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## GLOSSARY OF TERMS

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**Algae:** one celled or many celled plants that have no root, stem, or leaf system.

**Avifauna:** birds

**Bathymetry:** is the study of underwater depth of the seafloor or seabed. This type of study is important in analyzing the profile of the seafloor

**Beach:** sediment seaward of the coastline through the surf zone that is in transport along the shore and within the surf zone.

**Benthic:** pertaining to the ocean bottom or seafloor.

**Benthos:** the forms of marine life that live on the ocean bottom or seafloor.

**Biogenic Sediments:** sediments containing materials produced by plants or animals such as corals, shell fragments and tests housing diatoms and radiolarians.

**Biomass:** total weight of the organisms in a particular habitat, species, or group of species.

**Biota:** the total plants and animals of a given area.

**Coast:** a strip of land that extends inland from the coastline as far as marine influence is evidenced in the landforms.

**Coastline:** landward limit of the highest storm waves' effect on the shore.

**Coliform:** Type of bacterial found in feces.

**Construction:** excavation, movement of earth, erection of forms or structures, or similar activities at a development or project site.

**Disposal:** the discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste into or on any land, water so that it may enter the wider environment, including ground water sources.

**Dredging:** is an excavation activity or operation usually carried out at least partly underwater, in shallow seas or fresh water areas with the purpose of gathering up bottom

sediments and disposing of them at a different location, mostly to keep waterways navigable.

Effluent: water discharged from a development or a man made structure into receiving water body or the environment otherwise.

Euryhaline: pertaining to the ability of a marine organism to tolerate a wide range of salinity.

Eutrophication: elevation of nutrient content of water through input of fertilizers, fecal materials and domestic effluents

Fauna: animals.

Fecal: of or related to feces.

Flora: this involves the description or relation to all the plant life in or around the field of study.

Finfish: collective terms for aquatic vertebrates with scales which uses fins for propulsion.

Groundwater: water below the land surface in a zone of saturation.

Habitat: a place where a particular plant or animal lives: Generally refers to a smaller area than environment.

Intertidal Zone: lies between the high and low tide extremes and can be divided into a high tide zone which is mostly dry and covered by the highest high tide but not the lowest high tide, the middle tide zone exposed and covered equally by all high tides and exposed during all low tides, and the low tide zone which is mostly wet and covered during the highest low tides and exposed during the lowest low tides.

Lagoon: a body of water separated from the sea by a bank or coral reef: Also the region between a shore and a barrier reef or inside a ring of islands composing an atoll.

Lagoonal: Of or relating to lagoon

Littoral Zone: also known as the foreshore or intertidal zone, lies between the high and low tide extremes.

Microalgae: algae that project more than 1 cm above the substrate, such as *Dictyota* spp., and *Halimeda* spp.

Mangal: of or relating to mangroves

Mangroves: collective term used for range of salt-tolerated inter-tidal plants found throughout the tropics.

Neap Tide: tide of minimal range occurring when the moon in quadrature, or its 1st Quarter and 3rd Quarter Phases.

Nearshore Zone: the seaward zone from the shoreline to the line of breakers.

Pelagic Environment: the open ocean environment which is divided into a neretic province with water depths 0 to 200 m and the oceanic province with depths greater than 200 m.

Pelagic Organism: free-swimming or floating biota that live exclusively in the water column, not on the sea floor or ocean bottom.

Permitting Agency: a Government Agency responsible for issuing permits to allow various aspects of a development to proceed within the context of the Laws of Belize.

Permit: authorization, license, or equivalent control document issued by an Agency of the Government of Belize to implement various aspects of a development.

Pollutant: any dredged spoil, solid waste, incinerator residue, sewage, garbage, chemical waste, heat, industrial, domestic, municipal or agriculture waste discharged into the environment.

Primary Productivity: the amount of organic matter organisms synthesize from inorganic substances within a given volume of water or habitat in a unit of time.

Project Proponent: developer proposing a particular project.

Red List: Catalogue of Threatened Species compiled by IUCN.

Salinity: a measure of the quantity of dissolved solids in ocean water: it is expressed in part per thousand by weight after all carbonates have been converted to oxide, the bromide and iodide to chloride, and all the organic matter oxidized.

Sessile: attached to the bottom or to rocks, pilings, etc. and unable to move.

Sewage: any human body waste and the waste from toilets and other receptacles intended to receive or retain body wastes that are discharged into the environment.

Sand: particle size ranging from 1/16 to 2 mm: It pertains to particles that lie between silt and granules on the Wentworth Scale of grain size.

Sanitary Landfill Site: a facility at which municipal, industrial wastes and hazardous wastes are applied onto or incorporated into the soil surface.

Shore: the section of land seaward of the coast: This extends from the highest level of wave action during storms to the low water line.

Shoreline: the line marking the intersection of the water surface with the shore: It migrates up and down as the tide rises and falls.

Silt: a particle size ranging from 1/128 to 1/16 mm: It is intermediate between sand and clay.

Spring Tide: tide of maximum range occurring every fortnight and coincides with when the moon is new and full respectively.

Sport Fishing:, also called Recreational fishing is fishing for pleasure or competition. It can be contrasted with commercial fishing, which is fishing for profit, or subsistence fishing, which is fishing for survival

Sublittoral: seabed below the low tide mark.

Tide: periodic rise and fall of the ocean surface and connected bodies of water resulting from the unequal gravitational attraction of the moon and sun on different parts of the earth.

Tidal Range or Amplitude: the difference in height between consecutive high and low water: The comparison may also be a day, month or year.

Topography: the physical shape of the land surface.

Transect: a line or narrow belt used to survey the distribution of organisms or substrate across a given area.

Vertebrates: animals belonging to the Subphylum Chordata, also known as the Chordates that include those animals with a well-developed brain and a skeleton of bone or cartilage: Includes fishes, amphibians, reptiles, birds and mammals.

Wave: a disturbance that moves over or through a medium with a speed determined by the properties of the medium.

Wave Height: vertical distance between a crest and the preceding trough.

Wave Length: horizontal distance between two corresponding points on successive waves such as from crest to crest.

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## GLOSSARY OF ACRONYMS

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**BAS:** Belize Audubon Society.

**BWSL:** Belize Water Services Limited.

**BEL:** Belize Electricity Limited.

**BTL:** Belize Telecommunications Limited

**BSWMP:** Belize Solid Waste Management Program.

**BTB:** Belize Tourism Board

**CBA:** Central Building Authority

**CBWS:** Corozal Bay Wildlife Sanctuary

**CEQ:** Council of Environmental Quality.

**CITES:** Convention on the International Trade in Endangered Species of wild flora and fauna.

**CSO:** Central Statistical Office, *See SIB*

**CZMAI:** Coastal Zone Management Authority and Institute.

**DoE:** Department of the Environment.

**ECP:** Environmental Compliance Plan

**EIA:** Environmental Impact Assessment

**FOC:** Fiber Optic Cable

**GoB:** Government of Belize.

**GPS:** Global Positioning System.

**IMO:** International Marine Organization.

**IUCN:** International Union for the Conservation of Nature.

**MoH:** Ministry of Health

**MPA:** Marine Protected Areas.

**MSL:** Mean Sea Level.

**NEAC:** National Environmental Appraisal Committee.

**NEMO:** National Emergency Management Organization.

**NFS:** National Fire Service

**NGO:** Non-Government Organization.

**OFOC:** Overhead Fiber Optic Cable

**REA:** Rapid Environmental Assessment.

**RTE:** Rare Threatened or Endangered.

**SPBA:** San Pedro Business Association

**SIB:** Statistical Institute of Belize

**SPT:** Standard Penetration Test

**SFOC:** Submarine Fiber Optic Cable

**SWMA:** Solid Waste Management Authority

**TBFIM:** To Be Filled In later by Management

**TNCE:** Tunich Nah Consultants and Engineering

**TOR:** Terms of Reference.

**TSS:** Total Suspended Solids.

## PLACEMENT NOTES

The intended BTL project aims to develop a social oriented project in San Pedro. The endeavor will be accompanied by the trenching of approximately 27 kms of sea bed, and the installation of FOC from Maskall to San Pedro Town. This document is aimed at describing the proposed project, its setting and supporting services and its impact and mitigation measures that will be employed. The description of the project, its setting and supporting services and amenities are in the form of an expansive narrative ( Sections 1,2 and 3) with its impacts described in its outcome (Sections 4,5,6 and 7).

### *Narrative*

The location and background of the project are identified in an expansive narrative which consists of a description of the overall project, its immediate surroundings and the supporting services required for operation. These components are also supported by a number of annexes that in principle provide further details to the narration. The main narrative is further broken down into two subcomponents as summarized in the following:

- The main narrative begins with Section 1 with the description of the overall project and Section 2 which gives a picture of the physical environment of the project. These Sections an important component in any EIA as it allows the reader to get an understanding of the overall project development along with a description of the environmental setting in which the project will be located.
- The other component or Section 3 relates to the infrastructural supporting services that will be derived from the utilities and amenities components in order to make the project viable. Such support services include identifying the water and energy demands as well as the calculating the wastewater and solid waste production. In addition, other components in this narrative give a broad view of the infrastructural components that will be developed in conjunction with the site's carrying capacity.

### *Outcome*

Every action must have an equal and opposite reaction. The resulting outcomes of the project's development are captured in the potential impacts. These impacts can be measured in terms of its magnitude, scope and duration. Prior to these impacts, a set of development alternatives are provided to broaden the reader's perspective in employing alternative measures. These components are described in Sections 4 and 5 of the document and entail a detailed description of the development alternatives and potential impacts that could arise as a result of developing the intended project.

### *Management*

The mitigational measures to the potential impacts are manifested in the management aspect of the proposed project (Sections 6 and 7). Section 6 deals with the implementation of an environmental management system (EMS) plan to address the different environmental impacts, its mitigational measures and proposed monitoring plans. On the other hand, Section 7 of the EIA document accounts for the response mechanisms to the natural disasters. The term 'disaster' is loosely used in this section and is referred to as any incident, accident, or natural occurrence that could affect the operation of the project in whatever way.

### *Conclusion*

The overall document was prepared with the fundamental view of understanding the project, its development concept and anticipated impacts on the receiving environment (water, soil, air and social components). This EIA submission is supported by data collected in the field (physical, biological and social) as well as from references and citations from reliable sources. Care was taken in obtaining the necessary information to satisfy the project's TOR and the overall intentions of the developer which is to develop the land or project site in an environmentally sustainable manner.

## **EXECUTIVE SUMMARY**

### **1.1 Project Location**

The proposed Belize Telecommunications Limited (BTL) Submarine Fiber Optic Cable (SFOC) project is to be a low social improvement development that will run from Maskall to San Pedro Town in the Belize District. The overhead section of the cable will run from Maskall to the coast line off Bomba, and then underground and under the seabed from there to San Pedro Town. It will then be tied into an underground network that presently exists in San Pedro town.

Presently, Stage 1 of the project site is easily accessible by vehicles due to corridor and transmission lines that are presently in current use by Belize Electricity Limited (BEL). It is anticipated that the development will utilize these same poles to complete Stage 1 of the project.

### **1.2 Project Description**

It is envisioned that the intended project will enhance, and provide fast, safe and reliable telecommunications to San Pedro and tied into the National Network currently being developed by BTL. In addition, the installation of the SFOC to San Pedro will offer the residents, tourists and transients an easier and faster access to the World-wide Web and by virtue of the domino effect increase business and access to the virtual tranquility of La Isla Bonita. The site has been chosen carefully, and also will run in the same general direction as the already installed BEL submarine cable.

With this in mind, the proposed development will be carried out in three subsequent stages which include the running of the overhead section of the FOC from Maskall to the coast near Bomba (Stage 1). This will entail the placing of the FOC on the BEL transmission poles to the coast.

The trenching and laying of the SFOC from the coast to San Pedro (Stage 2) which will be done in two phases. The first phase is from the coast to approximately 19 km due E, where at this point the substrate to be trenched becomes harder, mostly bedrock. The first phase will be done utilizing a plough jetter that will work easier in sand, while the second phase, from there to San Pedro Town will be done utilizing an excavator that will be specially adapted for this purpose.

Stage 3 of the project is the shortest which will entail the splicing of the SFOC to the existing underground network that BTL presently has in San Pedro.

In addition, the SFOC will be protected at four different locations, namely both landing sites, where the main channel for the Sugar Barges cross and the channel used by the

cargo barges that supply San Pedro Town. The method of protection is by utilizing an articulated pipe that will be used as a covering of the SFOC as per Appendix IV.

### **1.3 Potential Impacts**

The environmental impacts arising from the project are mostly ecological with minor social implications. The aim of the project developer is to provide improve and upgrade the technology presently being utilized in San Pedro, and to join it to the National Network.

The project activities that are likely to give rise to some environmental impacts of note is the trenching process that will be as a result of burying the cable system, the noise generated by both stages (1 & 2), and the potential impact on boating activities.

#### **1.3.1 Land Clearing Process**

Due to the fact that Stage 1 will utilize existing infrastructure put in place by BEL, there will be no clearance of and vegetation to support the project. The same is the case at the landing in San Pedro, where the SFOC will come ashore on an existing road access and then into the underground network.

The only potential impacts relating to the Stage 1 activities are the noise and possible disturbance to the wild fauna in the area. The noise and dust will be minimal as it bypasses as much as possible the existing communities in the area. The project site intends to conserve the buffer zone as much as possible by utilizing the existing infrastructure. The project plans to take advantage of some of the bare or denuded areas presently on the landing sites.

#### **1.3.2 Trenching Requirements and Volume**

It is anticipated that the trenching of the channels will disturb an estimated 7,824.14 m<sup>3</sup> of material for both phases of Stage 2 (See Table 2.2). It must be noted that the material will not be taken out, but it is anticipated that much of the material will be resettle back into the open trench and provide the backfill for the SFOC.

Potential impacts related to this activity are varied and a number of measures will be implemented to mitigate the issue. The primary turbidity and sedimentation impacts arising as a consequence of the trenching activities scheduled to be undertaken in conjunction with the currently proposed project are high in scope. The secondary impacts have been assessed as 'moderate' considering the project site and limited trenching methods and associated protocols to be applied.

#### **1.3.3 Water, Wastewater, Solid Waste and Energy**

Most of the trenching will take place off a specially outfitted vessel and barge which is fully self sustainable. Thus, the issue of water, waste water, solid waste and energy will be addressed and supplied by the vessel. The only possible issue in energy is the supply

of fuel to the vessel, which is for the operation of the equipment, generator and the engines.

#### **1.3.4 Social Related Impacts**

The proposed BTL development is expected to be carried out in three subsequent and continuous phases that is anticipated to create long term benefits creating increases in economic employment and investment opportunities for Ambergris Caye and Belize on a whole. The proposed undertaking spin offs will result in increased visitation to the site, an increase in the temporary and full time labour force and economic stability.

#### **1.4 Conclusions**

The proposed development intends to provide fast, safe and reliable service to San Pedro by offering an upgraded technological system known as Fiber Optic Cable (FOC). It is the intention of the developer to not to negatively impact the natural wonders of the area for an ultimate visitor guest experience. Therefore the proposed development will carry out its construction phases with this aspect in mind and at the same time protecting the sensitive environment of the project site.