CHAPTER 4

4.0 DEVELOPMENT ALTERNATIVES

4.1 Introduction

In analyzing the environmental impacts, there are usually two or more alternatives to consider for each issue. The alternatives may encompass a wide range of consideration and can represent a choice between the construction and operation of a project and the non-development option.

With this in mind, the general principle involved in identifying the option(s) of the proposed project is to ensure that the option chosen would result in optimal social, economic and environmental returns. In effect the option chosen should corroborate well, not only for the developer, but also for the environment and stakeholders in the area.

4.2 The 'No Action Alternative'

The analyses of alternatives compared results in the selection of the preferred alternative for the project based on sound environmental, technical and economic grounds i.e., the option with the highest cost benefit factor, the most technically feasible and with least residual impact on the environment (social and biological) is identified as the preferred option.

The "No-action" alternative or non development option is usually discussed as an option in the EIA process. However, this alternative is difficult to consider as a viable option due to the pre-existing investments which have been incurred.

In some instances, certain companies make arrangements for certain purchases after project approval and the EIA process. However, there are circumstances when purchases have been conducted prior to the EIA preparation, thus the application of the EIA discussion of alternatives cannot include the options for alternative project location. However, in the case of this project, the corridor to be used for the project is partly in use by BEL, which is Stage 1, and the remainder is seabed, which according to Belize Law are Crown Lands. Applications to the relevant Government Departments have been made to facilitate the process.

The initial investments already incurred, coupled with the necessity to improve the service to the San Pedro population, and the completion of the National Network were the primary reasons for the no action alternative not to be found economically feasible. This option would result in the loss of investment capital, and the loss of economic opportunities such as employment generation, revenue and foreign exchange generation etc. However, the EIA as a planning tool, is considered critical for the determination of potential negative impacts, mitigation measures and as an important part of the process of identification of best technology for the project.

Beneficial results of non-development options cannot be ignored. These benefits include ecological and environmental preservation, and the reduction of stress to existing flora and faunal assemblages. One of the primary habitats that continue to be degraded and lose its ecological characteristics is the mangrove forests, which is an important vegetation type of the

coastal plains of Belize. Fortunately, this project will not require the clearance of any flora due to the fact that the project corridor for Stage 1 is the same in use presently by BEL. Mitigation measures therefore will not be of importance for Stage 1, but will definitely be a factor in Stage 2, which is the seabed and it does involve the disturbance of some sea-grass areas and other aquatic flora and fauna. Mitigation for this stage is by choosing the best possible route that bypasses any protected or economically utilized area and selectively identifying important plants within the zone of impact and ensuring their preservation.

4.3 Technical and Economic Analysis

For a project to be viable it must ensure that the development is technically, economically and financially feasible. Cost Benefit Analysis (CBA) of projects of this nature often compares the economic feasibility of all options. CBA is concerned with an analysis of cost and benefits for the economy as a whole. The objective is to know the difference between social benefits and social costs.

During the analysis, financiers also looked at the need to develop the project using the most practical technology bearing in mind the objective of maintaining as much as possible, the ecological integrity of the area and the habitats it supports.

Technical and economic feasibility is then weighted against environmental/ecological degradation. Consideration of technical and economic analysis included consideration for suitability of site, accessibility, and protection against natural disasters, installation costs, benefits, job creation and revenue generation.

4.4 Conceptual Strategy for Alternative Analysis

The alternatives for the proposed project are outlined in the rationale and the strategy approached of the particular alternative. This new approach is delineated by the different options that are available for discussion and the magnitude and scope of the related impact. The following sections summarize the different alternatives and their related impacts to the receiving environment.

4.4.1 Wastewater Treatment Alternatives

It is anticipated that the proposed development will take into consideration the possible wastewater treatment alternatives described in Table 4.1. As mentioned previously, the project will only produce minimal wastewater for the duration of the installation of the SFOC, which is being estimated at 3 weeks. The wastewater produced will be as a result of human use, i.e. bathroom, washing of dishes etc. The water used for the jetting will be the same seawater that will be pumped through the system. Based on this, the only alternative is to have the vessel store wastewater water in its tanks.

4.4.2 Disposal of Treated Wastewater

It is inevitable that wastewater will be generated as a result of all the stages of the installation of the FOC. In considering the magnitude and scope of the proposed project, only two disposal alternatives were discussed. The options considered are summarized in the following:

Table 4.1 Evaluation of Treated Wastewater Disposal

Option	Rationale	Strategy	Impacts
1.0 The emptying of the vessels holding tanks at a certified marina.	Marinas are equipped to handle this type of waste water.	Hooking up to the suction pump lines at a marina and emptying the waste water.	The wastewater will be incorporated into the BWSL system
2.0 Emptying of the wastewater at high seas if the vessel is from abroad	It is an environmentally accepted practice utilized by vessels at high sea	The emptying of both wastewater and bilge water by pumping out.	Due to the amount of the wastewater and the vast expanse of the high seas and the waves and currents, rapid dilution will occur

4.4.3 Solid Waste Disposal Alternatives

In discussing the alternative analysis for the project's solid waste disposal methods, it was considered that there was only one feasible disposal option. This approach is important in considering that this action would eliminate the dependency of having a complicated disposal method for such minimal solid waste. Considering the nature of the operation, location of the project and nature of the receiving environment, the best alternative is to bag the garbage and either send it to shore on a daily basis or at the end of the project collect the garbage stored on-board the vessel and dispose at a certified dumpsite, either in Belize City or San Pedro. The latter would be preferable noting that the quantity of waste material will be minimal. In any event, the alternative options are always important in analyzing the true 'benefits' of employing the primary or chosen option.

4.4.4 Energy Generation Alternatives

Development alternatives are an important concept in any environmental impact assessment. As part of the alternative analysis for energy generation, the proposed project will explore its only available alternate source of energy that will suffice or supplement the energy demand. The use of diesel generators installed on board the vessel, which will provide power for the vessel, its instruments and the jetter for the plough. The following section summarizes the source description along with their respective impacts.

Table 4.2 Alternative Analysis for Energy Requirements (SFOC Stage)

Option	Rationale	Strategy	Impacts
1.0 Diesel Generators	In view of a continuous energy supply over an extended period of time, the primary use of diesel generators attached to the engine block of the vessel as its single source of producing electrical energy for the proposed project. This option was chosen due to the fact that the operations will be carried out from a vessel.	The contractor will therefore utilize the diesel generators attached to the engine block to produce and supplement the energy demand.	Generators tend to create excessive noise pollution as a result of their operational process. Pollution risk due to accidental spill from fuel and oil storage tanks can also occur. In addition, air pollution and combustion fumes can pose serious health risk to the humans and contaminate the air over prolonged operation.

4.4.5 Cable Burial Process

The project will require certain activities for the FOC burial process that will ensure the integrity and safety of the FOC. In considering the alternatives for these activities, the following table summarizes the activities that will be utilized for burial of the FOC.

Table 4.3 Project Activities

Option	Rationale	Strategy	Impacts
1.0 Locate straightest line from the transmission poles near Bomba to the manhole in the area of San Pablo, Ambergris Caye, avoiding protected areas, and ensuring that highly trafficable areas are not put in jeopardy due to either the installation process or the possible exposure of the cable in the future.	To ensure that the environmental integrity of the sea-bed is maintained as much as possible, and that no disturbance to any protected area is caused by the operational activities.	Use of a jetting plough machine along with an excavator installed on a barge to bury the cable in the sea floor.	Primary need is to ensure the integrity of the SFOC. Anticipated impacts would require successful mitigation measures to be in place as described in Chapter 6.3.1.

4.5 Conclusion

In accessing the comparative evaluation of the different project alternatives presented for the proposed project, the proponents plan to exercise these alternatives as seen fit. This of course, will fall within the scope of the overall environmental performance of the chosen ‘alternative’ and its associated impacts to the receiving environment.

In any event, it is necessary to layout the different options that are available in order to safe guard the environment and its interconnected elements. In considering the different project alternatives presented, the comparative process stems from both the rationale and strategy approach that was devised to discuss the alternative. Therefore, it is in the best interest of the governing body to ‘compare and evaluate’ the options described.