - iii. The Department of Natural Resources and Forestry of the Division of Food Security, Natural Resources, the Environment and Sustainable Development, THA;
 - iv. The Division of Tourism, Culture, Antiquities and Transportation, THA;
 - v. The Division of Infrastructure, Quarries and Urban Development, THA;
 - vi. The Division of Health, Wellness and Social Protection, THA;
 - vii. The Tobago Emergency Management Agency (TEMA);
 - viii. The Ministry of Energy and Energy Industries (MEEI);
 - ix. The Commissioner of State Lands of the Land Management Division, Ministry of the Agriculture, Land and Fisheries (CoSL);
 - x. The Occupational Safety and Health Authority and Agency of the Office of the Chief Secretary, THA (OSHA);
 - xi. The Maritime Services Division of the Ministry of Works and Transport;
 - xii. The Water and Sewerage Authority of Ministry of Public Utilities (WASA);

- xiii. The Water Resources Agency of the Ministry of Public Utilities (WRA);
- xiv. Trinidad and Tobago Electricity Commission (T&TEC);
- xv. The Archaeological Committee via the Archaeological Centre of the University of the West Indies;
- xvi. The Land Reclamation Committee of Ministry of the Agriculture, Land and Fisheries (LRC);
- xvii. The Hydrographic Unit, Surveys and Mapping Division of the Ministry of Agriculture, Land and Fisheries (Hydrographic Unit);
- xviii. Institute of Marine Affairs (IMA);
- xix. The Trinidad and Tobago Fire Service of the Ministry of National Security (Fire Service);
- xx. The Trinidad and Tobago Police Service of the Ministry of National Security (Police Service);
- xxi. The Trinidad and Tobago Coast Guard of the Ministry of National Security (Coast Guard).

2.0 Institutional and Financial Mechanisms

- a) Examine institutional and financial mechanisms or arrangements which may be utilised to address the following:
 - i. Impacts resulting from emissions, discharges, spills, leaks or other emergencies, accidents and incidents;
 - ii. Unexpected health and environmental consequences arising out of upset conditions, accidents or incidents;
 - iii. Restoration/rehabilitation of cleared areas, laydown yards, etc. after construction has been completed;
 - iv. Maintenance activities during the lifetime of the project.
- b) Mechanisms for addressing the implementation of mitigation measures and compliance monitoring by regulatory agencies must also be identified and evaluated.

3.0 Description of the Project

- 3.1 The purpose and need of the project, should be clearly described, and include:



- A justification for its conceptualisation and implementation;
 - A discussion of all possible alternatives that were considered;
 - Justification for the selection of the preferred alternatives; and
 - A detailed description of all project phases and activities.
- 3.2 A site plan of the entire site at a scale of 1:10 000 or 1:5000 (or other appropriate level) shall be provided to illustrate the general layout of the proposed facilities as well as their relationship with the study area. Appropriate plans shall be included, at relevant scales, to facilitate comprehension of location, design, construction or operational processes, where necessary;
- 3.3 Provide sufficient information on the project scope and detail in the project description to allow quantitative assessment of the environmental consequences where practical. If the scope of information varies among components, processes or phases of the project, provide a rationale, demonstrating that the information is sufficient for assessment purposes;
- 3.4 Detailed information on the project should be provided and must include the following:
- a) Location — map(s), showing the overall positioning of the proposed marina and marina related facilities, boat storage/repair workshops, hotel, water park areas, and the associated infrastructure/utilities in relation to (i) one another, (ii) the surrounding facilities and (iii) the surrounding area. This should show proposed locations for clearing and filling (i.e. onshore areas), dredging, reclamation, piling works, area earmarked for the establishment of coastal structures, points of connection to the land, including their relationship to other proposed and existing activities in the area (e.g. existing marine traffic lanes, fishing activities, residential, commercial, recreational, cultural and other tourism-related activities within the area). Geographical co-ordinates must be provided for all project boundaries, structures and project components;



Also, the map must illustrate the project location showing points, shapes and boundaries with respect to existing roads, bridges, watercourses, residential communities, coastlines, fish landing sites, fishing and spawning areas, wetland areas, outfalls, recreational beaches and other tourism related facilities, turtle nesting sites, seagrass beds, reef and lagoon systems, as well as other terrestrial, coastal and sub-sea features (whether natural or man-made) that can be affected by changes to the bathymetry, morphology and coastal processes of the area; proposed area(s) for the disposal of surplus dredge spoil that will not be used in land reclamation activities, marine migratory pathway(s), rock outcrops, areas of cultural significance, designated protected areas and areas that should be conserved, existing and proposed marine transportation routes, including any alternative routes, etc.;

- b) Criteria used for the location of the proposed overall project, associated infrastructure, and associated constraints including identification of natural hazard and climate change elements that may affect the development of the project;
- c) Description of any climate change considerations incorporated into the project's design, such as, but not limited to:
 - Project location/siting and layout;
 - Potential Greenhouse Gas (GHG) emission sources associated with the project;
 - Proposed technologies and/or strategies to reduce identified GHGs.
- d) Project scope – Description of all phases of the project including, but not limited to:

Site Preparation and Construction

- A description of mobilisation and site preparation activities, such as, but not limited to clearing, grading and filling of land, establishment of temporary access roads, site offices/employee facilities and material storage facilities/areas;



- Dredging: Description of the methods and requirements for all dredging works. Flow/process diagrams shall be utilised as far as possible to illustrate the dredging process, where applicable. This description should include the following:
 - Illustrations with scaled pre- and post-dredge surveys with particular emphasis on the extent/depth of dredging, in metres. This applies to coastal/onshore modification, as well as to marine/bathymetric alterations from baseline conditions;
 - Detailed information on the dredging equipment requirements. This should be based on the physical and chemical characteristics of the dredge material, proposed disposal site(s), and the physical conditions of the dredge site (to be determined through an underwater survey prior to the commencement of dredging activities to determine whether any debris is present on the sea floor, that may create an environmental incident or pose an environmental hazard). Additionally, a description of the technique or method that will be used in the dredging process must be provided;
 - Indicate the volume of dredged material that will be generated, the anticipated rate of generation of the dredged material, and intended use or fate of dredge spoil;
 - The depth to which dredging will be conducted, in metres;
 - An estimate of the number of vessels to be utilised in the dredging process, days and times of dredging activities and estimated duration of the dredging period.
 - The proposed method(s) and location(s) for dewatering, treatment (if applicable) and disposal of dredged spoil.



- Reclamation
 - Description of the methods that would be used for reclamation activities. This description shall include methods for dewatering/slurry removal from the reclaimed area during the reclamation phase and conceptual or preliminary designs (i.e. scaled plans, cross-sections and elevations) of the reclamation area (acreage for overall facility);
 - Details of the suitability of the materials that will be used for the reclamation, with attention being given to the quantities, nature and quality and source of materials for filling and reclamation as well as transport methods, staging and routes;
 - Indicate the sediment budget and the manner in which the shortfall in material would be accounted; indicate the source(s) of additional fill material, if applicable;
 - Description of the measures that will be implemented for the protection of any existing submarine structures, in the vicinity of the project that could be impacted by the dredging and reclamation works, where applicable.
- Piling Works and Establishment of Coastal Structures

Conceptual or preliminary designs (i.e. scaled plans, cross-sections and elevations) shall be provided for all proposed coastal structures_i.e. breakwater(s), revetments, berths, jetties, finger piers, slip way(s), wave barriers, coral garden/artificial reef, where applicable;

 - Details of the source and quantity of the material to be used and a description of the type of material to be used for the construction of these coastal structures;
 - Details of the proposed coastal structures shall also be included in relation to the Highest Astronomical Tide (HAT), Mean High Water Mark (MHWM), Mean Low Water Mark (MLWM), as well as long-term climate related changes (i.e. Climatic High Water marks based on modelling scenarios that reflects the likely climate change and sea level rise);



- Design considerations for the protection of the facilities from the effects of high winds, seismic activities, ocean swells, extreme events, as well as impacts relating to climate change, such as but not limited to, sea level rise, inundation, frequency of coastal flooding and storm surges. This shall take into account the existing climate conditions and the reasonably foreseeable future climate conditions, as it relates to planning, design and construction of the facility, selection of materials to be used and the operating plans for the project;
- Details of the maintenance plans for the proposed coastal structures during the post-construction/operational phase of the development.
- Establishment of access road and causeways
Description of the requirements for earthworks and site preparation, including the nature and extent of cutting, filling and grading works, where applicable, to be done at the site to facilitate access road(s) and the causeways. This description should include the following:
 - Scaled illustrations of pre- and post-development plans and section diagrams, showing the nature and extent of cutting, filling and grading works, where applicable;
 - Description of the methods and equipment proposed for the site works;
- Establishment of structures/buildings for the overall development
 - Description of the construction procedure/methodology, for all project infrastructure, source and estimated quantity of aggregate, fill and other materials to be utilised, equipment, machinery and vehicles to be used during the construction phase, as well as measures for containment or disposal of any construction spoil;
 - Identification of areas/routes for the installation of pipelines for the transmission of water, fuel and any other utilities required for overall development, as well as a description of the procedures/construction methods and equipment proposed for use;



- Description of construction of other facilities such as the marina, vessel repair facilities, residential and commercial buildings, water park, saltwater lake, fuel bunkering and wastewater treatment facilities, administration, maintenance and waste storage areas, where applicable.
- Drainage and Stormwater Management
 - A description of proposed temporary and permanent drainage plans/mechanisms, including green infrastructure, during the construction and post-construction phases. Drainage infrastructure (natural and built) as well as tidal levels/effects shall also be discussed in relation to the proposed infrastructure in the prevention and alleviation of flooding (where applicable);
 - The description must demonstrate that the proposed stormwater management measures can effectively manage the release of stormwater from the site and surrounding coastal areas, while limiting the potential for stagnation, reduced circulation and debris accumulation; include rainfall data in the area indicating peak flow run off, intensity, pre-development discharge, etc.;
 - Scaled site plans showing the proposed site drainage, measures for the management of stormwater (temporary and permanent), as well as any contaminated stormwater from concessionaire stands, restaurant, marina, resort and vessel repair areas. This shall be illustrated in relation to existing (built and natural) drainage infrastructure;
 - Scaled site plans showing the proposed site drainage, measures for the management of stormwater, sediment and erosion from the reclaimed area, as well as any material storage and lay-down yard during the construction phase;
 - Expected discharge rates and all proposed point(s) of discharge into the receiving environment such as, but not limited to, receiving onshore drainage systems, if applicable, and the nearshore coastal and offshore environments;

- A Flood Risk Assessment to demonstrate that the site is not at an unacceptable risk from flooding and that the proposal will not give rise to an increased flood risk elsewhere. The assessment must identify the potential flood depths across the site for a 1:100 year storm event and demonstrate how allowances for climate change impacts were considered.

Operation and Maintenance

- Provide a description of utilities (e.g. water, natural gas, electricity and telecommunications) in terms of requirements, availability, sources and plans for obtaining such, and infrastructure that will be required (e.g. storage and treatment facilities). A description of any renewable energy utilities/green energy that will be included within the project should also be provided;
- Indicate the projected water needs (in cubic metres per day) for the entire development, such as but not limited to, drinking water supplies and other 'domestic' needs, recreational pools, commercial uses (e.g. restaurant) and other uses;
- Provide a description of the types of chemicals, such as pesticides and fertilisers, and quantities that may be typically used for landscaping of the grounds; include Safety Data Sheets (SDS) for the proposed chemicals in an appendix;
- Description of the maintenance dredge requirements for the proposed approach channel and turning basin. This should include the anticipated siltation rate, frequency with which dredging may be required and proposed areas for disposal of the dredged material;



- Detailed description of the operations of the overall proposed development. This should include a description of the range of facilities proposed and services that will be provided, including the respective capacities of the facilities (i.e. patrons and staff, occupants/residents); anticipated maximum number and type(s) of vessels (including length and draught, in m), as well as operations such as, but not limited to, boat cleaning and repairs; concessionaire booths, resort, marina, the wastewater treatment plant, fuel and chemical storage/bunkering facilities and fuel depot with details of containment, where applicable;
- A description of all the activities that would take place during each phase, including the equipment and machinery involved. Flow diagrams shall be utilised as far as possible to illustrate the processes for the different phases, where applicable.
- Description of the source, estimated quantity and composition of all potentially hazardous (e.g. dredge spoil, anti-fouling paint, scale and rust) and non-hazardous (e.g. international and domestic solid waste) solid and semi-solid wastes (e.g. sludge), that will be generated, a description of the marina reception facilities and how this waste will be managed (i.e. containment, treatment, transport and disposal) and what special risks, if any, they pose. All estimates of quantity must be stated in appropriate units of volume or weight;
- Description of the source, estimated quantity and composition of all potentially hazardous and non-hazardous liquid wastes (e.g. sewage, waste chemicals, waste oils, oily water, bilge waste) that will be generated, and a description of the marina reception facilities and how this waste will be managed (i.e. containment, treatment and disposal) and what special risks, if any, they pose. All estimates of quantities must be stated in appropriate units of volume or weight. The treatment and collection of all effluent generated may best be depicted on flow diagram(s);



- **Wastewater Treatment Plant (WWTP)**

Provide a detailed description of the type of system proposed for the treatment of all wastewater generated from the development. This shall include, but not be limited to:

- Detail the types of wastewater that will be treated by the system(s) and characterise all parameters of concern from the identified waste streams;
- The type of WWTP to be utilised to treat all identified waste/parameters of concern;
- Provide the design capacity of the proposed treatment system(s), in m³ per day (m³/day), and demonstrate that it is adequately sized for the estimated volume of wastewater that would be produced;
- Provide a process flow diagram which clearly illustrates each component of the selected system(s). This should be accompanied by a description of how each component of the system functions;
- Provide details of any seeding/stabilisation period, where applicable. Details of seeding/stabilisation should include the type of material to be used for seeding, the anticipated maximum quantity of seeding material, the length of the process, and mitigation measures to ensure that the effluent quality being discharged during the seeding period does not exceed the values stipulated in Schedule II of the Water Pollution Rules 2019 (WPR);
- The method of disinfection, such as ultraviolet (UV) radiation, ozonation or chlorination, to be employed in the proposed treatment process. Should chlorination be the selected method of disinfection, please indicate the form of chlorine that will be used, such as chlorine gas or sodium hypochlorite. In addition, please indicate whether chlorine will be stored on the site and the anticipated maximum quantity of chlorine to be stored on the site, if applicable;



- Location of final disposal for treated wastewater and associated sludge. The number of discharge points and applicable parameters must be included;
- Provide a description of the associated infrastructure required to support the operation of the proposed WWTP (e.g. collection/sewerage system).
- Inspection and maintenance regime for the treatment system to ensure its proper operation for its lifetime.
- Description of the source, estimated quantity and composition of all potentially hazardous and non-hazardous (e.g. domestic solid waste) solid wastes that will be generated, as well as a description of how they will be managed (i.e. containment, treatment, transport and disposal) and what special risks, if any, they pose. All estimates of quantity must be stated in appropriate units of volume or weight. Special attention must be paid to the generation of waste from the boat repair activities and mechanisms for managing such wastes;
- Description of the source, and estimation of the quantity and concentration-based rates of air emissions generated from all project-related activities from this type of project in units of milligrams per normal cubic metres (mg/Nm^3);
- Description of the anticipated source(s) of noise and estimation of the sound pressure levels (i.e. peak and average levels) expected to be generated from any project related activities from this type of project (in dBA);
- Description of the anticipated sources of light from the proposed project;
- Description of land tenure for areas directly affected by the proposed development at the present time and the intended tenure when the development is commissioned, including management arrangements and responsibilities;
- Identification of structures and other physical assets that will be subject to displacement due to project-related works, if applicable.



- 3.5 **Scheduling of the project** - Provide specific timeframes and sequencing for all stages of the proposed development including mobilisation, staging of equipment and materials, site preparation, dredging, reclamation, construction (distinguish between the different phases of construction, i.e. coastal nearshore, offshore and onshore works), installation of infrastructure, utilities and facilities and rehabilitation of the project area, post-construction, operational and maintenance activities; indicate which activities will occur concurrently or sequentially. Project schedules should utilise flowcharts/Gantt charts as much as possible;
- 3.6 Identification of staffing, support facilities and services that would be required during the different phases of activities;
- 3.7 Description of required utilities (natural gas, water, fuel, electricity, etc.) in terms of requirements and areas to be utilised, availability, sources and plans for obtaining such, and infrastructure that will be required. Evidence of discussions with relevant utility companies should be provided to demonstrate their ability to meet the requirements of the development. A description of any renewable energy utilities that will be included within the project should also be provided;
- 3.8 Description of transportation requirements – discuss equipment and machinery to be utilised, access routes and information regarding the design and upgrade of new or existing transportation resources;
- 3.9 Description of other existing, approved, ancillary and future projects in sufficient detail to allow for assessment of cumulative impacts, particularly over the duration of the proposed activity;
- 3.10 Inspection and maintenance – describe integrity checks and procedures for maintenance of equipment and infrastructure, including upgrade work. This shall include, but not be limited to, boat collisions, spills and any required emergency or shutdown procedures;

4.0 Definition of the Study Area

- 4.1 The study area should be determined by the extent of direct and indirect interactions between the proposed project and the physical, biological and socio-cultural environments including the natural hazard or climate change elements affecting the spatial and/or temporal boundaries of the proposed project;



It should include the proposed site, i.e. onshore, coastal zone and nearshore marine environments and all relevant water bodies such as but not limited to, lower and upper watersheds, any nearby coastal features such as reefs, that will be directly affected by the proposed project and by its associated infrastructure (during the pre-construction, construction and operation phases of the project).

The location of surrounding vegetation, roads, reefs and beaches that may be affected, shall also be included.

In addition, the study area must include the locations for reclamation, dredging and dredge spoil disposal site(s), associated marine vessel routes and all construction sites.

4.2 The study area should also include:

- a) Surrounding environment that can be affected by light/illumination, noise and vibrations, air emissions and dust, increased marine and vehicular traffic, spills, sediment plumes; changes to the water quality, bathymetry, morphology and coastal processes of the area; emergencies or other upset conditions, as well as other existing infrastructure;
- b) Areas that may be potentially affected by the activities or by associated infrastructure, such as off-site facilities and other existing infrastructure;
- c) Surrounding communities that can be affected by noise, air emissions, increased traffic, spills, emergencies or other upset conditions also need to be considered in defining the study area;
- d) Biological environments inclusive of the terrestrial, coastal nearshore and marine ecosystems, such as but not limited to mangroves, wetlands in the coastal areas, reef systems, seagrass beds, marine and terrestrial protected areas and Environmentally Sensitive Species, that can be affected by the project's activities;
- e) Adjacent developments (existing and proposed that are planned within the range of influence of the project site), as well as commercial/recreational activities that may be affected by the proposed project (e.g. agriculture, fisheries, hotels and tourism-related facilities).



- 4.3 The immediate and wider study area shall be properly delineated and referenced in relation to the Universal Transverse Mercator (UTM) coordinate system (Zone 20 N) within the World Geodetic System 84 (WGS84) datum and should be described with accompanying photographs, aerial photographs, satellite imagery, geological maps and/or topographical maps, land-use maps, hydrographical maps and any other diagrams at easily understood scales to illustrate the spatial extent of the project, as well as potentially impacted areas and sensitive receptors. Labelling of maps and diagrams must be at a font size that is legible, and data sources and dates must be cited;
- 4.4 The rationale used for delineation of the study area (i.e. immediate and wider) must be explicitly described.

5.0 Description of the environmental and socio-cultural characteristics of the study area

- 5.1 Conduct a review of recent studies [i.e. studies conducted within the last five (5) years] undertaken in the study area to determine the relevance of these studies as they relate to the current physical, biological and socio-cultural environments. Where recent studies are being utilised, justification must be provided to demonstrate that the baseline conditions would not have changed over this five-year period and the data are still representative of the study area. Where it is believed that past studies failed to produce a relatively good assessment of baseline conditions, the Applicant shall undertake field studies to fill appropriate data gaps so that a comprehensive description of the physical, biological and socio-cultural environments can be produced;
- 5.2 The data presented shall be representative of the study area. The term 'representative' defines the extent to which a set of measurements taken at a collection site spatially and temporally reflects the actual conditions within the study area. Therefore, in instances where the data are being collected and reported from stations that are located offsite (i.e. outside the boundaries of the study area), and/or, where data is dated (i.e. greater than five years), a justification must be provided to demonstrate that the data are representative of the study area. Otherwise, the Applicant will be required to provide more accurate, site-specific data;
- 5.3 Include changes that may occur before the project commences in light of previous, ongoing (i.e. other operations within the defined study area) or future activities that could reasonably be determined to have a combined effect;



- 5.4 Sufficient detail is needed to allow a clear understanding of the likely negative impacts of the overall project, and to assess the effectiveness of any proposed mitigation measures. An examination of any positive impacts should also be included to ensure as comprehensive an assessment as possible;
- 5.5 Adequate spatial and temporal samples shall be taken to ensure a proper assessment of baseline conditions. Details of the study area shall include the following:

5.5.1 Physical Environment

The Applicant shall design a network of sampling stations for the study area which is representative of areas that may be impacted by the release of pollutants into the environment or by the other aspects of the project. The sampling network and regime must be designed to obtain a comprehensive assessment of the environmental conditions, including seasonal variations within the study area. Methodologies should be detailed for all sampling stations, sampling regions and analyses, and included in the relevant appendices of the EIA document. An assessment of the physical environment should include:

5.5.1.1 Geology, Soils and Sea Floor Sediments

- a) Land use capability maps which clearly represent the potential uses of the land within the wider study area;
- b) Regional geology, topography, bathymetry, subsurface stratigraphy (mapped), seabed and sediment characteristics of the study area, especially as they relate to the seismic history and stratigraphy of the area. This should include an assessment of seabed deposits at the site, upon which piling/construction works are proposed, as well as a geotechnical assessment of the onshore soil characteristics and the ability of these areas to support the proposed infrastructure, including geological anomalies of note (if any);
- c) Geomorphology of the study area and specifically for the site wherever practical (i.e. rates of landform change, erosion and depositional processes);
- d) Benthic Sediment Quality Data - an analysis of sediment chemistry and sediment quality of the study area, including particle size distribution, settlement rates and the presence of contaminants such as heavy metals and hydrocarbons shall be assessed by comparison to applicable sediment quality standards and/or historical data for the area. Justification for the standards selected shall be clearly stated.



Attention shall be paid to the bio-available concentrations of the respective parameters. Explanations for any above-standard/average parameter levels shall be proposed;

- e) Dredged Material - (in this case, the areas where the dredge material from the turning basin and access channel will be utilised) - The Applicant shall conduct a baseline assessment of the sediment quality at the proposed dredging sites to determine the quality of the material to be used for the reclamation and beach;

The Applicant shall conduct a scoping exercise to identify the parameters of concern that should be included in the testing regime, based on the characteristics of the material to be re-used, and the characteristics of the receiving environments where dredge and mined material will be re-used.

5.5.1.2 Water

- a) Surface Water Quality – Analysis of freshwater, brackish/estuarine, as well as marine water quality parameters (throughout the water column) according to Schedule III of the Water Pollution Rules 2019. A scoping exercise (based on the intended activities to be carried out during all phases of the project) shall be conducted to identify all relevant baseline parameters that may be affected. Analysis shall include wet season and dry season samples, at least 4-6 months apart and comparison shall be made with any historical data for the area. Explanations for any above-average parameter levels shall be provided. Sampling locations in relation to proposed activities and facilities shall be clearly illustrated on a suitable map.
- b) Surface Hydrology and Drainage - including, but not limited to:
- i. Map and discuss the existing drainage patterns/characteristics of the site and wider study area, [inclusive of the drainage catchment areas, wetland systems and lagoons (where applicable)] contributing to the site) and the dry season and wet season flow rates of all watercourses traversing the study area, where applicable;
 - ii. Identify, describe and map any floodplain areas within the project area, wider study area and any other surrounding areas that may be affected by the project's activities;



- iii. Include details of all flood events within the project area, wider study area and any other surrounding areas that may be affected by the project's activities. The type of impact related to any such flood events should be specified (e.g. property damage, access restriction etc.).

These studies must demonstrate that they satisfactorily describe the full range of environmental conditions that could be expected during the proposed project. Data shall clearly include coordinates of sample points and should be geo-referenced and mapped.

5.5.1.3 Oceanography and Coastal Processes

- a) An assessment of the annual variation of current characteristics, including current velocities and directions (both tidal and residual) of the study area, as they relate to the potential to impact on the project's activities including; discharges and spills, as well as suspension of sediments, and their dispersion;
- b) An assessment of the annual variation of wave characteristics of the study area, as they relate to the potential to impact on the project's activities including annual variation in prevailing wind/wave directions and heights, discharges and spills, as well as suspension of sediments, and their dispersion;
- c) An assessment of the circulation patterns within the study area at different tidal states. This should include; tidal heights and flushing times within the wider and immediate study areas;
- d) An assessment of sediment transport volumes, siltation patterns and directions, and the erosion and accretion patterns within the study area;
- e) Detailed resolution of the most recent bathymetric site survey and the seafloor characteristics (mapped), along with a description of seabed morphology, of the proposed study area including the proposed areas for dredging and reclamation;
- f) Beach profile(s) of the immediate and wider study areas, inclusive of recreational beaches (this should illustrate the manner in which the profile changes through a seasonal cycle);
- g) Water depths, i.e. accurate depth survey of the area at, and adjacent to all the proposed coastal structures and areas proposed for dredging and reclamation;

- h) Historical analysis of the morphological changes along Canoe Bay and adjacent coastal areas to establish any trends;
- i) Natural hazards and/or climatic conditions that may impose constraints on the transport of materials, construction of coastal structures, as well as dredging and reclamation works.

These studies must demonstrate that they satisfactorily describe the full range of environmental conditions that could be expected during the proposed project.

5.5.1.4 Air, Noise, Light and Climate

- a) A description of the climate and meteorology as they relate to the potential to impact on the project's activities, operations, safety and any discharges/emissions related to the activity (including wind speed and direction, prevailing wind conditions, seasonal variations and storm conditions). This shall also include an analysis of the future meteorological conditions of the study area based on published information from recognised sources and appropriate professional judgement. Any extrapolated data must be justified and references provided, where applicable (e.g. source of data and metadata for use in modelling exercises, where actual sampling was not conducted);
- b) Rainfall within the study area, including seasonal variations;
- c) Historical data about the intensity and frequency of adverse weather conditions, such as prolonged periods of heavy rainfall, long period swells, storms and hurricanes that traverse the study area, the potential for such an event, and consequences on the proposed project;
- d) Ambient air quality representative of the study area (onshore and offshore where applicable) that may be affected by project activities - Describe, assess and discuss appropriate ambient air quality parameters associated with the expected emissions of this type of project including, but not limited to the ambient concentration of Total Suspended Particulate (TSP), Particulate Matter of diameters ≤ 10 mm and ≤ 2.5 mm (PM10 and PM2.5), Carbon Monoxide (CO), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Volatile Organic Compounds (VOCs) and Ozone (O₃).

The following shall be considered when conducting the sampling exercise:



- The number and distribution of ambient air quality monitoring stations shall take into consideration the area to be covered and the spatial variability of the pollutants being measured. At a minimum, monitoring shall be conducted upwind and downwind of the property fence line of the nearest sensitive receptor. Meteorological data (wind speed, wind direction, temperature and atmospheric pressure) should be provided;
- A map illustrating the sampling points and a justification for the number and locations of the sampling points must be provided;
- Recommended methods of sampling and analysis include those developed by the United States Environmental Protection Agency (US EPA), the New South Wales Approved Methods for the Sampling and Analysis of Air Pollutants or any other internationally accepted or comparable methods (e.g. ISO and Environment Canada). If the method chosen for analysis does not conform to an internationally accepted or comparable method, please provide a justification for its use;
- Copies of all quality data records in support of the monitoring data should be included. Documents include, but are not limited to, sample records, chain of custody, identification of sampling and analysis equipment, analytical methods, calibration records and the competency of the personnel and/or service provider conducting the analysis (e.g. laboratory certification).

e) Measurement of Sound Pressure Level (Noise)

A baseline noise data collection exercise should be conducted to ascertain ambient noise levels, representative of the study area that may be affected by the project's activities. Sound Pressure Level (SPL) measurements during this exercise shall be recorded for a minimum duration of 24 hours at appropriate locations within the study area, in an attempt to adequately capture the fluctuations in baseline noise levels in the area. This shall include a justification/rationale for selection of sampling locations, to demonstrate appropriateness/representativeness of the selected sites. Monitoring exercises should ideally capture both weekdays and weekends and shall be repeated at each sample location over the data collection exercise. The noise monitoring regime should consider the monitoring of the following parameters for the determination of background noise levels:



- Equivalent continuous sound pressure level (Leq);
- The maximum instantaneous unweighted peak sound pressure level (Lpeak);
- Minimum sound pressure level (Lmin);
- Maximum sound pressure level (Lmax).

The methodology shall be conducted in accordance with the Second Schedule of the Noise Pollution Control (Amendment) Rules, 2022 (NPCR). Reporting shall be done in accordance with the Third Schedule of the NPCR, which includes, but is not limited to: the make and model of instrument, frequency weighting, time weighting, exchange rate and the logging interval.

- f) Light – Qualitatively assess and discuss baseline light conditions (especially for ecological and any residential receptors within or in proximity to the study area); and identify existing sources of artificial light in the study area.

5.5.2 Biological Environment

The Applicant shall use current, available information or site-specific field surveys to assess the terrestrial, coastal and marine environments where applicable, for impact prediction, and development of mitigation and monitoring programmes. The sampling regime must be scientifically rigorous and statistically significant to allow for future comparisons. Life cycles, seasonality and migration of species must also be captured, where applicable.

Characterisation of the biological environment shall include, but not be limited to, the following:

- i. A quantitative description of floral species within the study area (terrestrial, wetland, littoral/riverine and coastal environments, where applicable). This shall include a description of the existing terrestrial and aquatic vegetation, providing information on plant species and communities that are present within the study area, including information on any rare or endangered plant species and information on any specialised or unique plant communities that may be present. Plant communities should be mapped, and the area of any community type that may be lost due to project activities must be estimated, in square metres or ha;



- ii. A quantitative description and classification of faunal species within the study area (terrestrial, wetland, littoral/riverine and coastal/marine environments, where applicable). This shall include, but not be limited to benthic communities, crustaceans, sponges, molluscs other terrestrial/estuarine/marine invertebrates, marine turtles, pelagic and demersal fish species, freshwater/brackish fish species, avian fauna, reptiles, cetacean and terrestrial mammals;

Attention must also be paid to migratory species and endangered/protected species (e.g. marine mammals and marine turtles), highlighting the dependence of the species identified on the estuarine and/or coastal environments. The description shall highlight species of commercial importance within the receiving environment and also focus on seasonality, as well as migration patterns and population estimates. An explanation of, and discussion on, diversity indices and controls used must be provided;
- iii. Identification and description of any environmentally sensitive species and areas and/or sensitive habitats located within the study area. This description shall include the nearshore coastal vegetation (e.g. mangroves and seagrass beds, where applicable) and shall identify areas of spawning grounds/nurseries, fish habitats or feeding grounds, turtle nesting sites, foraging grounds and inter-nesting habitats, staging and high tide roost sites for resident and migratory avian species, species or ecosystems vulnerable to natural hazard or climate change impacts. The location of environmentally sensitive species and areas and/or sensitive habitats should be mapped in relation to the proposed study area;
- iv. Provide information on the ecological relationships, ecosystem services, biological productivity and sensitivity/vulnerability of the floral and faunal species within the study area, using local and international studies. Particular emphasis should be placed on species that may be affected by the project;
- v. Any certain or potential scientific correlation(s) between the health of ecological communities described and the various soil, sediment and water quality parameters observed should be clearly identified and discussed.

Information relating to the biological environment shall be presented in a map or maps, at an ecologically meaningful scale that is administratively practical.

5.5.3 Socio-cultural Environment

The Applicant shall describe the socio-cultural baseline of the study area. In order to capture a true representation of the baseline conditions, it will be useful to identify the proposed project's probable area of influence, as it relates to its potential biophysical and socio-cultural impacts. This may be achieved through the collection, reporting and analysis of appropriate and sufficient data from relevant sources (including Census data, information from village councils, local government, community-based organisations, non-governmental organisations (NGOs) and community knowledge/asset information) and primary research. Field studies should be undertaken to fully establish an appropriate socio-cultural baseline, and to update information that may no longer be current. Appropriate data-gathering methods shall be used commensurate with the level of detail required to determine risk to socio-cultural components. The socio-cultural baseline shall include, but not be limited to, the following information:

- a) Mapped and/or map overlays (depicting any communities within the areas of potential impact) should be used to provide a spatial portrayal of socio-cultural data;
- b) Description of the socio-demographic characteristics of communities within the study area. This description shall include, but not be limited to, the following:
 - i. Present and projected population size in the study area including population growth rates;
 - ii. Socio-economic characteristics of the resident population in the study area(s) (e.g. age, gender, income classes and distribution, highest level of education attained, religion);
 - iii. Major economic activity and employment patterns;
 - iv. Existing skills as indicated by the major existing occupation groups and highest levels of education attained;
 - v. Employment and labour market - indicate opportunities for, or threats to, employment generation and the availability of such employment both locally and within the nearby communities. The availability of employment should be quantified and defined in terms of temporary vs. permanent, skilled vs. unskilled and availability during the different phases of the project;

- vi. In addition, assess the capability of the local population to participate in any employment opportunities afforded by the project.
- c) Marine Traffic Assessment - Evaluation of existing maritime shipping lanes and marine traffic that utilise existing and/or proposed established routes and/or infrastructure within the immediate and wider study areas, e.g. fishing vessels, pleasure crafts and recreational sport craft (i.e. motorised and non-motorised). The assessment must also include assessments of the required capacity for any proposed modification/expansion within the project area, such as but not limited to changes in draughts, berthing space, turning basins and hinterland and accommodations for increased shipping/fishing/recreational activities/vessel traffic;
- d) Land and Resource Use:
 - i. A description of the land use policy for the project area and future development plans for the project area. This shall include identification of the standard land-use categories as well as mapping and description of the spatial distribution of identified land uses;
 - ii. Identification of resource users (including traditional, recreational, religious users and other stakeholder groups ranging from subsistence utilisation of natural resources to resource use on a commercial scale, scientific and research groups, NGOs, CBOs);
 - iii. Description, quantitatively and/or qualitatively, of the use of the area. This shall also include use of access routes, planned and approved future uses, and possible displacements of such uses during all phases of the project as well as socio-economic activities vulnerable to natural hazard or climate change impacts;
 - iv. Identification of all physical infrastructure including but not limited to roads, bridges and transportation facilities and amenities such as potable water and electricity, including the current capacities and the potential to accommodate the increased needs of the proposed development;



- v. Identification of publicly accessible emergency facilities located within or in proximity to the general area of the proposed project (such as, but not limited to, hospitals, health facilities, police and fire services), including the current capacity of these emergency facilities;
- vi. Identification of any archaeological, historical and/or cultural resources (i.e. buildings, structures and/or landmarks) within the study area;
- vii. Identification of scenic views and vistas, if applicable;
- viii. Customs, aspiration and attitudes – indicate (by providing documentation) the acceptability of the proposed project to users of the area, government stakeholders and environmental and other non-governmental organizations (NGO's).

6.0 Analysis of Project Alternatives

- 6.1 The EMA encourages the Applicant to recognise the integral relationship of a robust, iterative alternatives analysis process to meaningful and effective stakeholder engagement and the overall effectiveness of the EIA. A careful, rigorous alternatives analysis carried out at the core of an EIA process presents a logical platform for an effective stakeholder engagement process. These principles are reinforced and supported as sound practice by international bodies such as the World Bank, the Inter-American Development Bank (IDB) and the United Nations, and are consistent with adopted national policies such as the NEP, 2018;
- 6.2 The Applicant shall provide a description of the range of project alternatives or alternate methodologies for achieving the purpose and need for the proposed project. This description must provide a baseline of existing and projected environmental conditions as they relate to the proposed project which must be compared against the potential impacts of all project alternatives;
- 6.3 The ‘no action’ alternative must also be considered. Provide a comparison of impacts as a result of a continuation of existing activities and conditions with those of the proposed project and project alternatives. This will demonstrate potential changes in the existing socio-cultural and environmental baseline conditions without the project;



- 6.4 Project alternatives must be scored against the same criteria as those used in the selection of the preferred option and discussed in sufficient detail to clarify the reasons for preferring certain options, while rejecting others. The reasons for choice of the preferred option(s) should be explained, including the following:
- i. A comparison of the adverse and beneficial effects (both to the environment and community) used as the basis for selection; this must also include consideration of green architecture and infrastructure to aid in minimising the project's carbon and ecological footprint;
 - ii. Compliance with government policy;
 - iii. Compliance with the principles and objectives of sustainable development (i.e. Sustainable Development Goals);
 - iv. The impact of significant delay or abandonment of the project before all of the proposed phases are completed.

The Applicant will benchmark, where applicable, the preferred alternative against alternate designs or case studies of similar projects and will describe reasonable alternatives to the proposed project and operations involved that would achieve similar objectives. This extends to, but is not limited to, the project alternatives such as:

Project Alternatives:

- Siting – possible alternative locations for this development and the various developmental aspects;
- Conceptual design commensurate with best practice related to health protocols, including dimensions, alternative options, for example changes in orientation, layout, components and facilities offered at the proposed marina, alternative reclamation proposals, etc.;
- Spatial arrangement/orientation and design of proposed coastal protection structures;
- Changes in scale/scope of services to be offered at the various facilities within the overall development;
- Types of equipment used in construction activities;

- Types of dredging vessels and equipment used;
- Location of disposal sites for dredge spoil.

Process Alternatives:

- Fill sources for the reclamation area (i.e. marina area), including location and method of aggregate extraction;
- Method of dredging;
- Construction techniques and phasing;
- Operation and maintenance procedures.

7.0 Stakeholder and Public Engagement

- 7.1 Stakeholder engagement is crucial to the overall success of a given project. It can assist in the early identification of all affected stakeholders, identification and mitigation of environmental and socio-cultural issues, maximisation of project benefits, and avoidance or reduction (to the extent practicable) of the potential for controversy, cost overruns and project delays;
- 7.2 The use of alternative means of engagement including but not limited to those below can be considered:
- i. Conducting focus group meetings with identified stakeholders;
 - ii. Lodge/Post project related documents at business places or other accessible locations within the community for public comment;
 - iii. Conduct virtual meetings with key stakeholders as well as statutory and advisory agencies.
- 7.3 The Applicant shall identify all relevant stakeholder groupings, such as project beneficiaries, adversely affected groups/individuals, interested parties, as well as relevant government agencies/authorities, non-governmental organisations and other members of the public that may be affected by the project and facilitate specialised discussions/fora (such as those identified below) with these stakeholders;



7.4 A first round of engagement exercises must be held prior to initiation of studies for the project; to engage with and garner feedback from all identified stakeholders; where such exercises have been previously held, documentation as outlined below must be provided with a justification demonstrating how all the relevant information was shared with the stakeholders, feedback provided and how the feedback was incorporated into studies already conducted for the project.

The following information must be presented during this first round of, or during any subsequent/follow-up engagement exercises:

- Purpose and need for the project;
- All relevant project alternatives and designs (including the “no action” alternative);
- All alternatives that satisfy the purpose and need for the project;
- Description of all alternative actions or projects that were/are/being considered;
- Description of initial environmental impact assessment processes and results (i.e. impacts/risks and mitigation measures);
- The precise location of the project and its components;
- The activities to be undertaken by the Applicant;
- All logistics associated with the activities, including use of resources, infrastructure, scheduling and duration of activities;
- Anticipated impacts/risks associated with the project and proposed mitigation measures; and
- Studies to be undertaken as part of the project.

Additional rounds of engagement exercises must be held, which must include, but not be limited to, the same stakeholder groups as the first/subsequent/follow-up round(s) of engagement to provide results of previously identified concerns and queries as well as relevant studies, demonstrate how potential impacts will be mitigated and if and how their initial concerns would be addressed and/or incorporated into the project design.

These engagement exercises shall be scheduled to allow all stakeholder groups, adequate time for assimilation and assessment of the information presented and submission of concerns. Information must be graphic, concise, clear and designed in a manner that is easily understood by all and to elicit participation;



- 7.5 Each engagement exercise must be prominently advertised to the public and in the local areas. Such exercises may take the form of public meetings, open houses, question-and-answer sessions, surveys, focus group meetings, workshops with parallel discussions of key issues, virtual platforms and any other formats appropriate for their intended audience; consideration shall be given to alternative media to host engagement exercises given the current National Public Health regulations and guidelines;
- 7.6 The Applicant is advised that these afore-mentioned engagement exercises are only a minimum requirement and additional exercises may be necessary throughout the project life cycle to ensure that all concerns and issues are brought to the fore and measures incorporated to address such issues/concerns, as far as practical. The Applicant may also choose to conduct independent consultations or focus group meetings with stakeholders as it sees fit;
- 7.7 An appropriate number of copies of the relevant document(s), summarising the project must be placed at locations where the document can be easily accessed/referenced by members of the public and other stakeholders at least two (2) weeks prior to the scheduled stakeholder engagement exercise;
- 7.8 The Applicant shall ensure that it has experts along with project (company) personnel who are authorised to make a decision/pronouncement on the project and are able to respond to questions and concerns in their respective fields. After each engagement exercise, the Applicant will be responsible for providing additional information in response to questions or concerns raised which may not have been fully answered/answerable during particular meetings/forum, in a timely fashion. The manner in which feedback is to be provided to stakeholders must be clearly explained. After each forum, the facilitation team will document information provided by the Applicant, and summarise questions, especially those that pertain to potentially significant project impacts, raised and the Applicant's responses to those questions.

7.9 Public Meetings

The following guidelines shall be followed for public meetings, considering the most up-to-date Ministry of Health Guidelines and Regulations:



7.9.1 Location

- a) Virtual platform(s) considered for meetings shall be easily accessible to interested participants and communities that can be directly affected by the project, and with the capacity to accommodate at least 100 persons. Meetings shall be held at a time that is best suitable for maximising attendance/participation. Physical meetings shall take into consideration the most up-to-date Ministry of Health Guidelines.

7.9.2 Advertising

- a) The meetings shall be advertised on social media, local media and at least one (1) national daily newspaper at least one (1) week before the date of the meeting. The advertisement should occupy at least one quarter of a page in the newspaper and should be bold and noticeable.
 - b) Flyers of at least 8 1/2" by 11" in size shall be placed at popular stops within the communities such as but not limited to, fishing depots, gas stations, supermarkets, local shops, banks and drugstores or within daily newspapers circulated within the communities (this service can be accessed via the newspaper houses). Fonts on the flyers shall be bold and noticeable;
 - c) Letters or other measures of communication to those stakeholders who may not reside in the affected communities.
 - d) Other means of advertising may be used, such as radio and television announcements, public announcement systems, announcements in community organisations such as community centres, churches, etc.
- 7.10 Stakeholder Engagement Format The Applicant or representatives authorised to make project decisions (the facilitator) shall identify themselves and inform attendees of the purpose and need for the stakeholder engagement, the reason that stakeholder input is being sought, i.e. to garner stakeholder feedback for consideration in the final project design, and that specifically that a CEC is being sought from the EMA to proceed with the project;



- 7.10.1 Consideration shall be given to the incorporation and use of the most appropriate Information and Communications Technology tools to facilitate stakeholder engagement exercises/specialised fora given the most recent National Public Health Regulations and guidelines. During the aforementioned, the Applicant or representative(s) of the Applicant shall give a clear and concise synopsis on the project as detailed above;
- 7.10.2 All persons shall be given an opportunity (fair hearing) to express any concerns on any one or several of the project's components;
- 7.10.3 All comments/questions from the meeting(s) shall be documented and submitted as the Stakeholder Engagement Report within the EIA Report, including a verbatim record of the proceedings;
- 7.10.4 The information gathered shall be representative of all stakeholders and shall address the concerns raised during the consultation process. The Stakeholder Engagement Report must demonstrate that public and stakeholder concerns have been adequately considered and addressed within the document. This must be appropriately documented and included in the Stakeholder Engagement Report;
- 7.10.5 The Stakeholder Engagement Report shall also contain details on the manner in which the public and other stakeholders were notified, the groups targeted, a description of the stakeholder engagement process, a list of all stakeholders included in the process, the number of engagement exercises held, location of the exercises, dates held, minutes of all engagement exercises, a copy of the surveys/questionnaires used (if any), and the results of such. Any uncertainties and gaps in the collected data as well as challenges encountered during the data collection process and the manner in which such gaps were addressed, should be highlighted;
- 7.10.6 A plan on how stakeholders will continue to be engaged during the project lifecycle (implementation and operations) must also be provided in the Stakeholder Engagement Report.

7.11 Grievance Redress Plan

Establishing a Grievance Redress Plan (GRP) is an important part of mitigating environmental and social risk. A GRP is required when there is a risk of potential adverse impacts, actions and/or results related to project activities or programmes.



People may also communicate concerns and complaints about the nature of the consultation process itself, for example if some feel excluded. Affected stakeholders, whether individuals or groups, should have access to a transparent, fair, and equitable mechanism that can act with a degree of independence from the project.

The Applicant must formulate a mechanism for addressing external grievances as part of its stakeholder engagement plan, which should serve four (4) purposes:

- Decision making related to project design and development, i.e. form part of a project management system;
- A mechanism for timely resolution of an issue and prevention of the escalation of problems into social conflict;
- An accountability mechanism, where people can seek remedy when needed without fear of costs or retribution; and
- Embodiment in the project's monitoring and evaluation process, and thus contribute to institutional learning.

A project-specific GRP must be established and operational throughout the project life cycle and incorporate the following:

- a) An understandable, accessible and culturally appropriate grievance process (i.e. how people are informed about the GRP and its purpose);
- b) Appropriately scaled mechanism(s) to address project and stakeholder needs;
- c) Clear and public process for handling grievances (i.e. who is responsible for managing queries, concerns and/or complaints; the manner in which queries, concerns and complaints related to the project are received; the procedure to be followed to address/manage queries, concerns and complaints, including proposed turnaround times; accessibility to community liaisons, etc.);
- d) Mechanism for mediation by third parties, where required;
- e) Transparency (i.e. the manner in which queries, complaints and/or concerns are received, documented, treated, resolved and how resolution actions are monitored);
- f) Good record-keeping protocols to facilitate effective grievance management (i.e. the manner in which resolution outcomes will be documented and communicated); and
- g) Free access to legal remedies.

The GRP must be included in the stakeholder engagement forum to allow for an early understanding of the grievance redress mechanism and submitted as part of the Stakeholder Engagement Report.



8.0 Analysis of Environmental, Natural and Climate Change Impacts

- 8.1 The Applicant shall identify all impacts that could arise during each phase of the project and distinguish, where applicable, between negative and positive impacts, direct and indirect impacts, immediate, short-term and long-term impacts, and cumulative impacts;
- 8.2 The Applicant shall provide a description of the vulnerability of the project, inclusive of proposed structures and design, to natural hazards and climate change impacts including increases in temperature, changing rainfall intensity, dry spells, drought and associated lowering water levels as well as changes in the frequency, magnitude and distribution of any natural hazard or climate change element affecting the spatial or temporal boundaries of the proposed project. This shall consider the effects of the current climate on the project, as well as prediction of the future environmental impacts related to climate change on the project. Prediction of impacts may be achieved through the review of research and information published by reputable bodies which will aid in understanding of future climate trends within coastal and marine areas over the next 20 to 100 years;
- 8.3 To illustrate significance, direct comparisons should be made between estimates of the potential impacts and the baseline conditions for given parameters/indicators;
- 8.4 The Applicant shall also describe impacts quantitatively, as far as possible, and shall consider those that can occur in unforeseen circumstances. The reliability of forecasts and predictions shall be indicated as appropriate;
- 8.5 The Applicant shall utilise models of physical, chemical and geochemical processes to aid in the understanding of predicted changes within the terrestrial, coastal and marine environments, where applicable;
- 8.6 The Applicant shall also provide data from other existing activities using the same technology with which to compare, or assist in the prediction of impacts for this proposed project, where applicable;
- 8.7 Impacts must be categorised and illustrated using an appropriate format e.g. matrices where applicable;
- 8.8 A method of determination of impact significance must be clearly outlined, including specific significance criteria that would allow the reader to understand the level of impact of the project on key ecological and socio-cultural components and how these levels were estimated;



- 8.9 Areas of impact/hazards shall be illustrated in map form and those that are unavoidable or irreversible must be specifically identified. Significant changes to baseline conditions shall also be quantified where possible;
- 8.10 A determination of residual impact significance shall be provided for each key environmental or socio-cultural component (by major phase or activity) after considering the application of proposed mitigation measures (i.e. rank the significance of residual effects following mitigation. Proposed mitigation measures to reduce adverse impacts and measures to enhance benefits must be clearly described;
- 8.11 A list of all Applicant commitments for mitigation, monitoring and follow-up measures must be clearly recorded and included in the Environmental Management Plan;
- 8.12 The potential impacts to be discussed include, but are not limited to, those related to:
 - 8.12.1 Potential exacerbations or reduction of natural hazard impacts, both on- and off-site explaining significant information deficiencies and any uncertainties associated with the predictions;
 - 8.12.2 Human beings – including, but not limited to, such aspects as:
 - i. The potential for changes to water, soil/sediment and air quality that might increase human exposure to contaminants directly and/or indirectly (e.g. through bioaccumulation effects);
 - ii. Social impact as it relates to natural resource management, demands on utility availability and local services; local employment and training; lifestyle and culture; capability to maintain livelihoods; use of the project area (i.e. temporary or permanent dislocation of users and vulnerable groups that may frequent the study area); the potential loss of amenities and/or earnings to traditional users of the area;
 - iii. The availability of employment during the different phases of the project (site preparation, construction, operation) should be quantified and defined in terms of temporary vs. permanent, skilled versus unskilled and availability during the different phases of the project. In addition, assess the capability of the local population to participate in any employment opportunities afforded by the project;

- iv. Impact on traffic, including marine traffic, during all phases of the project;
- v. The cumulative health effects that are likely to result from the project in combination with other existing, approved, and proposed projects (projects that have been advanced to the public disclosure stage);
- vi. Identify and discuss the data and methods used to assess the impacts of the project on human health and safety;
- vii. Disruption of access to and use of the foreshore as a result of changes to coastal processes and/or physical infrastructure;
- viii. Disruption to the quality of life as perceived by recreational, historical, cultural and traditional beach users, divers and other stakeholders, including the potential impact to the aesthetic value of the study area.

N.B. This assessment shall include identification and discussion of methods and data used to assess the impacts of the project on the socio-cultural environment. The Applicant shall use a Social Impact Assessment approach to determine measures that will address community expectations.

8.12.3 Air Quality - impacts to the receiving environment (including potential changes to baseline air quality) as a result of project activities including, but not limited to, such aspects as:

- i. Dust – discuss the generation and movement of dust offsite during the site preparation, construction and operational phases (such as dust from the storage of input material on site) of the project;
- ii. Provide an emissions profile (type, emission rate, concentrations, source etc.) for proposed development, and a discussion of the expected emissions from equipment and vehicles to be used for the project. Emissions should be presented in mg/Nm³;



- iii. Discuss the potential for cumulative impacts on ambient air quality during construction activities with other existing or approved construction activities within the study area; assess cumulative impacts on ambient air quality from emissions during operation and maintenance activities with other existing or approved projects for the study area, and assess the potential for reduced air quality;
- iv. Discuss any implications of the expected impacts to air quality for environmental protection and public health;
- v. Assess the impacts of the project on the micro-climate of the study area, where applicable;
- vi. Climate Change – Greenhouse Gas (GHG) emissions and climate change impacts shall include:
 - a. Estimates of the GHG emissions during all phases of the project in relation to carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Substantive emission sources shall be identified and quantified;
 - b. Assessment of potential hazards expected from climate change variability on the project.

8.12.4 Water quality – including, but not limited to, such aspects as:

- i. Impact of the project on surface water quality (including changes to baseline levels) and the potential for contamination from any aspect of the proposed development. Emphasis should be placed on the potential impact to receiving water quality during dredging, reclamation, piling and construction, as well as runoff, effluent discharge (if applicable) and leaks from vessels during the operational phase of the project. A scoping exercise (based on the intended activities to be carried out during the operational phase of the overall development) should be conducted to identify all relevant parameters of concern, where changes from the baseline are anticipated;

- ii. The impact of any discharge, inclusive of spills during construction, normal operation and emergency conditions on the ambient water quality in the study area; the cumulative impacts of continuous/long-term discharge at the proposed site outfall point(s) of the project site including comparison of discharge parameters with those prescribed in Schedule II of the Water Pollution Rules 2019.

8.12.5 Physical marine and coastal zone environments, including but not limited to, such aspects as:

- i. A zone of likely seabed disturbance by the coastal activities should be identified, and environmental sensitivity should be addressed with respect to long-term coastal processes. Discuss and quantify, where applicable, the impact of the project in terms of changes in waves, currents, tidal flows, scouring, flushing and circulation, dredging, reclamation or deposition of dredged/seabed material;
- ii. The implications of project with respect to, changes in the wave climate; sediment transport processes; shoreline behaviour, and long-term coastal evolution. This should include discussion and quantification of the impacts of project components (e.g. reclamation, the dredged areas, marina resort, restaurant, marina, causeways, waterpark, saltwater lake, other associated infrastructure and the coastal defense structures) on the sediment supply and sediment budget of the bay area, as well as the impacts on erosion and accretion rates and sediment transport patterns in the study area and in adjacent areas. Particular attention should be paid to the direct and indirect impacts on surrounding recreational beaches along the bay area. Appropriate models shall be utilised to predict/quantify the impacts of the project components on the receiving environment;
- iii. Predict/estimate impacts to the shoreline from the wake of the movement of marine traffic within the project area during the operational phase of the proposed project;
- iv. Identify and quantify any changes to riverine (if applicable), coastal and seabed morphology including bathymetry and beach profiles at the site, or on the adjacent coastlines, likely to occur as a result of the proposed project;



- v. Provide details of the cross-section and plan shape of the reclamation area and coastal protection structures and an assessment of the stability of these structures/reclaimed area under normal and storm conditions, including existing wave conditions and predicted hurricane wave and water level conditions, for a 1 in 50 year event and 1 in 100 year event;
- vi. Identification and prediction of any potential construction phase impacts, for example relating to elevations in background suspended sediment concentrations. Such assessments should predict the plume of suspended sediments arising from dredging and reclamation activities, along with the fate of disturbed sediments;
- vii. The assessment should also address the indirect impacts of the project works on other non-adjacent areas and potential effects on vegetation/habitats (i.e. coastal nearshore and marine);
- viii. Investigate and report on the actions proposed to mitigate or accommodate impacts on coastal processes/management.

8.12.6 Hydrodynamic modelling studies shall be used to determine the impacts of the development on the hydrodynamic and sediment transport regime, wave refraction, reflection and diffraction patterns and tidal flushing/inundation of any watercourses and wetland areas within the study area. The source and type of the particular model(s) chosen must be clearly referenced, and the reason for the selection stated, along with model limitations, input parameters chosen, and the methods used for their validation. Justification for the various input parameters used during modelling (e.g. wave and current data, sediment sources, sediment particle size and distribution) must be clearly stated. Modelling shall be based on the occurrence of predicted typical and worst-case events.

Where applicable, the findings of hydrodynamic modelling studies shall be used to understand the spatial distribution of risks to receptors in the study area, such as but not limited, to direction and dispersion of discharges and spills. Site-specific data of at least two (2) months wet season and two (2) months dry season shall be used to validate and calibrate the model. This data should be collected at least four (4) months apart to allow for seasonally induced forcing to be established and observable. Monitoring and dredging schedule (if applicable) should be outlined based on the modelled erosion rates;

8.12.7 Solid, semi-solid and liquid waste

- i. Identify the activities during all phases of the project that may produce both hazardous and non-hazardous solid, semi-solid and liquid waste; and
- ii. Assess the possible impacts associated with the types of waste generated, including their treatment and disposal; provide details of the methods for treatment, and other solid waste generated during the site preparation, construction and operational activities.

8.12.8 Dredge Spoil Disposal

- i. Conduct a screening level assessment of the sediment quality within the area to be dredged (to the proposed maximum depth to be dredged). If this assessment demonstrates the likelihood of contaminated dredge spoil, a sediment quality study must be conducted.

This sediment quality study shall include, but not be limited to, the following:

- A detailed description of the method of sampling and a rationale for the selection and use of the particular method;
- The number and location of all sampling points included within the study area. This should be illustrated on a map to facilitate comprehension of the location of the sample points, in relation to the existing environment.

N.B: The number of samples should be selected according to the National Assessment Guidelines for Dredging, Commonwealth of Australia, 2009 (latest version) or equivalent;

- Information on all methods used in the analysis of samples. This should also include detection levels for all parameters tested;



- Results of all tests conducted, compared with acceptable international standards/guidelines. Samples shall be screened for, but not be limited to; total petroleum hydrocarbons (TPHs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), heavy metals (e.g. barium, chromium, lead, mercury, zinc) and tributyl tin (TBT). A scoping exercise, based on the activities to be conducted within the overall development, shall be carried out to determine additional relevant parameters of concern. Where results indicate that contaminants are present above upper benchmark levels, bioavailability tests should be conducted;
 - Guidelines for the conduct of these assessments shall be in accordance with acceptable international standards (such as, but not limited to, Canadian Disposal at Sea Regulations, National Assessment Guidelines for Dredging, Commonwealth of Australia, 2009 (latest revision), Guidelines for Dredging, Environment Protection, Southbank Victoria, Australia, etc.).
- ii. Assess the impacts related to the re-use of the dredged material on the receiving environment where it is being proposed for use in reclamation activities.

8.12.9 Flora and fauna including, but not limited to, such aspects as:

- i. Physical impacts on terrestrial, aquatic (i.e. riverine), coastal and marine habitats, where applicable;
- ii. Impacts to the environment that may result from increased marine and vehicular traffic associated with the different phases of the project;
- iii. Impacts to any ESS or commercially exploited species and sensitive habitats that may result from the proposed activity and the physical and/or chemical alterations that will take place;
- iv. Immediate and long-term effects (direct and indirect impacts) on existing fisheries, nurseries, tidal habitats and marine flora and fauna (e.g. sea grass beds, reefs and spawning areas and times for fish, wetland nurseries and crustaceans) of the proposed development due to the silt/sediment plumes from reclamation and dredging activities;

- v. Expected changes in the health of flora and fauna that will result from the expected/potential changes in water (surface and marine), soil and sediment quality. This should include any expected changes to species count and diversity, changes in behaviour and nesting patterns within the study area. The assumptions used for making such correlations should be explained;
- vi. Wider impacts on coastal and marine ecology of the study area as effects are transferred along the food chain (i.e. bioaccumulation and bio-magnification);
- vii. Potential impacts on the ecological relationships, biological productivity and sensitivity/vulnerability of the floral and faunal species within the terrestrial, coastal and marine environments. Particular emphasis should be placed on species that may be affected by the overall project;
- viii. Ecological impacts that may result from accidental oil/diesel/chemical spills as well as boat collision;
- ix. Potential for loss of biodiversity within the inter-tidal, coastal nearshore, riverine (if applicable) and marine areas, including but not limited to, potential impacts on spawning, nesting, feeding and other animal behaviours, such as migration;
- x. Physical loss of habitats and species at the reclamation and dredging sites, as well as locations for other associated marine components, access points as well as at the footprint of the coastal protection structures;
- xi. Benthic environment – effects of potential smothering of benthic communities during the establishment of the associated marine components of the development and coastal protection structures; potential impacts on the benthic communities at the area(s) earmarked for dredging, and reclamation and any proposed dredge spoil disposal site for excess dredge spoil, if applicable;
- xii. Potential impacts on feeding, spawning, recruitment and nursery areas;
- xiii. Potential impact of the introduction of alien invasive species by incoming vessels;
- xiv. Impact of the potential colonisation of coastal structures during the operational phase of the development by primary and secondary producer organisms, such as but not limited to periphyton, and macrozoobenthos; ecological impacts of this colonisation;



- xv. Estimate the potential for increased noise (including underwater noise) resulting from the conduct of the project's activities, i.e. during all phases of the project (i.e. mobilisation, dredging and site preparation, reclamation, construction, operation and maintenance phases). Identify potentially affected species and state the implication of any increased noise levels on these species.

8.12.10 Noise and vibrations including, but not limited to, such aspects as:

- i. The impact of noise and vibration during all phases of the proposed development on fauna (including nesting, feeding and other animal behaviour such as migration) within the study area; this should include both short- and long-term impacts; the fauna considered should include those mentioned above, as well as any endangered/protected and or sensitive species;
- ii. The impacts of noise and vibration on human receptors, human activity and existing infrastructure.

8.12.11 Light – estimate the potential for increased light that may result from the development (i.e. operational lighting of the buildings within the development, as well as warning/safety lights within the marine perimeter). Potentially affected sensitive receptors, such as but not limited to marine turtles, must be identified and the implication of any increased light on these receptors described, including any cumulative impacts;

8.12.12 Traffic - Impacts on the passage of marine and land-based traffic in relevant affected areas, during the construction and operation phases of the overall development;

8.12.13 Impacts of land clearing activities, such as, but not limited to, changes in the aesthetical value of the area, erosion of material and increased sediment loading of the nearshore coastal environment;

8.12.14 Impacts on archaeological and historical sites, as well as cultural resources of interest, if applicable;



- 8.12.15 Impacts on scenic views, vistas and aesthetics;
- 8.12.16 Assess the ability of the proposed structures (i.e. piled structures, coastal protection structures, and reclaimed parcel) to support , marina, boardwalk, causeways, hotel restaurants, recreational areas and associated facilities (i.e. an assessment of the long-term stability of the site);

9.0 Cumulative Impact Assessment

The description of impacts shall include an assessment of the cumulative environmental impacts that are likely to result from the proposed activities in combination with other existing, approved and proposed projects in the area that could reasonably be considered to have a combined effect;

The cumulative assessment must be based on an adequate understanding of the design and operation of the proposed facilities and infrastructure, as well as other existing, approved and proposed projects. Cumulative impacts shall either be described within a specific section of the EIA Report, or be well defined within each of the report's sub-sections on potential impacts, as relevant;

The cumulative impacts associated with other existing or proposed activities identified within the defined study area (i.e. immediate and wider study area) to be determined include, but are not limited to, the following:

- (a) Relate potential impacts from the proposed activity with existing impacts from other activities within the wider area and particularly among communities within the project's study area, in terms of effects to the social climate and civil amenities/infrastructure;
- (b) Relate potential impacts of sea level rise and climate change to the design and maintenance of the proposed facilities and associated infrastructure.

10.0 Assessment of Risk

10.1 Risk Assessment

A suitable and sufficient qualitative, semi-qualitative or quantitative assessment of the risk to the health and safety of the public must be conducted for the fuel storage/bunkering activities, as well as any other identified risk/s for the proposed development. The type of risk assessment chosen must be justified.

The terms 'suitable and sufficient' implies the following:



- A decision framework should be used and documented in the risk assessment report on the identification of potential hazards/sources for the project. The rationale for the selection of significant hazards/sources to be assessed must be included in the report. The output of the risk estimation should be a list of hazards/sources in ranked order of importance for consideration;
- The potential consequences of each release scenario (e.g. storage tank leaks, leaks from piping and equipment, explosion hazard as a result of the formation of an explosive gas mixture) should be identified and justified. Consequence modelling should be carried out to predict the spatial distribution of these effects on the public offsite. A description of the assessment methodologies used for predicting the consequences of the significant hazards should be provided in the risk assessment report. A rationale for the choice of the consequence model(s) and their appropriateness for this project should be provided in the report;
- The failure frequencies (including data sources/references) used in the risk calculations should be provided. Justification of the applicability of these data for use in Trinidad and Tobago with respect to local conditions (including seismic conditions and extreme weather – e.g. storms and associated effects such as flooding and storm surges) should be presented;
- The individual and societal risks of the identified significant hazards must be presented. Individual risk is defined as the cumulative risk due to all the identified significant hazards. The risk calculation methodology should be documented in the risk assessment report. Any assumptions (e.g. frequency of meteorological conditions and indoor/outdoor exposures) should be documented and justified in the report;
- Individual risk results should be presented in a contour plot showing isopleths of individual risk around the proposed facilities on a map of the area showing population data. Results of the societal risk calculations should be presented in the form of an F-N plot;
- Appropriate risk control must be identified for hazards that pose a significant risk, based on established risk criteria using the ‘as low as is reasonably practicable’ (ALARP) principle. The findings of the risk assessment should be used to identify and prioritise risk management strategies that include prevention, control, protection and mitigation of risks to the ALARP principle.



The reasoning for or against the choice of particular risk-reduction measures to be implemented should be clear, well documented and justified in the report. Detailed design of these mitigation measures is not required for the risk assessment report. However the mitigation measures that will be adopted and included in the final project configuration must be clearly identified.

The risk assessment should be carried out to assess and quantify the risk of occurrence of significant hazards during all aspects of construction and operation activities including, but not limited to:

- Storage tank leaks or failures;
- Equipment/piping leaks or failure due to corrosion and wear;
- Explosion hazard as a result of the formation of an explosive gas mixture and the potential of this to generate extensive offsite risk;
- Flash fires, pool fires and liquid spray fires (where applicable);
- Any other significant hazards/consequences identified during the risk assessment.

The results of the risk calculations should be compared to the following criteria:

- Individual risk: Acceptable level for public - less than 1×10^{-6} per year;
- Societal risk: Unacceptable societal risk based on the line on an F-N plot through point (0.01, 1) with a slope of -1, and negligible societal risk based on the line on an F-N plot through point (0.0001, 1) with a slope of -1.

The risk assessment studies should also inform/advise the Applicant on the formulation of an Emergency Response Plan (ERP) and the additional measures that can be taken to assist in managing safety, such as the establishment of adequate buffer zones.

11.0 Emergency Response Plan

The Applicant shall formulate a conceptual, project-specific Emergency Response Plan (ERP) for the project including additional measures that can be taken to assist in managing safety. The plans to respond to emergencies, incidents and accidents, including vessel collision, pipeline rupture, hydrocarbon and chemical spills must be described. A conceptual ERP should discuss, but not be limited to, such aspects as:

- a. The rationale and/or design basis for key equipment and processes being used in the programme, including the location and availability of key equipment for the various Tier levels and emergency response;
- b. An outline of the components and structure of the emergency response team, defining their qualifications and roles as emergency response team members;



- c. A description of how any potentially impacted users of the area and populace will be contacted during an emergency, the type of information that will be communicated to them and their involvement in the emergency response mechanism;
- d. A conceptual Hydrocarbon Spill Contingency Plan which includes a description of the proposed agreements with authorities, emergency response associations or industry groups, to help deal with emergencies or adverse situations. This plan shall be in alignment with the requirements of the National Oil Spill Contingency Plan (NOSCP) (the most recent revised version) and include arrangements that will be made by the Applicant to facilitate Tiers I, II and III Spill Responses, in terms of source, quantity and availability of resources, prior to a hydrocarbon spill event;
- e. Emergency reporting procedures and management of the results;
- f. The ERP should also make provision for training of relevant stakeholders on the response requirements in the event of an emergency.

12.0 Mitigation Strategy and Environmental Management Plan

- 12.1 In consideration of significant adverse impacts that were identified in relation to Sections 8 and 9 above, the Applicant shall propose realistic, feasible measures by employing Best Available Technologies Not Entailing Excessive Cost (BATNEEC) and Best Practicable Environmental Options (BPEO) to avoid, mitigate or remedy such impacts to acceptable levels. These should satisfy, and show comparison with, local environmental, health and safety standards/guidelines and, where these are not available, international standards/guidelines shall be used;
- 12.2 Mitigation measures can be best addressed in the form of an Environmental Management Plan (EMP) that must be formulated and submitted. The EMP shall be a framework management plan for the project that seeks to manage health, safety and environmental issues resulting from the proposed project. The EMP must identify potential negative impacts of each phase of the project and describe the specific measures to be taken to avoid, manage or compensate for identified potential negative impacts. Mitigation measures shall specifically describe how existing pollution, if any, would be handled to prevent a cumulative impact with respect to the intended project;
- 12.3 The EMP shall also include a table that summarises potential impacts, and describes mitigation measures that will be used. Details to be included within the management plan shall comprise, but not be limited to:



- i. Environmental Policy of the company and specific objectives of the plan;
- ii. Detailed description of the appropriate mitigation and compensatory measures, with equipment and resource requirements for carrying out these plans, and a description of operational procedures (as appropriate) to respond to these impacts, or to avoid or reduce risks;
- iii. Requirements for ensuring that responses to predicted impacts are accurate and effective, and an implementation schedule (timing) for mitigation measures that must be carried out as part of the project;
- iv. A Hazardous Materials Management Plan including, but not limited to, such aspects as spill management handling, disposal and tracking of hazardous waste from its source, during transportation and to its ultimate destination. The management of hazardous waste must comply with all relevant legislative and regulatory requirements;
- v. The principles that have been incorporated into the project design for pollution prevention and waste minimisation.

13.0 Monitoring and Intervention Strategy

- 13.1 Describe and detail the ways in which the impacts of the proposed project are to be monitored and measured;
- 13.2 A detailed monitoring plan must be provided for the different aspects of the project to ensure that mitigation measures are achieving their objectives. Such plans shall include, but not be limited to information on the organisation/entity responsible for monitoring, proposed methodologies for sampling and analysis, monitoring locations and frequencies and relevant quality assurance/quality control (QA/QC) data;
- 13.3 Describe and detail any contingency plans that will be implemented in cases where monitoring indicates that mitigation measures are not meeting their objectives;
- 13.4 Monitoring programmes shall address the physical, biological and socio-cultural impacts of the project, as well as adaptation measures to monitor climate change impacts during all phases of the project;
- 13.5 The parameters/indicators to be monitored and their respective frequencies of measurement must be detailed;



- 13.6 Include also any monitoring programmes that the Applicant is proposing to conduct collaboratively with other stakeholders. Include in this programme a description of the role and responsibilities that the Applicant will be taking in each of these programmes;
- 13.7 The Applicant shall devise mechanisms for sharing results, reviewing findings and adjusting programmes, should monitoring identify unanticipated consequences of its operations or mitigation plans, including:
 - a. Corporate adaptive management strategies;
 - b. Consultation with regulators, public stakeholders and, if necessary, relevant management fora.



ANNEX 3A

DETAILED REQUIREMENTS FOR THE EIA REPORT

1. The EIA Report shall be concise and limited to significant environmental issues and must provide all the relevant information needed by the regulatory agencies to consider fully any adverse or beneficial impacts of the proposal. It is envisaged that the EIA will be based on the results of available research (including any preliminary results from research through consultation with research organisations), studies and data as appropriate, with further studies being conducted where necessary and practicable. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment shall be discussed.
2. The main text shall focus on findings, conclusions and recommended actions, supported by summaries and analyses of the data collected, as well as citations for any references used in their interpretation. Unpublished documents, detailed data and other relevant documents such as modelling reports and Safety Data Sheets (SDS), must be presented in appendices. Where the EIA utilises the results of previously conducted research, appropriate references and a listing of individuals and organisations consulted must be included. The public availability of data and studies utilised shall also be indicated. Methodologies for all data collection and analyses (including quality control measures) must be included in relevant appendices.
3. Wherever practical, maps, flow diagrams, charts and photographs directly referred to in the main text shall be included in the relevant section of the main body of the document.
4. The introduction to the EIA shall provide an explanation of the scope of the proposal and the issues and decisions which led to the proposal at this time and in this context — including a history of events leading up to project formulation and alternatives considered, envisaged time scale for implementation and project life, anticipated establishment costs and actions already taken at the project site.

The introduction shall also briefly describe the study area and regional setting for the proposal (with reference to any maps as appropriate), including land-use and tenure, and describe the studies/surveys/consultations that have been conducted in developing the proposal and preparing the EIA Report. The completed studies and detailed comments resulting from consultations must be included as appendices. The EIA Report shall provide a listing and description of the approvals needed for the proposal to proceed.



5. A suggested format of the EIA Report is outlined below:

- Executive (Non-technical) Summary;
- Table of Contents;
- Glossary of terms/abbreviations/acronyms;
- List of preparers including their professional qualifications and experience on similar projects;
- Summary of Methodologies (detailed methodologies should be presented in an Appendix);
- Legislative and Regulatory Framework;
- Institutional and Financial Mechanisms;
- Description of the Proposed Project;
- Definition of the Study Area;
- Description of the Environment and Socio-cultural characterisation of the study area;
- Analysis of Alternatives;
- Stakeholder and Public Engagement - Inter-Agency and Public/NGO Involvement, including Grievance Redress Plan;
- Analysis of Environmental, Natural and Climate Change Impacts, including Cumulative Impacts;
- Assessment of Risk;
- Emergency Response Plan;
- Mitigation Strategy and Environmental Management Plan
- Monitoring and Intervention Strategy;
- Inter-Agency and Public/NGO Involvement;
- List of References;
- Appendices:
 - CEC Application Form A and Final Terms of Reference;
 - List of Stakeholder Engagement, Inter-Agency and Public/NGO Communications;
 - Minutes of meetings and transcripts of public meetings;
 - Description of methodologies for data collection analysis;
 - Site plans, elevations, schematics;
 - Data sets.

Note: All pages are to be numbered and the metric system of units is to be used consistently. The report shall be formatted in size 12, 'Arial' font.



ANNEX 3B

MAPPING AND USE OF GEOGRAPHICAL INFORMATION SYSTEMS

- 1) Mapping (i.e. spatial data to scale, represented in digital or printed format) must be presented at easily understood and appropriate scales to illustrate the spatial extent of the project and the impact area.
- 2) Geographical information systems (GIS) shall be used to represent spatial data wherever practicable. Submitted data shall be presented in a working GIS project compatible with ArcView 10.x and be organised into discrete themes (i.e. shape files, point, raster and vector data). Data themes shall illustrate, but not necessarily be limited to, the following features/attributes:
 - Study area boundaries (e.g. immediate and wider study areas);
 - Land use of the immediate and wider study areas;
 - Non-built development such as agriculture, forested areas/reserves, recreational areas, natural features etc.;
 - Built development (e.g. residential, commercial, institutions, etc);
 - Coastal zone/marine ecological features and zones such as reefs, seagrass beds, mangroves, other wetland systems and different benthic communities, where applicable;
 - Water resources such as rivers/streams, municipal wells, watersheds, standing water bodies, where applicable;
 - Flora, including endemic species and faunal habitats;
 - Soil, sediment and geology;
 - Topography (contour lines at appropriate intervals, preferably employing the metric system) including derived digital elevation models (DEMs) and triangulated irregular networks (TINs);
 - Bathymetry (contour lines at appropriate intervals, preferable in metric units);
 - Sampling points for baseline data;
 - Administrative areas (e.g. municipalities);
 - Any existing and proposed oil/gas well sites and associated infrastructure, including pipelines etc.;
 - Proposed monitoring stations/points;
 - Intended effluent points;
 - Protected/Managed/Prohibited Areas/Reserves, including areas considered to be ecologically sensitive;
 - Proposed buffer and exclusion zones;
 - Conceptual Emergency operations (e.g. evacuation routes, shelters, fire zones and explosion zones); and
 - Known archaeological sites and sites of historical, cultural and conservation interest.



3. Digital data themes or shape files should be clearly labelled/annotated with supporting metadata.
4. Map units and distance should be set in metres and in relation to UTM Zone 20N coordinate system, WGS84 datum.
5. The use of GIS should not otherwise exclude the use of photographs, map sheets and diagrams at easily understood and appropriate scales to illustrate the spatial extent of the project and the impacted area. Such photographs should be indexed with the map sheet to aid in the illustration process. Updated high resolution aerial and satellite imagery should be used as reference data and must be ortho-rectified so that they align perfectly with digital data themes.
6. Printed maps of the site area shall clearly indicate the layout of the facilities in the context of the immediate site, as well as relative to the wider study area. Each printed map shall be at appropriate/easily-understood scales for the overview being illustrated (e.g. 1:10 000 or 1:5000 for site plans) and shall be inserted at the point of reference in the text in the EIA Report. In the event that any of the maps are large and/or bulky, these should be incorporated into one of the appendices, as appropriate.
7. All maps and figures shall adhere to the following guidelines:
 - i. Spatial data shall be appropriately scaled;
 - ii. Map/figures shall be legible and include proper legends/keys;
 - iii. Maps/figures shall be dated and the source of the datum stated;
 - iv. Maps/figures shall include an appropriate scale and a north arrow;
 - v. The use of scanned documents, texts or graphics is not acceptable and should be avoided.
8. Mapping (i.e. spatial data to scale, represented in digital or printed format) must be presented at easily understood and appropriate scales to illustrate the spatial extent of the project and the impact area.

