

Environmental Impact Assessment

Addendum No 3



APPENDICES 26-28 NEPA COMMENT AND RESPONSE NEGRIL PENINSULA RESORT WEDDERBURNS, WEST END, NEGRIL, WESTMORELAND.

Prepared by: Negril Peninsula Resorts Ltd

12th July 2007

APPENDIX 26

RESPONSE TO NEPA COMMENTS

INTRODUCTION

This document addresses the comments made by the National Environment & Planning Agency received by e-mail dated 4 July 2007 following the review by the relevant technical agencies of the Environmental Impact Assessment report and its Addendum's on the proposed Eco-Tourism Resort Development of Negril Peninsula Resorts Ltd. at Wedderburns, West End, Negril, in the Parish of Westmoreland.

NEPA's comments are presented in Black (Times New Roman) the response is presented in Blue (Arial). Numbering has been added for clarity and ease of reference.

COMMENTS ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA)
FOR THE WEDDERBURN DEVELOPMENT, NEGRIL WEST END,
WESTMORELAND BY NEGRIL PENINSULA RESORTS LTD

GENERAL COMMENTS

1) The Environmental Impact Assessment (EIA) Report outlines fairly comprehensively, a study of the potential impacts this project could have on its natural environment and the surrounding community, in accordance with the approved Terms of Reference (TORs). Certain shortcomings of the study are outlined in the comments below.

1) Thank you for confirming the EIA is in accordance with the approved TOR, please find set out below answers to the additional comments you have raised.

2) The proponent is required to submit to the National Environment and Planning Agency (NEPA) and the National Works Agency (NWA) a comprehensive Surface Drainage/Storm Water Plan with the detailed building application for review.

2) Although preliminary storm water engineering drawings and a report are contained within the EIA clearly showing the site is capable of satisfactorily draining by gravity it is accepted that, the Proponent will submit a comprehensive

Surface Drainage/Storm Water Plan with the detailed building application for review.

3) Additionally, it is recommended that an archaeological watching brief be conducted during the period subsequent to vegetation clearance and during infrastructure foundation excavation.

3) Accepted, an archaeological watching brief will be conducted during the period subsequent to vegetation clearance and during infrastructure foundation excavation, as already recommended in the EIA.

4) It is also recommended that a Disaster Plan, along with an Evacuation Plan be established for the development.

4) Accepted, this will be submitted with the detailed building application containing at a minimum the components as set out in the EIA at Chapter 7 section 7.2.

SPECIFIC COMMENTS

Chapter 1, Section 1-3 Geology

5) The description of the rocks underlying the site given as “Iron Rock Formation and Montpelier, Yellow Limestone Formation” (also described in Chapter 4, pp149). Based on information from the Negril 1:50,000 Imperial Geology Sheet 1, the geology of the area is comprised Gibraltar-Bonnygate Limestone Formation of the White Limestone Group and the Coastal Limestone Formation. The information on the geology, as described in the document shows a clear lack of understanding of the geology of the area.

5) In Chapter One in Section 1.3 of the EIA, the description of the geology of the area is indeed incorrect; however this was corrected by a further report by a Geophysical and Geotechnical Consultant, Lyndon Audley Brown PhD, which was contained within Appendix 23 of Addendum 2 submitted 9th June 2007. This report clearly shows a proper understanding of the geology of the area and concurs with the comment made above.

Chapter 3, Section 3-9

6) With respect to maximum run-up distances from the coast, a distance of 80 metres is noted in the document, similar to field survey readings collected by the Mines and Geology Division (MGD). However, the variations in the run-up distances are not as dramatic as those indicated in the document.

6) It is pleasing to hear that the Mines and Geology Division concur with the EIA storm surge report contained in Section 3.9 of the EIA although the variations in the run-up distances are not as dramatic as those indicated in the EIA.

7) With respect to the setback from the coastline for storm surge mitigation, there are a number of shoreline/coastal engineering protection options which could be effectively combined with a minimum setback based on field evidence derived from Hurricane Ivan (1:50 yr event).

7) We will investigate your suggestion that engineered protections could be incorporated within our design and used in conjunction with the setback technique and submit any proposals we may have with the detailed building application.

8) A quarry licence should be obtained from the MGD to operate a quarry to supply construction material for the site.

8) A quarry license will be applied for prior to the commencement of excavation works.

Page 1, Section 0.1 Introduction

9) The characterization of this development as an “Eco-tourism Resort” does not conform to internationally recognized description of eco-tourism. At a minimum, the EIA should provide data as to what percentage of the proposed development site (terrestrial component) is (a) currently under woodland, and

(b) what percentage of this native woodland will be left undisturbed to warrant calling this an “Eco-tourism “ resort and a “Sustainable Ecologically Friendly Mixed use scheme” (Pg 3).

9) Doctor Eric Garraway and Doctor Peter Vogel, both professionals and experts in their field and lecturers at the University of the West Indies, have been consulted on the comment of the percentage retention of woodland. It should be noted however, before listing the findings and conclusions of Dr Garraway`s and Dr Vogel`s report that, the new development plans submitted with Addendum No 2 Appendix No 25 and particular reference is drawn to plan P215 A-SO3 Revision H, shows areas shaded green as park land/amenity. These areas are mainly areas of steep rocky cliff`s which have the best maintained forest features, as recorded in Dr Garraway`s original report in Addendum No 2 Appendix No 21. As a result of this, proposed buildings have been taken out of these areas to ensure their conservation. However not all of the green shaded areas have maintained forest features and some of the vegetation in these areas is less than desirable. It is envisaged that these areas will be utilised as nursery areas for other specimens collected from around the site and eventually new native forest will be established, thus increasing the existing area that is actually on the site at the moment.

Dr Garraway and Dr Vogel`s report is as follows;

“Coverage percentages of the major habitat types are included in Addendum No 2 Appendix No 21 of the EIA. The term “native woodland” is not used in our report, but implies our category “disturbed forest”:

- Dominance of species native to the original forest
- Only minor intrusions of exotic elements
- Fair abundance of tall trees representing a variety of native species of the original forest

We estimate that disturbed forest covers approximately 20.5 ha of the site. The development plan proposes to establish 26.3 ha of protected native forest, both through protection of existing disturbed forest and rehabilitation of rinate habitats. Thus, the project will result in a 28.3% net gain of native forest. This forest will mature over time due to strict protection and management. The likely result of foregoing the project will be a continuing degradation of the presently existing native woodlands due to charcoal burning, ganja cultivation, extraction of trees and other unsustainable activities.

Conservation and rehabilitation measures will be implemented from the start of the development activities. These measures will include:

- Fencing of conservation areas
- Monitoring of conservation areas to prevent further encroachment
- Education of construction workers regarding the conservation areas

The conservation activities could be coordinated by an environmental officer employed at the start of project implementation.

Gradually, sections of the conservation area will be made accessible along interpreted nature trails to residents and visitors for recreation and education.

Conservation, expansion and rehabilitation of native woodlands will also benefit threatened species”.

Page 3, Statement of Line 6

10) There is no further mention in the document of the equestrian facilities. It is not clear from the maps where stables and pasture will be located. Further, there is no discernable identification of bridle paths on the maps (horses and pedestrian traffic should be separated for reason of safety).

10) See the latest development plans;

P215A SO2 Revision F

P215A SO3 Revision H

P215A SO4 Revision H

P215A SO5 Revision G

These were submitted in Addendum No 2, Appendix 25 and now show a Sports/Recreation Hotel as opposed to an Equestrian Hotel at this location, there is now no intention to keep or offer horse riding facilities from this Hotel.

Page 6, Section 0.3.4.2 Vegetation Survey

11) The text should tell of the methodology, consistent with the header of Section 0.3.4 Methodology, p 5).

11) The detailed methodology for the Vegetation Survey is stated on pages 76, 77 and 78 of the EIA in section 2.1.1.

Page 21, Section 0.4.3.3 Sewage

12) The report refers to a letter from the NWC in Appendix XIII. No letter from NWC confirming “capacity to refine slurry from the onsite” treatment plant was found.

12) Although the NWC had verbally confirmed to our consultants the ability to accept slurry from the onsite treatment plant the confirmation letter never arrived. A letter was received from the NWC on the 4th of July which was dated 25th June 2007 which unfortunately states that the sludge cannot be accommodated at their Bevin Avenue facility in Montego Bay at this time (see Appendix 27 of this Addendum). It is possible that this situation may change in the future, however for the time being the following modification to the sewage treatment plant and therefore the EIA is proposed;

The plant will incorporate the latest technologies to provide for a safe and environmentally considerate process to treat and recycle sewage.

It is proposed to build the plant by a staged sequence to harmonize the optimum capability of the modular equipment with the project development programme.

The schematic diagram shows the areas where the stages can be added to meet demand (see Appendix 27 of this Addendum).

The scheme would include for grit removal, if it is considered there will be a risk of regular inflows of grit and it assumes reasonable allowances upstream of the plant will have been made to trap excessive FOG (fats oils and greases).

This would be followed by the use of a highly efficient primary clarifier capable of reducing the total suspended solids (TSS) and the biological oxygen demand (BOD) by 60% and 35% plus, respectively. The captured sludge in its slurry form (DS approx 4%) is transferred to a sludge digester plant where the process of biological digestion and pasteurization will release usable energy in the form of methane and render the thickened and reduced volume of sludge, slurry that is inert and safe to use to condition soil in the agricultural industry.

The primary clarified liquors will then pass to be biologically treated in a modified activated sludge reactor where phosphate and nitrate levels are reduced and the TSS and BOD levels further reduced to meet the tertiary consent standard for rivers and coastal areas set by NEPA. Disinfection is the final process which can also be integral with the main bioreactor unit(s).

As the inflows of waste water increase strategic step changes in treatment capacity can be made adding additional modules for primary, secondary and tertiary treatment standards to be maintained.

Page 25, Section 0.4.3.3.4 Sewage Treatment Module Choice

13) The EIA has not addressed the issue of how the sewage generated by the construction crew will be treated and disposed of during the construction phases.

13) At the commencement of building operations portable toilet systems will be used for the construction workers. These will be regularly emptied by an

approved disposal agent and be maintained to a high standard. One of the first building operations will be to construct a temporary compound area for welfare, storage and office facilities. This will include flushing toilets and washrooms which will discharge into a septic tank. This septic tank will be emptied by an approved disposal agent and taken to the NWC at Bevin Avenue in Montego Bay. The proposed on site sewage treatment plant will also be one of the first complexes to be constructed, after the necessary licenses and permits have been obtained, once this plant is fully operational the septic tank in the compound area will no longer be used, as the sewage can then be discharged into the onsite sewage treatment plant for disposal.

In instances where workers maybe working at distant points to the compound, portable toilets will be used in these areas thus ensuring the sewage is disposed of properly.

14) The Water Resources Authority (WRA) recommends that sewage be treated to the tertiary level, and as such sewage effluent should meet the NRCA Sewage Effluent Standards.

14) Agreed and already proposed in the EIA (also see comment and response 12 of this Addendum).

15) A detailed design of the proposed sewage treatment system should be submitted to the National Environment and Planning Agency (NEPA) along with an application for permit to construct and operate the plant. An application for licence to discharge the treated effluent to the environment should also be submitted.

15) A detail design for the on site sewage treatment plant will be submitted with the detailed building application along with applications for all necessary licenses and permits that are required. The proposed on site sewage treatment plant will treat the sewage to the required tertiary standard.

Page 29, Section 0.4.3.5

16) Mention was made of the construction of two (2) groynes to protect the marina access channel. However no mention was made of the number of groynes to be constructed to facilitate formation and maintenance of the five (5) proposed beaches.

16) There are no further groynes that will be built as part of the formation of the five beaches other than the two groynes for the protection of the Marina access channel. One of the beaches is primarily constructed as part of one of these groynes and is protected by it and partially constructed in the same way as the other four beaches, being cut carefully into the land behind the foreshore. In essence this operation utilizes and retains the naturally occurring rocky shore substrate in lieu of actually constructing groynes to provide the necessary protection from the off shore wave action. Sand will then be placed over the rock formation and the beach, being a semi circular shape, will prevent the sand from moving from the area with tidal flows. The sand will also be further stabilized with the planting of vegetation along the newly formed dune line. A Beach License has already been applied for.

17) Along with the groyne construction, the magnitude of offshore dredging may noticeably reduce sand accumulation along the Negril coastline resulting in beach erosion. The potential for such occurrence should be assessed.

17) After consultation with Mr. Peter Wilson Kelly, the author of the marina report in Chapter 3 of the EIA and Appendix 22 of Addendum No 2, it is concluded that beach erosion along the Negril coastline will not occur. Mr. Peter Wilson Kelly has confirmed that:

“Sand movement from marine sources onto the shoreline is directed from offshore along the path of oncoming waves - particularly during storm events. Shoreline sediment sorting, on the other hand is a function of the direction of long shore drift. A structure, such as the approach groynes, would only interfere with shoreline sediment stability within a few tens of meters down current of the structure and will not have a significant impact on the stability of any beaches further down current, since there would be a general movement of sand onshore. The structures would create a significant impact on sediment movement, if there was only one source of sand up current of the groynes. You may recall from my report that there is a fairly extensive bed of marine sand extending parallel to the entire west end shoreline, from which sand could be transported towards shore. Additionally, the shoreline along the west end is predominantly hard limestone, so there are no beaches within close proximity of the proposed groynes to be affected by them”.

The off shore excavation for the marina access channels is only approximately 18,365 cubic meters of material to achieve the required depth for boat access. The material to be removed is coral rubble and coastal limestone formation; no sand will be removed as the sand repositories are not located within this area, they are 200 meters off shore as originally described in Chapter 3 of the EIA report and the excavation for the marina channel only protrudes approximately 155 meters off shore.

Page 172, Section 4.2.3.1 Characterization of Study Area

18) The document indicates that there are a number of sinkholes in the area. However, the statement regarding the proposed development having no significant effect on the hydrologic regime of the study area should be substantiated.

18) The proposed development project is not considered to be a dense development in hydrological terms, although the coastal basin area is denser than the two upper shelves in drainage systems hence there are only small increases in run off and peak discharges for the higher drainage areas. All incorporated sink holes and other natural drainage systems will be properly upgraded and they will then enhance the Hydrological regime of the site. They will be utilised in a more effective manner and will be part of a maintenance programme, this will considerably minimise the projects impact on the hydrological regime on the area in an environmentally friendly manner. After completion of the new drainage system the site will drain in a more efficient manner than it does presently and have less negative impacts, such as soil erosion and flooding and it will therefore have no significant negative effect on the hydrological regime of the site, as stated in the EIA.

19) The major sinkholes within the site should be identified, their capacity estimated and if any sinkhole is to be blocked by the proposed development, the drainage scenario should be evaluated, ie the impact of this should be assessed and adequate alternative drainage should be put in place.

19) All major sink holes and other natural water drainage features will be identified on the more detailed topographical survey that will be undertaken in order to design and submit the comprehensive surface drainage/ storm water plan, that is requested to be submitted as part of the detailed building application as requested and agreed in question 2 above. Their capacities will be evaluated and presented as part of this plan. However from the topographical survey conducted to date and from the extensive field work investigations that have been made by the EIA's hydrology consultant Mr Howard Prendergast, it is his opinion that the site will have a number of natural drainage features, other than those already identified. He states that it is evident that the project area has relatively good drainage properties at this moment and when connected to a newly designed constructed system of pipes, swales, run off areas and culverts etc, that are properly maintained as part of the management plan, it will be more than adequate to efficiently drain the area successfully. If it is intended to block any sink holes in the comprehensive surface drainage/ storm water plan it is because they will not be required to be utilised to achieve a successful drainage system and therefore adequate alternative drainage has been put in place.

Sink holes that are to be utilised in the comprehensive surface drainage/storm water run off plan, will be identified and declared to be in a protected area to ensure that they do not become blocked during the construction process. They will be fenced off to protect them from vehicular intrusion and check dams will be constructed around them to prevent an accumulation of silt and debris during storm/ rainfall conditions. Strict monitoring of storm run off during the construction phase will take place along with strict monitoring of raw material storage (as noted in our answer to comment No 20). Where necessary natural drainage features will be modified and upgraded to better facilitate the inflow of run off from the area and an effective maintenance schedule including regular inspections for natural drainage features, will be incorporated by the contractors. If properly upgraded and maintained the existing sink holes, “wells”, depressions, soak-away areas and other drainage features can be utilized very effectively in an environmentally friendly manner thus, considerably minimizing the project impact on the hydrological regime.

Whilst a drainage plan for the project area can be designed in absence of the existing drainage features, the addition of such proposed features (including silt traps etc) would **considerably minimize** the impact on the hydrological regime.

Page 185, Section 4.12.1 Water Quality Impacts

20) It would have been useful to specify the nature of the “strict controls” that the contractors will be required to effect to ensure minimization of adverse impact on water quality.

20) Some of the “strict controls” that the contractors will be required to undertake to minimize any adverse effect on water quality are as follows;

- The provision of adequate toilet facilities as noted in detail in our answer to comment 13 of this document.
- Provision of an adequate number of solid waste, roll off type containers and skips around the site especially in the compound area.
- Welfare and mess room facilities will be provided in this compound area for use at meal time’s, thus preventing food packaging and waste littering the site.
- Containers and skips will also be used for building waste that will be produced. Care, through a waste campaign, will ensure the site is kept clean at all times.
- These containers will be emptied to an approved land fill site when ever necessary.
- A site waste management plan will be incorporated.

- Control of fugitive dust will be diminished by dewatering and bulk raw materials will be stored in stock piles (covered by tarpaulin sheets and will be earth banded). This bulk storage will not be positioned by the ocean/marina or, located by sink hole areas (there are no water courses on the site such as rivers and streams) to prevent them leaching into any of the sinkholes or the ocean at times of heavy rain fall.
- Control of transportation and construction vehicles will be strictly administered, only well maintained vehicles will be allowed on site to prevent diesel and oil spillage and delivery vehicles must be sheeted at all times.
- There will also be an area in the main compound for refueling and maintenance purposes for plant and vehicles, which will be fitted with an impermeable pad.
- A double skin diesel tank, that is hard wall banded to protect it from leakage, will be provided in the compound maintenance area.
- Hazardous materials stored in bulk, such as oils, thinners, paints and solvents etc. will be stored in safe storage containers.
- Waste oils and other hazardous liquids etc. will be stored in a safe area for collection by an approved recycler.
- Vegetation clearance and road works will be done in many phases, although there are four main phases proposed, the vegetation clearance for the phases will not be done all at once. Only areas for immediate construction will be cleared, thus preventing soil erosion and run off of sediments into the ocean.
- Areas which are stripped will have roads and drainage systems constructed to transport storm water in a proper manner to its point of discharge and all other outlets into the marina/ocean will have sedimentation traps fitted.
- Regular inspection of drainage culverts and swales etc. will be part of the construction process to ensure these are not blocked and operate efficiently at all times.
- Any exposed areas will be landscaped and seeded at the earliest practical point in the construction process to protect from soil erosion into the ocean and sink holes.
- Temporarily bund exposed soil areas to redirect flows from heavy run off areas that threaten to erode or result in surface run off to the ocean.
- A monitoring plan will be adopted to exposed soil areas during periods of heavy rain fall to ensure that any incidents are quickly controlled.
- Turbid dirty water from cement and concrete mixes will not be allowed to be washed out and discharged onto the ground, a special area within the compound will be provided with a sediment settlement basin and only the clarified water will then be discharged into the storm water drainage system.
- Any spillages of any materials will be immediately responded to and be cleaned up in accordance with the site management plan.

Page 191, Design Approach

21) Although the correct method is applied, the Report should present the Runoff Coefficients for the pre and post development as well as the rainfall intensities. In the absence of these figures, the WRA cannot comment on the estimated peak flows presented in the document.

21) The run off coefficients and rainfall intensities have now been inserted into tables 4 to 10 so that the WRA can now comment on the estimated peak flows. Tables 4 to 10 originally appeared in the EIA under the Design Approach in Chapter 4, pages 194 to 197 and again in Appendix 1V of the same document. The new tables replacing these can be found in Appendix 28 of this document.

22) The WRA database indicates that there is a flood prone area (JAD2001 E608022 N676913) to the southwest of the property, approximately 200 m north of the West End Road. The proponent is advised to consult the Office of Disaster Preparedness and Emergency Management (ODPEM) for information on historical flooding in this area.

22) Your advice to consult the Office of Disaster Preparedness and Emergency Management (ODPEM), has been taken and the EIA team have now consulted with them. Any associated potential impact analysis and appropriate mitigation methods will be included in the comprehensive surface drainage/storm water plan and the disaster and evacuation plan, both of which will be submitted with the detail building application, as requested and agreed in comment numbers 2 and 4 above.

Water Supply and Storage

23) The proposal for the installation of water storage tanks with a capacity of one day's supply of water is questionable, considering the nature of the development (resort) and the geographical location, viewing the history of disasters in the area. Additionally, the proposed volume for storage should be specified.

23) The proposed water storage tanks are in fact specified in their volume on page 65 of the EIA report under section 1.4.2.4.1. (In the forth bullet point). They are stated as being 2 at 250,000 Imperial Gallons and 1 at 500,000 Imperial Gallons; this information is also given on the plans contained in Appendix VI which shows the tanks proposed locations on site. On page 64 of the EIA report it states that a maximum site requirement of 650,000 Imperial Gallons per day may be required. Therefore there is a storage capacity of 1.54 days of supply, not 1 day as you have stated.

However in the light of your other comments we will increase the two 250,000 gallon tanks to 500,000 gallon tanks, giving a total storage capacity of 1,500,000 Imperial Gallons, which gives a 2.3 days supply at maximum anticipated draw off.

Fuel Storage and Dispensing and Berthing Facilities

24) The provision of any refueling and berthing facilities (include yacht washing) to vessels in the marina should be outlined in the Report, with associated potential impact analysis and appropriate mitigation measures.

24) There is no present intention to have refueling facilities at the marina; vessels are expected to use the existing facilities a little way down the coast at Negril Yacht Club. If this intention was to change an application for the necessary licenses and permits and mitigation measures would be addressed at that time.

The proposed marina will only offer berthing facilities with the provision to take on fresh water, to dispose of stored sewage from holding tanks, which will be by means of a pumped system and which will then be discharged into the site system for transmission to the onsite sewage treatment plant. Also a container facility will be provided for the disposal of solid waste, this will dealt with as set out in the EIA.

There is no current provision for yacht washing on the development where vessels are removed from the water. If this is required an application will be made for the necessary permits and licensees and any mitigation measures would be addressed in that time. The managing authority for the marina will not allow deck washing of vessels with detergents and solvents that will be harmful to the marine life to take place in the marina. These rules will also not allow vessels without holding tanks to pump out raw sewage into the water as common practice in Jamaica.

Dredged Material

25) It is estimated that 18,365 m³ of material will be dredged from the seafloor. Mention was made that the dredged material will be used in the development; however more specific information is needed as to how the material will be incorporated into the development and how any excess will be disposed.

25) The excavated materials (18,365 m³) from the marina access channel will be salt contaminated and will be used in the construction of the seaward part of the two groynes adjacent to the marina access channel. There will be no excess.

Water Treatment and Disposal

26) The EIA does not address the method of treatment and disposal of wastewater associated with spas and other recreational waters, to which substance such as oils may be added.

26) All facilities, such as spas and other recreational waters, to which substances such as oils may be added and where there is a possibility of FOG's (fat, oils and greases) being discharged into the sewage system will be fitted with separator traps at the point of discharge.

Hotels operating spa facilities will have specialist mechanical grease collectors housed inside concrete tanks on the premises so that water containing any FOG's will pass through first before going into the sewage system. Within the development final management plan there will be instructions for owners and operators to regularly clean and maintain the separators and a holding area will be available within the sewage treatment plant compound for them to be safely disposed off on site, they will then be disposed of to a local recycling agent for refining and recycling.

Floristic Assessment

27) The plant list (p 84-85) is insufficient in the sense that many species are not mentioned and incomplete by not mentioning endemic and threatened species.

27) Dr Garraway and Dr Vogel's comment as follows;

"Threatened species are listed in Addendum No 2 Appendix 21 in table 2 of section 2.1.4. The plants which are endemic are *Sabal jamaicensisi*, *Thrinax parviflora*, *Hohenbergia spinulosa*, *Hohenbergia urbaniana*, *Hohenbergia negrilensis* and *Agave Oberlii*. The EIA and its Addendum's addresses rare and threatened plant species including *Agave Oberlii* and *Zamia amblyphillidia*. At present, no management is in place to secure rare and threatened species within the site or anywhere in the wider surroundings. On the contrary, threatened species are under severe pressure from unsustainable use of critical habitats. Also, there is evidence of recurring fires in such habitats. If current conditions persist, the threatened species appear unlikely to survive on the site.

The EIA establishes the general policy that the development project must introduce effective conservation management thus securing the survival of

threatened species, and producing a net gain in native biodiversity within the site. The following project components will serve these objectives:

- Environmental management and monitoring will be implemented from the very beginning of construction under the direction of a qualified environmental officer.
- All designated conservation areas will be protected from the onset, regardless of the four phases of the project.
- Managed conservation areas will increase the amount of native woodland, and allow rehabilitation and maturation of these habitats that are now severely degraded. (See above for a more detailed discussion.)
- Both field assessments during the EIA and consultations with knowledgeable persons led to the insight that the steep cliffs together with the bolder zones below them are the most critical habitats for the threatened species. Initial plans to build houses into the cliffs were therefore abandoned. All cliffs and associated bolder zones recognized as critical habitats are included in the conservation zone. These areas will be fenced, and fire breaks during construction will be set up around them.
- A plant nursery will be established on the site. Before clearing, any area will be carefully searched for the occurrence of rare and threatened species. Specimens suitable for translocation will be moved to a site nursery where they are grown and propagated. The plants will be used for rehabilitation of the conservation area as well as for replanting developed sections of the site. The nursery will become a permanent feature after project completion.
- Rather than radically clearing housing sites before construction, mature trees and ecologically relevant clusters of native plants will be preserved wherever possible

It is expected, that these measure will increase populations of rare and threatened species both within and outside the conservation area. Indeed, the development project appears to be the only vehicle in sight to promote the site's biodiversity".

28) The specialists (p 5) were informed about a recently discovered new species of *Agave*, which is relatively common on the site, although geographically limited to a small area (above the lower escarpment facing South) of Negril Hill. It is endemic to this area only, i.e. it cannot be found anywhere else on the planet. The most mature stand of this extraordinary and very large monocot could well be on the development site itself; this needs to be investigated.

28) The new Agave you refer to is the *Agave oberlii*. This plant is referred to in the EIA as being present on the site. Reference is in fact made to it in the following areas;

EIA submitted April 2007;

- 1- In the text at page 78 in section 2.1.1.
- 2- In table 2.1 on page 84 in section 2.1.6.

In Addendum No 2 Appendix 21 submitted June 2007;

- 1- In table two in section 2.1.4.
- 2- In the text of section 2.4.1.
- 3- In the text of section 2.1.1.

Both field assessments during the EIA and consultations with knowledgeable persons led to the insight that the steep cliffs together with the bolder zones below them are the most critical habitats for the threatened species. Initial plans to build houses into the cliffs were therefore abandoned. All cliffs and associated bolder zones recognized as critical habitats are included in the conservation zone. These areas will be fenced, and fire breaks during construction will be set up around them.

29) The *Zamia amblyphyllidia* (Zamiaceae, a native cycad or commonly called 'Cardboard Plant') was not found by the specialists at all. The species is restricted to the Negril Hill area and occurs in a few small populations of approximately 10 to 30 individuals each. On the development site several individuals were seen in December 2006 on the lower shelf, most had been destroyed or damaged by recent clearing for subdivision roads. The existence of this species on the site should be established.

29) The *Zamia Amblyiphyllidia* (or cardboard plant as you have commonly called it) was in fact found on site and is mentioned in table 2 and section 2.1.4. of Addendum No 2 Appendix 21 therefore the existence of the species has been established on site.

We would also categorically state that no recent (within at least the last two years) clearing for sub division roads has taken place on the proposed development site (as shown on the development plans) and respectfully suggest that your comment must appertain to another piece of land which is not part of our proposed development site.

APPENDIX 27

**NWC RESPONSE
&
WASTE TREATMENT PLANT**



Water is life

10750 900 4000
Fax: (876) 988-3245

10750 900 4000
Fax: (876) 986-2718

10750 900 4000
Fax: (876) 994-9965

10750 900 4000
(876) 952 5824
Fax: (876) 952 5485

61 Main Street
St Ann's Bay, St. Ann
Tel: (876) 972-0111
Fax: (876) 972 1233

1 Lower Bevin Avenue
Montego Bay, St. James
Tel: (876) 940-3588
(876) 940-4447
(876) 952-8682

18 Rose Street
Savanna la Mar, Westmoreland
Tel: (876) 955-2652/7
Fax: (876) 955-2052

1 Park Plaza
Mandeville, Manchester
Tel: (876) 962 8494
(876) 962 7617
Fax: (876) 962 4562

June 25, 2007

Mr. Garfield Haughton
Civil and Environmental Engineer
45 University Crescent
Kingston 5

Dear Haughton,

Re: Request for the acceptance of sludge at the Bevin Avenue Sewage Treatment Works.

We acknowledge your letter of the 18th of March 2007 on the above captioned.

The National Water Commission wishes to advise that your request to accept sludge at our Bevin Avenue facility cannot be accommodated at this time.

The sludge digester has been out of operation for sum time now, with no immediate plans to reactivate this system in the near future.

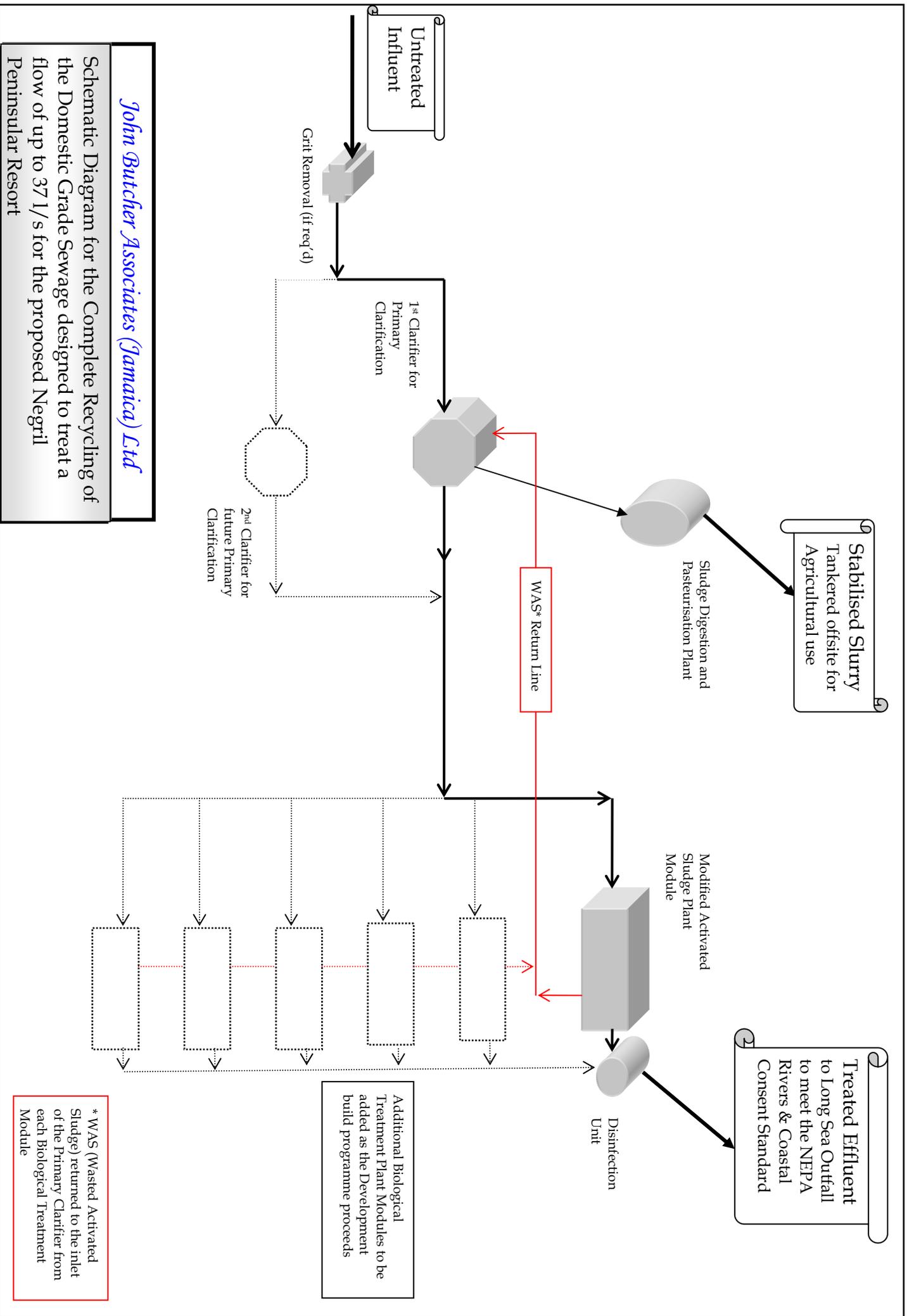
Respectfully we suggest you sought alternative arrangement to accommodate your sludge.

Yours sincerely
NATIONAL WATER COMMISSION

Mr. Mark Barnett (Mr.)
Vice President (Actg.)
Western Division

Cc: Chief Engineer (Snr. V.P)





John Butcher Associates (Jamaica) Ltd

Schematic Diagram for the Complete Recycling of the Domestic Grade Sewage designed to treat a flow of up to 37 l/s for the proposed Negril Peninsular Resort

* WAS (Wasted Activated Sludge) returned to the inlet of the Primary Clarifier from each Biological Treatment Module

Additional Biological Treatment Plant Modules to be added as the Development build programme proceeds

APPENDIX 28

STORM FLOW DESIGN SHEETS

Question 21 Page 191, Design Approach

“Although the correct method is applied, the Report should present the Runoff Coefficients for the pre and post development as well as the rainfall intensities. In the absence of these figures, the WRA cannot comment on the estimated peak flows presented in the document.”

TABLE NO. 4 Schedule of Main Drainage Areas

No.	Description of Drainage area	Approximate Area, acres
Drainage area 1	Upper shelf	90.0
Drainage area 2	Lower shelf	151.0
Drainage area 3	Coastal basin	120.0
	TOTAL AREA	361.0

TABLE NO.5 Storm Flow Design Sheet (Pre-development) – Drainage Area No. 1

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Qp, (CFS)
T = 2 YR	90.0	0.30	2.0	54.00
T = 5 YR	90.0	0.30	2.6	70.2
T = 10-YR	90.0	0.30	3.15	85.05
T = 25-YR	90.0	0.30	3.84	103.70
T = 50-YR	90.0	0.30	4.35	117.50
T = 100-YR	90.0	0.30	4.81	130.00

TABLE NO. 6 Storm Flow Design Sheet (Post-development) – Drainage Area No. 1

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Q _p , (CFS)
T = 2 YR	90.0	0.4	2.0	72.00
T = 5 YR	90.0	0.4	2.6	93.60
T = 10-YR	90.0	0.4	3.15	113.4
T = 25-YR	90.0	0.4	3.84	138.24
T = 50-YR	90.0	0.4	4.35	173.20
T = 100-YR	90.0	0.4	4.81	173.20

TABLE NO. 7 Storm Flow Design Sheet (Pre-development) – Drainage Area No. 2

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Q _p , (CFS)
T = 2 YR	151.0	0.30	2.0	90.60
T = 5 YR	151.0	0.30	2.6	118.00
T = 10-YR	151.0	0.30	3.15	143.00
T = 25-YR	151.0	0.30	3.84	174.00
T = 50-YR	151.0	0.30	4.35	197.10
T = 100-YR	151.0	0.30	4.81	217.90

TABLE NO. 8 Storm Flow Design Sheet (Post-development) – Drainage Area No. 2

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Qp, (CFS)
T = 2 YR	151.0	0.4	2.0	120.80
T = 5 YR	151.0	0.4	2.6	157.04
T = 10-YR	151.0	0.4	3.15	190.30
T = 25-YR	151.0	0.4	3.84	232.00
T = 50-YR	151.0	0.4	4.35	262.70
T = 100-YR	151.0	0.4	4.81	290.50

TABLE NO. 9 Storm Flow Design Sheet (Post-development) – Drainage Area No. 3

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Qp, (CFS)
T = 2 YR	120.0	0.25	2.0	60.00
T = 5 YR	120.0	0.25	2.6	78.00
T = 10-YR	120.0	0.25	3.15	94.50
T = 25-YR	120.0	0.25	3.84	115.20
T = 50-YR	120.0	0.25	4.35	130.50
T = 100-YR	120.0	0.25	4.81	144.30

**TABLE NO. 10 Storm Flow Design Sheet (Post-development) –
Drainage Area No. 3**

RETURN PERIOD, T	DRAINAGE AREA, (Acre)	RUN-OFF COEFF.	INTENSITY I, (IN/HR)	PEAK FLOW Q _p , (CFS)
T = 2 YR	120.0	0.5	2.0	120.00
T = 5 YR	120.0	0.5	2.6	156.00
T = 10-YR	120.0	0.5	3.15	189.00
T = 25-YR	120.0	0.5	3.84	230.40
T = 50-YR	120.0	0.5	4.35	261.00
T = 100-YR	120.0	0.5	4.81	288.6

**Prepared by: Howard Prendergast
SPK Consultants
July 9, 2007**