PROPOSED DESALINATION PLANT ATHOTEL RIU CREOLE-LE MORNE

N O N - T E C H N I C A L S U M M A R Y

Project Proponent

The project promoter, *"RIU Le Morne Ltd*" is a private company, duly registered and incorporated in Mauritius on the 13th March 2014.

The Moréva Hotel, formerly owned by Apavou Le Morne Ltée, has been taken over by the new promoter RIU Le Morne Ltd on the 11th June 2014.

Project Overview

The promoter RIU Le Morne Ltd has acquired from Apavou Le Morne Ltd a hotel complex comprising of 3No main hotels known as Mornéa Hotel, Moreva Hotel and Indian Resort Hotel respectively, the three hotels having been erected over a portion of land of the total extent of 10Ha 5521m^2being part of State Land.

The total bedroom capacity of each of the 3No main hotels is given below:

- Mornéa Hotel renamed by the new promoter as "Hotel RIU Coral" comprises of 144No existing guestrooms
- Indian Resort Hotel rebranded by the new promoter as "Hotel RIU Creole" encompasses 167No existing guestrooms
- Moréva Hotel renamed by the new promoter as "Hotel RIU Le Morne" harbours 182No existing guestrooms and an additional 37 guestrooms which consist of extension works being carried out within the hotel compound.

Hence the whole site encompassing the 3No hotels offers a total bedroom capacity of 530 rooms. However, the EIA application pertains to the installation of a desalination plant of a capacity of 500m^3/day within the compounds of Hotel RIU Creole formerly known as Indian Resort.

Project History

Initially Indian Resort, which started operation 12years ago, i.e. in 2002 under the promoter Apavou Hotel, occupied the whole site extent of 10Ha5521m^2 at Pointe Sud-Ouest, Le Morne. Within the ambit of diversifying the type of services offered by the marketing strategy, the site of 10Ha5521m^2 has been split into 3hotel sites known as Mornéa, Moréva and Indian Resort. The new owner RIU Ltd has acquired the 3No hotels, renovated them and extended the former Moréva Hotel to satisfy tourist demand.

Project Justification

All the hotels located along Le Morne coast, namely Lux – Le Morne, DinaRobin Hotel, Le Paradis Hotel and St. Regis Mauritius Hotel have all been facing acute shortage of water supply from the CWA network during the past few years, especially during the drought season which unfortunately coincides with the end-of-year peak occupancy period of the hotels.

Several of these hotels have addressed this undesirable situation by installing desalination plants.

In this context, the hotel proposes to set a desalination plant within its premises, to act as an independent source of water supply – to supplement the shortfall in the CWA supply.

Project Scope

The project therefore consists of the setting up of adesalination plant, housed in a building ofdimensions15m x 5m x 2.16m high, situated within the hotel premises; the plant will have a nominal production capacity of 500m^3/day to meet the hotel's total daily domestic requirements.

Policy, Legal and Administrative Framework

An Environmental Impact Assessment of the proposed desalination plant has been prepared in compliance with the requirements of Section 15(2)(b) of the EPA 2002; it has addressed all the relevant environmental issues which have been duly predicted and evaluated, including the socio-economic factors.

Site Ownership

The hotel complex consisting of the three main hotels, among which Hotel RIU Creole, has been erected on a portion of land of the total extent 10Ha 5521m^2 being part of State Land, forming part of Pas Geometriques Le Morne Brabant situated at Le Morne in the district of Black River.

The plot of land bearing the Parcel Identification Number (PIN) 1912070164 is the subject of a lease agreement transcribed in TB277/118 from the Government of Mauritius in favour of the previous promoter for a period of nineteen and a fraction years starting from 29thApril 1999 and expiring on 30thJune 2018, renewable for four further periods of 10 years.

The acquisition of the hotel by RIU Le Morne Ltd from Apavou Hotel Le Morne Ltée has been duly registered and transcribed by Notary on the 11thJune 2014 in TV 201406/000624.

Environmental Characteristics of Project Site

The area of the project site which has been earmarked to accommodate the desalination plant is about 75m^2; the site earmarked for the installation of the desalination plant is located within the back-of-house area of the hotel in an existing building which was formerly used as the technical workshop of the ex-Indian Resort. The locus site is presently coveredwith grass with no trees or endemic plant.

The topography of this small project site is flat. The flora and fauna biodiversity will not be impacted upon since there is no vegetation of any appreciable floral value within the project site.

The climatological characteristics of the site, namely its rainfall, temperature, sunshine, wind regime are all within reasonable ranges for this area of the island, and will not adversely impact upon the proposed project.

Site Environmental Sensitivity

The total site extent of 10Ha 5521m^2,which actually harbours 3No main hotels among which the Hotel RIU Creolewithin whose compound the desalination plant will be installed, does not encompass any endemic flora and fauna.

The whole hotel site possesses a beach frontage of white sand all along its western boundary, over a length of approximately 950metres.

The RIU Hotels site adjoins the public beach of Le Morne towards its western boundary.

Technical Characteristics of the Desalination Plant

The plant will be of the reverse osmosis type and made up of non-corrosive components compatible with the treatment of saline water of salinity 34,750ppm which will be pumped from an intake borehole positioned at 99metres from the High Water Mark, at the northern boundary of the hotel site. The nominal process capacity of the plant will be 60m^3/hr (16.7 litres per second) for the production of 20m^3/hr of desalinated water. The process will produce effluent brine of salinity of the order of 52,000ppm. The concentrated salt water will initially be pumped and discharged at a constant rate 40m^3/hrto a dilution tank. Within the dilution tank, there will be mixing of the effluent brine at 52,000ppm salinity level with sea water of 34,750 ppmsalinity level pumped from the intake borehole at the rate of 144m^3/hour; the pumping rate has been so designed so that the salinity of the diluted brine at the outlet of the dilution tank will return to a normal salinity level of more or less 10% of the ambient salinity of about 38,500ppm - thus ensuring that the final effluent from the desalination installation will no longer constitute a threat to flora, fauna and human beings. Thereafter, the effluent from the dilution tank will flow by gravity to a rejection borehole situated at 114 metres from the High Water Mark, at the southern boundary of the hotel site. There will be a clear distance of 147 metres from the raw seawater intake borehole and the diluted brine rejection tank.

The desalination plant system design will encompass the following components:

Upstream of the RO System

- 2 Nos. Intake borehole at about 99metres from the HWM - 40metres deep
- 1No. booster feed water pump

Pre-Treatment

- 1No. chlorine dosing unit
- 1No. dechlorination dosing unit with control redox
- 1No. anti-scaling dosing unit
- 1No. sand filter

The reverse osmosis module:

- Fine filters
- High Pressure Pump with Recovery Device
- Energy Recovery Pump

- Reverse Osmosis Membranes and Pressure Vessels
- Control Equipment and Instrumentation
- Electrical Panel

Post-Treatment:

- Chlorination dosing unit
- pH adjustment
- Flushing/Chemical Unit module

Downstream of the RO system

- 2Nos Reject Boreholes at 114m from the HWM, at the southern boundary of the hotel site.
- 1 No Mixing/dilution tank located in the desalination plant room opposite to the RO modules

The proposed desalination plant is intended to act as alternative to the potable water supply from the CWA system, and will therefore be utilised on a 24-hour, 7 day-a week basis. This will result in anincrease in the availability of water resources in the CWA system being directed to beneficial domestic use to the existing population of the Le Morne village and its surroundings – which will improve their water supply. This is considered to be a positive environmental impact afforded by the project.

To ensure technical and environmental safety, a high standard of workmanship will be provided by the supplier CondorchemEnvitech. The service specifications will be stringently monitored by the project engineer to ensure a long-lasting construction.

Planning Policy Guidance Requirement and Compliance

The tallest feature of the installation of the desalination plant project will be the desalination plant room which will house the RO plant and which is 2.16metres high; thus the overall height of the proposed RO plant building is less than 10 metres which is in compliance with the PPG which specify that any construction height should not exceed 13 metres, when the building is situated within the first 81.21metres from the High Water Mark.

Generally, for developments along the sea front the Plot Coverage should not exceed 20% of the site area.Since the project will occupy a total foot-print of about 75m^2 located within the RIU Hotel's compound which is of an extent of 10Ha 5521m^2, so this criterion is not relevant.

The set-back distances from the High Water Mark are as follows:

- 2No. intake borehole…….99metres
- 1No. Rejection borehole.....…114metres
- Desalination Plant room.....…171metres

In accordance with the PPG the desalination plant room should be located at more than 30metres from the HWM. Therefore this aspect of the PPG has been complied with.

None of the following activities will be carried out either before, during or after the construction of the desalination plant:

- Sand mining
- Dropping of any material in the sea or on the beach
- Construction of any causeway or artificial island or groyne

Utility Planning and Civil Works

The proposed desalination plant does not require any potable water feed to operate.

The proposed reverse-osmosis facility will use seawater pumped from the intake borehole – BH1 at a rate of 60m^3/hour.

In order to run the desalinating unit, an electrical power of about 90 kW will be required.

The power will be supplied mainly through the existing electrical network of the CEB within the hotel compound; however, the Promoter will apply for a separate electrical meter which will be used solely for the desalination plant.

The proposed desalination facility will produce 4 waste streams as follows:

- Effluent water from the sand filtration process
- Backwash water from the sand filtration membrane cleaning process
- By-product water from the reverse osmosis process (brine solution)
- Spent membrane cleaning solution

The back-wash water from the filtration system upstream of the R.O apparatus, consisting of fine filtration followed by absolute filtration, will be discharged in the brine disposal pipework.

Cleaning solution from the reverse osmosis operations will be neutralised and disposed of through the wastewater treatment system.

Prediction and Mitigation of Environmental Impacts

The EIA has predicted and identified the environmental impacts as listed in the environmental matrix below – for which the mitigative measures have been discussed and addressed either qualitatively or quantitatively wherever it is meaningful to do so.

Environmental Parameter	*Prediction of Impacts*	*Mitigation Measure*
▪ Fire	▪ Destruction of Plant, plant room, equipment during operational life. ▪ Source of physical and bodily damages	▪ Provision of fire-fighting equipment(fire extinguisher and fire hose heel) in Desalination plant room. ▪ Safe and speedy evacuation into the open air for working personnel.
▪ Noise	▪ From construction equipment during construction ▪ Working personnel during operational phase ▪ During operation of desalination plant	▪ Limited to working hours only for construction activities. ▪ Health and safety equipment to workers whenever they need to enter the container. ▪ No exterior propagation being given that desalination plant will be fully enclosed in a container.
▪ Health and Safety	▪ Impact on workers and personnel during construction	▪ Safe working conditions shall be specified in the contract working document ▪ Appropriate signage ▪ Posting of Health and Safety Notices.
▪ Chemical Storage	▪ Accidental spills, always possible during operation life of the facility	▪ Immediate detection measures put in place. ▪ Apply contingency plan(elaborated in EIA report ▪) for chemical spill
▪ Brine Disposal	▪ Accidental Spills	▪ Immediate detection measures put in place. ▪ Apply contingency plan for brine spill(see Table 9-1)
▪ Flora and Fauna	▪ Insignificant	▪ No special measure

Environmental Parameter	*Prediction of Impacts*	*Mitigation Measure*
▪ Geology	▪ Insignificant	▪ No special measure
▪ Hydrology and Hydrogeology	▪ Insignificant.	▪ No special measure.
▪ Climatology	▪ Impact on climatological parameters negligible	▪ No special mitigative measure
▪ Water Supply for domestic use	▪ Not required	▪ Will be readily supplied from the existing water distribution network of the hotel. ▪ For the operating personnel.
▪ Domestic Waste Water	▪ Not required	▪ Existing wastewater treatment plant will be used.
▪ Electricity	▪ May cause fire hazards ▪ May cause electrocution	▪ Necessary circuit breakers will be provided ▪ Electrical earthing will be provided.
▪ Site Drainage	▪ Not applicable as the RO plant is containerised	▪ Appropriate storm-water drainage network already exists within the yard of RIU Hotels

EIA Report

This EIA addresses all the required environmental issues pertinent to the setting of the desalination plant, namely:

- The technical aspects (control instruments, filters, reverse osmosis technique, pressure pumps) and functional aspects (brine production rate, brine rejection rate, desalinated water production rate, storage) [Section 4]
- The prediction and mitigation of the relevant environmental parameters, considered impactful enough to be addressed (noise, disposal of effluent brine, etc.) [Section 7]
- The socio-economic aspects of the project [Section 8]
- The post-project monitoring including the Environmental Management Plan [Section 9]

Since the project is vital to the continued and sustainable operation of the RIU Hotels, all proactive measures will be taken by the promoter to achieve an environmentally-friendly and safe project which should not, in the first place, impact on its touristic operations and livelihood; it is expected that the appropriate Authorities will grant their consent thereto within the least possible lead time, being given that the hotel will re-open for its first tourist intake in February 2015.

An appeal is hereby made to the Department of Environment (DoE) for a fast-track approval of the EIA and the issue of the EIA Licence due to the fact that the opening of the RIU Hotels scheduled for February 2015which will fall in the dry season.