CHAPTER 16

ALTERNATIVES FOR DEVELOPMENT

16.1 Introduction

In analyzing the environmental impact, there are usually two or more development alternatives to consider. The alternatives to be addressed may encompass a wide range of considerations and can represent a choice between the construction and operation against the non development option. The primary alternatives for development are itemized in Table 16.1 and the unavoidable impacts of the proposed development options are also itemized in the same table.

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

16.2 The 'No Action Alternative'

The analyses of alternatives compared results in the selection of the preferred alternative for development based on environmental, technical and economic grounds i.e., the option with the highest cost benefit factor, the most technically feasible and with least residual impact 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 by the developers. One of the most costly investments that are normally incurred prior to project approval is land purchase.

In some instances, certain companies make arrangements for land purchase after project approval, after the EIA process. However, there are circumstances when land 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, as is the case of the Palm Harbour project.

The initial investments already incurred were the primary reason 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.

However, 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. Mitigation measures addressed elsewhere, call for the clearing of this vegetation by selectively identifying important plants within the zone of impact and ensuring their preservation.

The government is under pressure to improve the standard of living of the people. To this end tourism development has been earmarked as one of the most promising avenues to growth. As always the more relevant issue is how to steer this growth in a sustainable direction so that it will do the most good for all the local and national stakeholders. The question then becomes whether the approach to the project is sustainable socially, economically and environmentally and if not how could it fulfill these higher principles.

16.3 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, investigators also looked at the need to develop the site 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 was then weighted against environmental /ecological degradation. Consideration of technical and economic analysis included consideration for property value (parcel size), suitability of site, accessibility, and protection against natural disasters, construction costs, recreational benefits, job creation and revenue generation.

16.4 Conceptual Strategy

The Alternatives to Development outlined in regards to the currently proposed Palm Harbour Development project is based on an articulation of those options, where they exist, to demonstrate the second and third options that may be adopted in the best interest of the project and the integrity of the environment. The options articulated are inherently hierarchal in nature, with Option #1 being the option to be followed in the proposal, and Option #2 being the second most favorable course of action, and Option #3 being the least preferred alternative.

A brief summary of the various conceptual strategy options to development are outlined in Table 16.1 below:

Table 16.1: Summary of Development Alternatives

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Development Concept			
	Marina Center + Residential Development*: Consistent with the overall development plan for the Hughes Estate area. Residential area will be a trademark of subsequent development of this sort. Marina and its associated components will address the demands of the residential and visiting population.*	Marina + Residential Development: *Limited development services would affect capability to generate additional capital necessary for project development, environmental implementation and project maintenance. Passive recreation would interest some retirees but would exclude the major retirement market and boating enthusiasts.*	Non Development Option: *Loss of US$ 15-25 million in investment and foreign exchange. In addition loss of possible employment opportunities especially in the construction sector. Moreover, possible land use potential would degrade over time thereby limiting any other proposed activity.*
Siting Rationale			
Siting of the Overall Subdivision Development	General Siting: *Location of the subdivision component is characteristic of a low density development of 0.5 acre per lot. Siting of other required services is consistent with the area's potential development and competitive status. Viable opportunities are offered in the form of the different neighboring projects.*	Other: *Locations other than the proposed site would have negative environmental impacts.... Also the declared interest of the proponent is to pursue the development of the project in the ambience that it has been submitted at the proposed location, given the natural assets of the area.*	Status Quo*: This option would not serve the interest of the proponent or indeed the retirement industry… Moreover the losses that accompany such potential investments.*

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of the Residential Component	Subdivision Lots and infrastructure: *The number of proposed residential lots would impair the proposed design concepts. Moreover, the residential component is based on a low density subdivision development which is ideal considering the nature of the intended market and resource availability.*	Subdivision –High Density: *Design concepts would not prove viable considering the intended market. Investment returns would be less considering investment capital and other available resources, Moreover, environmental impact would magnify thereby shortening the project life span.*	Non-Development Option: *Other development concepts would not prove fruitful considering the neighboring projects.*
Placement of the Canal Frontage	Canal Access: *Envisioned to increase the subdivision marketability to the retirement population. Enhances the provisional sale compared to neighboring projects. Environmental factors would have to be weighed into consideration.*	Other: *Limited network of canal would not serve the intended purpose, and would impact the site's attractiveness.*	Non-Development Option: *Increased density of project site multiplying the associated environmental impacts. Site would be less 'attractive' to prospective buyers.*
Siting of Marina Piers	Lagoon Marina: *Location based on developmental plan, environmental conditions are favorable for development. Economically feasible and viable considering the recreational potential of the area and surrounding environments.*	Substitute: *Downscaling proposed marina concept would impact project profitability and would impact investment return.*	No-Development Option: *A major demand for marinas with growth in sea-based tourism in Belize – Absence of marina would erode viability and integrated scope of proposed development.*

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of the Marina Commercial Center	Southeastern End of Project: *Area chosen not among prime recreational or developmental location of the project. Marina would be better sourced for services and supplies required by the development.*	Substitute: *Alternative area would interfere with subdivision plans and traffic projected for the subdivision. Provisional uses would not suffice residential demands.*	Non-Development Option: *Impact severely the marina services being demanded by the project residents. Would erode the feasibility of the project on the long run and the services would not cater to the resident population.*
Siting of Utility Zone	Planned Siting western end of Project: *Location adequate considering development concept and in establishing the Utility Zone as far away from the development but as close as possible to the shrimp farm for accessibility with supplies and services to the project.*	Alternative: *Expensive venture considering servicing and accessibility. Placement in subdivision not considered adequate and would cause numerous environmental impacts.*	No-Development Option: *Project requires a utility zone, project would still remain viable but with increased environmental impact to the development and to the receiving environment. Besides, no service would make the project untenable,*
Subdivision Road Access	Proposed Road Access: *Placement of road system would facilitate the development of the project site; moreover it would facilitate an easier access for residents, services and supplies to reach the project site. Road options would also follow the least impacted routes.*	Alternative: *Same as Option 1 and necessary for any project development. Options offer viable alternatives to transport materials.*	Non-Development Option: *Development would not prove viable without this basic infrastructure. Loss of potential investment. Project development is based on an access road.*

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of Dredging Spoils	Reclamation of development lands: *This process would elevate the landscape and increase the project profitability. Filling would alleviate low lying flooding problems. In addition, spoils produce would serve a purpose rather than to cause unwanted environmental impacts if not utilized.*	Alternative: *Placement of spoils other than intended site would not be beneficial to the development and would cause unwanted environmental impacts associated with this kind of activity.*	Non-Development Option: *Reclamation is required due to low lying areas being constantly flooded. This practice would better protect the development from associated natural hazard (flooding, & erosion). If not considered, development might be faced with viability problems.*
Siting of the Fuel Storage Tanks at Proposed Locations	Proposed siting in the Utility Zone: *Proposed location is adequate considering the potential environmental impacts. Moreover, the siting and placement would pose less risk to the residents and visiting population.*	Alternate Siting: *Placement is considered inadequate and can pose serious health and safety hazards to residents. Response to potential accidents would take precious time.*	Non-Development Option: *Project is dependent of fuel. Important factor in the development and operational process of the development… Marina services would be impacted.*
Siting of Waste Incinerator	Proposed siting on the southwestern portion of the property: *Location is adequate and far away from the project site and away from any development whatsoever.*	Alternative Placement: *Siting of incinerator in the Utility Zone is adequate but can pose both safety and health hazards to the project site and staff.*	Non-Development Option: The use of this equipment is justified by the fact that the project intends to provide solid waste services to the international vessels.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Dredging Activities			
Marina Dredging	Dredging to allow access for marina berthing: *Docking of residential and visiting population is part of the financial scheme to attract potential investment. Berthing of vessels will not impact the neighboring projects as well as the lagoon system.*	Dredging small marina: *Limited opportunity for residential vessel docking. Loss of potential revenue in terms of marina serves.*	Non-Development Option: *Loss of potential revenue in marina services. Project is dependent of the use of the marina. Loss of employment opportunities.*
Marina Canal	Allow Access to Marina: P*otential accommodation of larger vessel to dock and utilize the marina services. Potential revenue in marina services…. Allow other vessels to capitalize on neighboring projects.*	Dredging small canal: *Loss of potential revenue, and inability to provide intended services and docking.*	Non-development Option: *This is the default position that would result in non-action…This would not be of benefit to the developer or residents of the project.*
Canal and Marina Sea Defenses	Concrete and sheet pile protection: *This formation poses less environmental impact …. This formation would prevent wake erosions while inside canal network. Possible combination with composite bulkhead that would resist corrosion and retain both the marine and land environments.*	Other Marina Defenses: *Material may be prone to 'washed out' and fracture as a result of constant wave action, movement of soil and sediment.*	Non-development option: *Construction of canal and marina defense is imperative, it is necessary for development…project would not prove viable….would not appeal to visitors to the site*
Utility Infrastructure			
Water Supply	Well water: *Use of available resources and with potential expansion regime.*	Secondary Option: 100 % *Rainwater harvesting would not suffice the project at full development*	Non-Development Option: *Project is dependent on a good water quality source in order to operate.*

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Sewage/Wastewater	Installation of Package Treatment Plant: *This entails 'secondary' level treatment of sewage and the recycling of effluents to flush toilets and irrigate lawns and hedge rows - Option is least deleterious on the environment, not only in terms of direct ecological impact, but also because it significantly reduces water demand, which is a scarce commodity on the cayes in general.*	Septic Tank System: *presence of saline influences greatly constrains functionality of 'soak away' to reduce nutrients and fecal pathogens…Also possibility of leaching of effluents into sea which is a threat to both human health as well as to the environment from eutrophic or nutrient enrichment influences.*	Non-Development Option: *A development of this nature cannot operate without an effective sewage/wastewater collection and treatment facility.*
Energy Generation	Primary Source: *Most viable option considering project location. Possible future connection considering potential area development. Good source of continuous energy supply.*	*BEL: Expensive venture with high capital investment. Possible future connection planned when area develops further and the infrastructure becomes available.*	Non-Development Option: *This option is untenable since the project cannot operate without energy generation especially considering project location*
Solid Waste	*Chosen Option:* Most environmentally sound option given project location , type of investment and residents	Burning and Burial of Wastes: Not recommended considering the nature of the development and proposed activities.	Non-Development Option: Untenable considering the nature of the other developer's project.

16.5 Conclusions

Based on the conceptual strategy approach, the goal of the project proponent was to describe the facts and rationale by which the 'rejected options' were deemed infeasible.

This is not to say that the ‘No Alternative’ option should be ignored. As a matter of fact, this Chapter presents a discussion of alternatives that should be used to inform the public decision-makers of the various environmental impacts associated with each alternative. This information will allow the decision-makers to formulate a reasoned judgment on each alternative to determine which are the environmentally superior choices.