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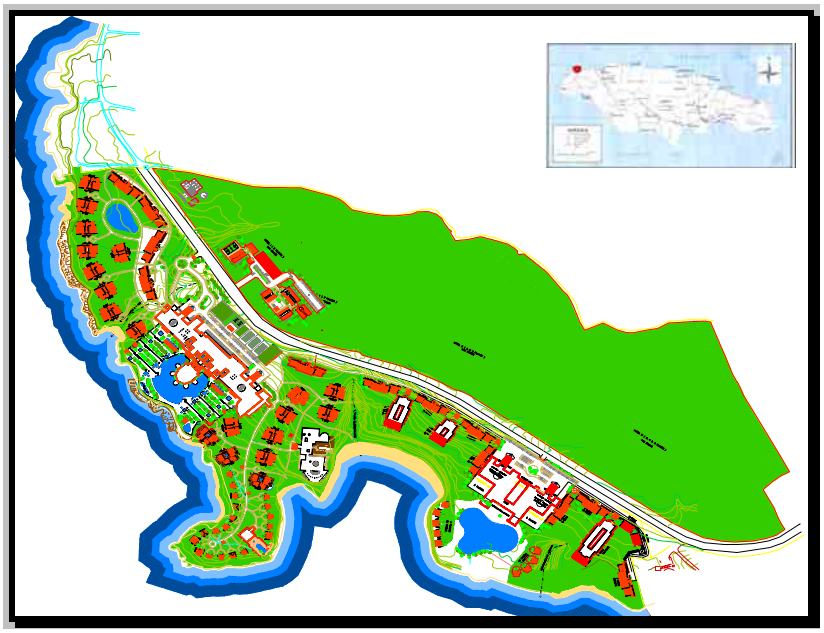
ENVIRONMENTAL IMPACT ASSESSMENT



FOR

GRAND PALLADIUM LADY HAMILTON RESORT & SPA AT POINT, HANOVER

For:

Fiesta Hotel Group

December 2005

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INTRODUCTION

FIESTA Jamaica Limited proposes to construct a 2000 room hotel on 80.9 hectares (200 acres) of land located at Point, Hanover. An Environmental Impact Assessment (EIA) of the project was conducted by Environmental Science and Technology Limited (ESTECH), to provide a complete description of the existing site, detail the elements of the development, identify major environmental issues, and report on public perception.

The EIA seeks to identify those activities of the project, which could have an adverse effect on the environment, and to determine means of avoiding the adverse consequences identified as well as to identify the positive or beneficial impacts.

This project includes benefits such as employment opportunities, foreign exchange earnings, increased property values and benefits to ancillary supporters/dependents of the tourism industry. In fact, the total investment is estimated at upwards of US$60,000,000. If approved, construction at the facility is scheduled to last approximately 18 months, and is likely to provide employment for an average of forty (40) individuals during pre-construction, eight hundred (800) tradesmen and labourers during construction, which at its peak will increase to approximately twelve hundred (1200) workers and approximately eight hundred (1000) employees during the operational phase. Additionally, the multiplier effects to the construction and support industries during this period are likely to affect a much larger number of persons.

LOCATION AND LAYOUT

The study area is split by the North Coast Highway and extends approximately 2.5km (~1.5mi) from Elgin Town (at the Molasses Factory), which is east of Lucea (Figure 1-1). The proposed development will consist of two stages of 1000 rooms, each with such facilities as restaurants, shops, bar, pool, spas, recreational areas, support facilities, and a sewage treatment plant.

A sewage treatment system designed to treat wastewater to the tertiary level using an activated sludge process is proposed for the development. This sewage treatment system is designed to produce an effluent that will be suitable for irrigation purposes in keeping with NEPA's irrigation standards. The system will be designed to a volumetric capacity of 82, 800 m^3/month, which is inclusive of the 15% contingency required by NEPA, more capacity than will be generated by the facility at maximum occupancy. Wastewater will be collected at various pump stations throughout the facility, pumped to a principal septic tank then to the main collection tank for settling. The liquid portion is then transferred to large oxidation tanks where air is injected. When the bacterial process is completed, the liquid is passed through decanters (secondary settling tanks) where the solids and liquids are further separated; the liquid is filtered and chlorinated prior to going to the irrigation vault, while the solids are re-entrained into the front of the process.

The project is expected to consume approximately 72,000 m^3/month of water during maximum occupancy of the development.

The hotel is also estimated to use approximately 4, 875, 000 kW/month during operation, which will be supplied from the Jamaica Public Service Company (JPS Co.) service lines. This represents a 7000 KW demand.

ALTERNATIVES

Four alternatives to the development have been identified. These are:

- The No Action alternative

This alternative would see the cessation of project plans and the site retained in its present state, and is not a favoured action by the developers or community.

The "No Action" Alternative is likely to have the greatest implications on the socio-economic environment. This action would result in the loss of a major direct and indirect employment generating activity and foreign exchange revenue. For example;

- The project entails an investment of upwards of US$60, 000, 000
- There are at least 1000 potential jobs at stake during operation
- There is significant spin-off potential in direct socio-economic benefits

The potential use of the site by squatters and for dumping of solid waste would aid in the degradation of the site and the community. If this alternative were adopted, the developers would need to find an alternative site for the development in Jamaica or elsewhere.

- The Proposed Development

This alternative would see the construction of the hotel as proposed by the developers. It would provide positive benefits such as employment for approximately 800 persons during construction and approximately 1000 who live in the wider community during operation. Additionally, the multiplier effect of this type of development would result in noticeable economic benefits for the parish of Hanover and the region. The proposed project will also make a positive contribution to social infrastructure, overall residential development, upkeep and renewal of the residential community. At this time there is strong support for this development from the residents of the area (based on results of a socio-economic survey).

This is the preferred alternative and is supported by the community.

- The Proposed Development with Modifications

Residents do have some concerns about sewage treatment, building heights and density with this project and want to see the project developed within the rules and regulations with minimal impact on the environment and the aesthetics of the community.

There is a recognized need for communication between the developers and residents of the surrounding communities. Through community meetings, any issues that arise will be resolved.

- The Proposed Development in Another Location

Other locations were considered in conjunction with the proposed Point location for implementation of this project. However, the Point property offered the following advantages over other locations considered:

- Size of available land was desirable
- Beach and waterfront location was ideal with beautiful white sand beach in two protected natural coves, and high quality marine environment
- Size of property allowed for inclusion of a tertiary level sewage treatment system with capability to treat to a level satisfactory for use as irrigation water
- Available infrastructure:
    - Modern highway in proximity to a major international airport, Sangster International Airport in Montego Bay
    - Water supply (Great River/Lucea water supply)
    - Electricity
    - Communications

POLICY, LEGISLATIONS, REGULATIONS & STANDARDS

National Environmental Planning Agency (NEPA), the governing environmental agency, requires an environmental impact assessment (EIA) to be conducted for review along with the requisite development plans. The Environmental Control Division (ECD) of the Ministry of Health imposes guidelines for air, water and soil standards to be maintained after construction.

Legislations relevant to the establishment of a hotel development in Hanover are:

- The Natural Resources Conservation Authority (NRCA) Act, 1991
- The Wildlife Protection Act (1945)
- The Beach Control Act (1956)
- The Public Health Act (1974))
- Jamaica National Heritage Trust Act (1985)
- Town & Country Planning Act (1987)

ENVIRONMENTAL & SOCIAL BASELINE

The parish of Hanover receives an average of 127-178cm of rainfall per year and has two distinct rainy periods, between the months of May and June and from October to

November. Temperatures range from 21 ^{0}C to 32 ^{0}C during the hottest months and 18 °C to 28 °C during the colder months. Hurricanes are a serious seasonal threat from July to November. The site is not in a major earthquake zone, as only three earthquake events of intensity greater than six on the modified Mercalli scale have been reported in the area between 1897 and 1978.

The shoreline soil is a part of the Hanover Shale Formation, and consists of an extensive outcrop of interbedded shales and sandstones. Structures built on slopes greater than 1:4 may be at risk. The soft, rubbly nature of the shale increases the risk of erosion during earth moving activities.

The vegetation communities on the site are a remnant of the original vegetation, and only contain a portion of the species usually found in typically coastal communities. The beach pioneer species included *Laguncularia racemosa* (White mangrove), *Coccoloba uvifera* (Sea grape), *Ipomea* sp. and *B. maritima* (Salt wort). The majority of the vegetation of the site consisted of mature tree species, typically coastal, which are adapted to hot, salty conditions. The dominant plants were *Acacia tortuosa* (Wild Poponox) and Seaside Mahoe (*Thespesia populnea*). Approximately sixty-two (62) plant species were recorded, none of which are endemic, rare, threatened or endangered.

Twelve (12) bird species were observed on the site, three (3) of which, the Sad Flycatcher, Jamaican Crow and Jamaican Blackbird, are endemic. In addition, burrows belonging to the species *Cardisoma guanhumi* (Great land crabs) were observed on the site.

An assessment of the marine communities in the area was done at 5 locations. At all locations, the reef communities showed signs of vitality and appear to be improving from past stresses and degradation. A wide variety of fish species were present at the locations.

The findings of the water quality sampling, indicated that water in the coastal waters at the time of sampling were in excellent condition. These results are promising, as the condition of the reefs appears to reflect the water condition recorded in the area. The type of sewage treatment system proposed for this development will not impact negatively on coastal waters, since there is no direct discharge to the environment.

The project area, Point, is adjacent a thriving Town, Lucea, the capital of the Parish. The parish has a calculated population of 66 602[1]. The parish capital, Lucea (estimated population of 12,129 in 2001, in a 7km radius including Point[2]) is west of the project area, and the town of Negril, the second largest tourism centre (estimated population of over 4,000 in 1999), is further east of the project area.

Residents in the community are in favour of the development being constructed. They cite issues ranging from need for employment to economic development of the area as reasons for the support.

POTENTIAL IMPACTS & MITIGATION

No major impacts on the environment were identified in the proposed development. The removal of vegetation and ecological habitats is unavoidable and is the main trade-off to be made against the economic benefits to be derived from project implementation. However, careful planning can ensure protection of some mature standing trees, and by extension, any endemic terrestrial fauna. Issues related to dust management will be addressed in the monitoring plan for construction and should not be a major issue.

An environmental impact matrix is a simple tool for identifying the possible impacts, whether positive or negative, of human activities on the environment. The activities carried out during the various phases of the hotel development are considered in the matrix with respect to the environmental factors that are deemed relevant to the specific site, or which may be affected indirectly as a result of project activities. The impact mitigation matrix highlights those activities needed to remove or ameliorate the identified significant adverse impacts and to enhance the positive aspects of the development.

The construction of buildings, ancillary facilities, parking areas etc., will permanently cover the soil surface, rendering these areas impermeable to infiltration of water in the soil, and increasing surface runoff. This runoff will be properly managed and channelled into soak-away pits (French drains) to lessen the impact of storm water on the marine environment.

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[1] World Gazetteer: *Jamaica: Administrative Divisions (population and area)* http://www.world-gazetteer.com/r/r_jm.htm, Accessed December 2005

[2] Falling Rain Genomics, Inc. 1996-2004 http://www.fallingrain.com/world/JM/2/Lucea.html, Accessed December 2005

TABLE 0-1: POTENTIAL IMPACTS & PROPOSED MITIGATION STEPS

Potential Impact	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Removal of Vegetation, Loss of Habitat	Pre-Construction [Site Clearance]	Land, Flora, Fauna, Endemic Species	Medium & Immediate/Long-term	Direct/Minor Negative / Reversible impact	Included in cost of construction
Mitigation Measures: The removal of vegetation and ecological habitats is unavoidable and is the main trade-off to be made against the economic benefits to be derived from project implementation. By design many mature trees will be left intact, and by extension, any endemic terrestrial fauna. Species re-introduction should occur naturally in these areas.					
Activity	**Action**	**Environmental Receptor**	**Magnitude & Duration**	**Significance**	**Economic Value**
Aesthetics	Construction [Zinc Fencing around Project Area]	Humans (Nearby Residential Communities)	Minor & Approx. 18 months	Minor Negative/Indirect/ Sporadic/Unavoidable Impact	Minimal cost if existing fence is maintained
Mitigation Measures: Maintenance and Upkeep. Construction Monitoring. Communication with Residents/Resorts. Speedy Removal.					

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Noise, Fugitive Dust, Air Pollution	Pre-Construction & Construction [Vehicular Traffic (Trucks/Heavy Equipment), Soil Stockpiles, Construction Activities]	Humans (Residential and Resort Communities)	Medium & Occasional (Approx. 18 months)	Minor Negative/ indirect/Sporadic/ Avoidable Impact	External monitoring
Mitigation Measures: Appropriate scheduling of activities. Construction Monitoring. Dust Suppression through sprinkling. Proper Servicing of Equipment. Quick Response. Communication With Residents/Resorts. Covered vehicles on public roads Flag men will be utilized to manage traffic flow in and out of the site					
Activity	**Action**	**Environmental Receptor**	**Magnitude & Duration**	**Significance**	**Economic Value**
Storm water, Erosion, Sedimentation, Silting, Run-Off to Sea	Pre-Construction & Construction [Site Clearance, Vegetation Removal, Excavation]	Marine/Coastal Zone	Medium & Occasional/Long Term (through occupational phase)	Minor Negative/Indirect/ Sporadic/Avoidable Impact	Should not exceed JA$1.0 Million
Mitigation Measures: Careful Phasing of Activities With Consideration of Rainy Seasons. Construction Monitoring. Implementation of Control Devices (Drainage, Silt Fencing, Soak-away, etc.)					

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Flooding Potential, Drainage Patterns, Storm Surge, High Water Table.	Construction & Operation [Incidental Rainfall, Hurricane, Excavation, Soak Away]	Groundwater, Coastal Waters, Project Area	Medium & Occasion/Long-term	Minor Negative/Indirect/ Occasional/Avoidable Impact	Included in construction cost
Mitigation Measures: Site designed to withstand 10-year return rainfall event. Construction Monitoring. Maintain design elevations. Maintain site drainage mechanisms. Not a typical problem in the area.					
Activity	**Action**	**Environmental Receptor**	**Magnitude & Duration**	**Significance**	**Economic Value**
Sewage and Wastewater (Effluent/Odour)	Construction & Operation [Sewage Treatment System, Temporary Sewage Handling during Construction]	Coastal Waters, Groundwater, Human	Minor & Long-term	Minor Negative, indirect, avoidable impact	Septic Hauler during construction period (included contract)
Mitigation Measures: Operate and Maintain facility in keeping with designs. Quick Response to issues. Implement contingency plans as needed (Septic Hauler, etc.). System has no direct discharge to the environment. Treated effluent goes to irrigation. Utilize licensed temporary sewage system provider for Portable Toilets and associated disposal.					

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Socio-Economic/Cultural/Loss of Traditional Use and Access to Beach	Pre-Construction, Construction & Operation [Entire Development]	Human	Large & Long-term	Minor Negative/direct impact	Not Quantifiable
Mitigation Measures: Positive socio-economic impacts. Provide public access if possible or prudent to beaches. Identify optional public resources in proximity for bathing, fishing, etc. Recognize Prescriptive Rights of population to utilize beach. Secure any identified cultural heritage resources through JNHT.					
Activity	**Action**	**Environmental Receptor**	**Magnitude & Duration**	**Significance**	**Economic Value**
Solid Waste Handling and Disposal	Pre-Construction, Construction & Operation [Vegetation Removal/Construction Activities/Packaging]	Coastal Waters, Land, Groundwater, Humans, Aesthetic	Minor & Occasional/Long-term	Minor negative, direct, avoidable impact	Included in cost of construction
Mitigation Measures: Minimize and reduce quantities of solid waste generated during site preparation and construction. A waste management plan should be prepared and followed. If practical, branches and leaves can be put through a wood chipper to make soil cover for garden beds, etc. Solid Waste not utilized on site should be disposed of in an approved landfill by approved haulers. An approved waste removal service should be contracted to remove waste produced on site.					

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Noise, leaks, exhaust from construction implements (batching plants, heavy equipment), petrol/oil/lubricant storage	Pre & Post Construction, Operation	Soils, Groundwater, Coastal Waters, Air, Humans	Medium & Long-term	Minor negative, direct, sporadic, avoidable impact	Equipment Maintenance included in contractors scope

Mitigation Measures:

Equipment and chemical storage will be monitored and maintained on a regular basis. Any indication of leaks, discharge to the ground will be addressed immediately. Equipment maintenance on site will be minimal and monitored. Construction monitoring will include these potential impacts.

Chemicals and fuels with a potential to leak, will be stored in secured, impermeable areas to reduce the likelihood of contamination (e.g. the diesel fuel tank proposed for the facility, will be housed in a reinforced concrete vault and properly sealed).

TABLE 0-2: POTENTIAL IMPACTS & PROPOSED MITIGATION STEPS CONT.

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Beach Aesthetics	Construction [Vegetation Removal/Construction Activities/Coastline Modification]	Soils, Groundwater, Coastal Waters and Marine Flora & Fauna therein,	Medium & Short-term	Minor negative, direct, sporadic, avoidable impact	Included in cost of construction

Mitigation Measures:

Requires excavation of sea grass and coarse material (gravel etc.) and the introduction of higher quality sand (finely graded, possibly from offshore). Silt screens will be used to contain sedimentation during beach filling exercises. Sea grasses removed may be transplanted at a suitable location along the coast.

Equipment and chemical storage will be monitored and maintained on a regular basis. Any indication of leaks, discharge to coastal waters will be addressed immediately. Equipment maintenance on site will be minimal and monitored. Construction monitoring will include these potential impacts.

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
The increase in traffic (buses, cars, staff vehicles etc.) noise levels, gaseous emissions	Construction & Operation of Facility	Human	Minor & Occasional over Long-Term	Minor negative, direct, occasional, avoidable impact	No major cost associated

Mitigation Measures:

The increase in traffic, while a notable impact, is not anticipated to be significant due to planned improvements to the local roadways (Highway 2000) and the overall development of the area as a tourist resort area. If the facility owns vehicles, they will insure that they are properly maintained at all times. Offending contract vehicles will be prohibited from the property.

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Utilities Shortfall (Potable Water Supply and Electricity Shortfall)	Operation of Facility	Human (Community and General Area)	Medium & Unsure	Minor negative, direct, avoidable impact	NWC & JPS Co. responsibility

Mitigation Measures:

Work with NWC and JPS Co. to develop independent/reliable source of each utility for the resort. Initiate water and energy conservation and minimization. Utilize treated wastewater for irrigation.

Activity	Action	Environmental Receptor	Magnitude & Duration	Significance	Economic Value
Solid Waste Management	Operation of Facility	Land, Soils, Air, Human, Coastal Waters	Minor & Occasional	Minor indirect, occasional, avoidable impact	Included in waste haulers contract

Mitigation Measures:

It is in the best interest of the facility to maintain high quality waste management and disposal practices. Garbage skips/dumpsters will be strategically placed throughout the site and emptied as needed by a contract solid waste company for disposal at an approved landfill.

MONITORING PLAN

The monitoring plan devised for the development should be implemented at the pre-construction, construction and operational phases of the project. Monitoring should involve the assessment of activities to ensure adherence to the recommendations made to reduce negative impacts. This should include monitoring for noise, dust, erosion and storm water management.

CONCLUSION

This development is supported by the community. The developers are willing to work with the regulatory agencies and community to insure that the development is pleasing and acceptable to all involved. Additionally, this development will have no major negative environmental impact and will result in several major positive socio-economic impacts on the surrounding communities and country as a whole. It is our recommendation that this project be approved for development and a permit granted.