

Chapter 5.0: Identification, Prediction of Impact and Impact Mitigating Measures

5.1 Environmental Impacts

The scope of work and work methodology may have the following impacts on the physical environment. A list of potential impacts is listed below: -

- Destruction of vegetation and habitat
- Land Erosion
- Sewage Pollution
- Solid waste pollution
- Dust
- Noise
- Traffic
- Pollution from Hydrocarbons
- Pollution and degradation of river

It is to be noted that these potential impacts have been identified right from the design stage and the overall project methodology takes these on boards while planning the implementation phase.

5.1.1 Destruction of vegetation and habitat

5.1.2 Impact

The scope of work with specific reference to the construction of villas will inevitably cause the removal of trees and vegetation. The use of machinery during construction may cause the destruction of ground vegetation, bushes, grass.

5.1.3 Impact Mitigating Measures

A detail botanical survey has been carried out for this site and has been incorporated for the following purposes: -

- Auditing of naturalized, introduced, common, endemic, native and rare plant species
- Provide for a conservation action plan right from the design stage for endemic, rare species
- Help to landscape and construct around the plants to be conserved

As per section 4.5.3 all endemic, rare plant species will be preserved. The project goes a step further in proposing a Botanical Sanctuary along block IV to help reintroduce native



plant species. All endemic and rare plant species have already been identified and tagged for protection. The project will stretch its policy for conservation by building and designing around these plants.

The plants to be removed are plants that have been introduced or are common plant species which do not have any conservation value nor are they listed as endangered plant species.

Two mangrove species have been identified along zone 3 of the project and are found along the outer bank of the pond facing the river. These mangrove species as well as plants/grass as recommended by the Botanist will be preserved. The project will seek permission from the forestry department and conservator of forest as well as the Ministry of Fisheries prior to planting any tree species. It is proposed to send an action plan and work methodology to the authorities concerned prior to the implementation phase.

In the wake of its commitment to preserve endemic, native and rare plant species the site manager will ensure that appropriate information is channeled to workers and contractors as well as maintain general work discipline on site. Conditions will be imposed to contractors for the respect of the environment and its assets.

5.2 Land Erosion

5.2.1 Impact

The site has varied and drastic topography with a high plateau at about 20m a.m.s.l and dropping within a distance of 10m to 2.5 to 3.5m a.m.s.l. Inappropriate work methodology and setback on the high plateau may cause erosion of the edge of the cliff. Use of fills at specific areas at the lower plain may cause soil to be washed into water bodies.

5.2.2 Impact mitigating Measures

All constructions on the high plateau will respect appropriate set back based on the expert advice of the foundation engineer. All vegetation and geo-morphological characteristics at the edge of the plateau will be preserved.

No heavy machinery will work in the zone established as set back. A foundation engineer will advise on work methodology and will monitor work on a regular basis.

As per the recommendation of the soil engineer as well as geotechnical investigation, water management as well as storm water drainage will be treated as high priority in the overall design of accessory services around the built environment. No surface flow will be allowed.

Utmost care will be taken while working along river plain. Detail topographic and nearshore survey has addressed such issues as partial flooding of the river bank during

extreme weather conditions. It is envisaged to proceed with fill and compaction for part of the site especially at zone 3 to contour levels of 3.8m a.m.s.l and protect the same with rock revetment. All fills as well as method for soil stabilization through compaction will be designed and monitored by the foundation engineer. The working methodology will be to first use geotextile screen near water bodies prior to work. Rock revetment for the purpose of retention will be the next phase prior to proceeding with fills, soil compaction and stabilization. This work methodology and planning will prevent erosion of soil into water bodies. Works will be closely monitored by the foundation engineer as well as an environmental scientist.

5.3 Sewage Pollution

5.3.1 Impact

Inappropriate planning and design of septic system may cause pollution of water bodies. This project projects to build 51 villas and a restaurant. These may generate significant volume of sewage. As per the soil investigation exercise it has been observed that water table is relatively high especially in zone 3. Use of septic tanks and leaching field will cause contamination of nearby water bodies.

5.3.2 Impact Mitigating Measures

The project has identified the following parameters at a very early stage of planning of the project and these have helped in the design stage:

Soil investigation has concluded that the water table was high in the lower plain especially at zone 3. This has prompted the engineer to design a sewerage system which will have zero impact on the environment. The sewerage system is of the RBS type and is efficient in treating sewage at the tertiary level without odour. The treated water respects all norms at outlet. The sewerage treatment system has inbuilt alarm system to help in providing early warning for remedial action. Besides, the sewage treatment plant has electricity back up system in case of power failure. The whole system will be permanently monitored by a contractor specialized in such domain.

5.4 Solid waste pollution

5.4.1 Impact

Wastes generated from kitchen, restaurant and accessory services if not properly managed may cause direct impact to the surrounding environment, especially water bodies. Indirect impact will in such a situation be the proliferation of rats, cockroach and flies and emission of bad smell associated with it.

5.4.2 Impact Mitigating Measures

Such a project cannot accept any form of mismanagement of its solid wastes. The project will be committed to appropriately manage its solid wastes. Solid wastes will be sorted for its different components, stored at a central transfer point strategically located on site and channeled to licensed companies specialized in carting away of such wastes. These wastes will invariably be sent to official landfills or for the purpose of recycling. Residents of the Barachois IRS will be informed and guided about the above procedures through formal communication procedures.

5.5 Dust

5.5.1 Impact

During the implementation phase such works as clearing, supplies of materials to site, carting away, machinery works may increase the level of dust on site. Though this is regarded as a short term nuisance, it is imperative to mitigate such impact.

5.5.2 Impact Mitigating Measures

Good management and monitoring practices will be put into place to prevent spread of dust. Dust will be mostly in the form of soil material, cement, rock sand. The following management practices as listed hereunder will be included in the contractual document of the contractor: -

- During clearing works contractors will be instructed to stop work in the event of strong wind on site.
- As may be required ground should be partially wetted prior to clearing.
- Utmost care must be taken while handling cement and rock sand product.
- Construction materials will be properly stacked
- Use appropriate screening around site of work
- Inculcate a sense of Environmental responsibility towards the work force
- Install informative panels at strategic places at site of work to reinforce message
- Replant with appropriate vegetation at completion of work and using progressive landscape management system to hold and consolidate soil.
- Dispose off debris from the construction site by licensed waste trucks to authorized dumping sites.
- Ensure that no cement bags or other such material is disposed near or in water bodies
- No mixing of concrete or aggregates will be allowed near water bodies

Natural shielding effect provided by the Black River mountain range as well as the site topography would further minimize dispersal of dust. Once the project completed dust emission from site will be insignificant.

5.6 Noise

5.6.1 Impact

The scope of work for such a project will inevitably cause temporary emission of noise. Noise may arise from the following operations: -

- Felling of trees during land clearing for construction of villas
- Use of heavy machinery such as JCB'S, trucks, cement mixers
- Chiseling of rocks manually or through the use of grinders

5.6.2 Impact Mitigating Measures

Noise generation will be mitigated mainly by: -

- Use of machineries, which are in excellent working conditions
- Confining construction operations to normal working hours
- Refraining from construction activities during public holidays

5.7 Traffic Implications

5.7.1 Impact

The project proposes a new access road from the Black River highway to the site. Improper design and position of this access from the main road may impact the followings: -

- Traffic congestion
- Visual obstruction
- Impact on speed limit

Other forms of traffic impact may arise during the followings: -

- Construction
- Operation

5.7.2 Impact Mitigating Measures

The project design has already been discussed with the Traffic Management Unit and the Road Authority and as per letter of clearance obtained from these authorities, it is expected that the new access road will not impact the normal flow of traffic to Tamarin or towards Flic en Flac. Other measures that would be taken will be lighting of road in that region as well as installation of appropriate sign boards at strategic places to guide traffic.

During construction it is expected that there will be an increase of traffic in the immediate region with likely impacts on the overall traffic pattern. It is envisaged to



implement a traffic management and planning system during the construction phase where by all activities in and out of site whether for the purpose of delivery or carting away will be fed into a planning database where the followings will be noted: -

- Day to day activity on site
- Planning for delivery of materials (type of material, expected time of delivery, truck number and phone number of truck driver)
- Planning of carting away of materials and spoils
- Short term to long term advance planning of traffic

The above measures will ensure the followings: -

- Minimise congestion
- Avoid conflict in timing of delivery trucks
- Avoid queuing up of trucks on the main road or at access road

The site manager will be responsible for such management of traffic

5.8 Storm water drainage

5.8.1 Impact

Lack of such facilities as storm water evacuation may cause the followings: -

- Accumulation of water and the risks of mosquito proliferation
- Surface water run off due to build up of water
- Soil erosion and likely impact on water bodies

5.8.2 Impact Mitigating Measures

The project site will be provided with a drainage network for the collection and evacuation of rain water from roof and from surface water runoff. All roofs will be properly drained and kept free from stagnant water. Since no discharge outlet exists near the site, all rain water and potential surface water run off will be collected via drainage network to be constructed based on gravity principles and for eventual disposal in a properly designed silt trap prior to discharge in water bodies. The system along with the silt trap will be designed based on the followings: -

- Rainfall intensity for the region
- Existing freshwater network on site

5.9 Socio- Economic Impact

In the wake of this project Medine S.E.Co. Ltd has carried out a social impact analysis as well as a social need analysis. The complete report is included at annex 5.

5.9.1 Summary of Findings

Since September 2006, following the recommendation of the Medine Master Plan(MMP), Medine Sugar Estates has launched a series of social integration projects in the factory area namely the followings: -

- The Fondation Medine Horizons
- The Medine Training Centre in Pierrefonds
- The creation of the Bambous Hub which will include a Farmer's Market, a Learning Centre (literacy, computer and creativity courses and leisure park)

The promoters aim at supporting the inhabitants of the region with the right tools (funding, training, infrastructures) so that they are empowered to participate and benefit from current and upcoming developments in the area.

Among the sectors identified for support, the promoter will bring special attention to 1) education/ training, 2) social ills (HIV/AIDS, drugs, alcoholism) and 3) entrepreneurship.

The promoters of the Barachois IRS foresee the creation of approximately 1,200 jobs during the construction phase and at operation stage it is expected that more than 100 jobs will be created as direct employment.

5.9.2 Budget and Calendar

As indicated by the Board of Investment, the budget earmarked for social integration activities for this Barachois IRS Project amounts to (51*6,000 =) US\$ 306,000, equivalent to date to approximately MUR. 9,800,000.

The promoters plan to invest this amount in the target area, following the budget lines listed hereunder:

Sector	Planned amount (Rs.)
Education/schooling	1,000,000
Training / reskilling	2,800,000
Entrepreneurship	2,000,000
Leisure and sports	2,000,000
Associations, forces vives	2,000,000
Total	9,800,000

The promoters are confident that many worthy projects will be proposed in the meantime, for financial and technical assistance, which will deserve support from this budget.

It is proposed that the calendar of disbursement be elaborated out jointly with the Board of Investment, after approval of the project. The promoter is confident that the amount can be disbursed within two years (24 months) after launch of this social integration action plan.

In the broader term the accent on social integration should include the followings for a win –win situation.

- Preserve social and cultural diversity. Foster tolerance
- Meet basic needs and seek to eliminate poverty
- Improve equity within and between nations and organisations
- Improve equality of access to opportunities, especially education
- Ensure access to employment
- Marketing and education to promote sustainable lifestyles
- Develop sustainable patterns of consumption

5.10 Desilting of Pond

5.10.1 Impact

The pond present at zone 3 is presently in a state of siltation due to an artificial impoundment at its mouth. This has tremendous impact on the circulation pattern in the pond with secondary effect such as silting and poor ecology. The overall masterplan of the Barachois project includes rehabilitation of the pond by the following measures: -

- Removal of artificial impoundment at the mouth of the pond
- Desilting of the pond

Combined effects from the above measures may during the period of work put up silt in suspension and entrainment of its plumes towards the river.

5.10.2 Impact Mitigating Measures

The above forecasted impact can be circumscribed by the following methods: -

- Using geo-textile screens at strategic places
- Use of a submersible cutter suction dredger. The nature of the bottom sediment which is mostly silt and clay can be efficiently and quickly removed by this method. This work will be done prior to removal of the artificial rock impoundment at the mouth of the pond.
- All silts and clay material will be pumped into a decantation pond and disposed as appropriate under the guidance of authorities concerned.
- Since only about 80 cm of accreted silt/clay will be removed from an area of approximately 70m x 30m the work scope is judged low and can be completed within 5 days.
- Eventual removal of the artificial rock impoundment will allow proper flushing of the pond with expected positive impact of increasing the population of fish fingerlings and fries.
- The immediate surrounding of the pond will be left intact.

5.11 Erection of Pontoon

5.11.1 Impact

The project envisages the provision of two pontoons at zone 2 and 3 respectively. This measure is judged essential because of the nature of the shoreline which is muddy. Provisions of these facilities will allow residents to have access to the frontage of the site for the following purposes: -

- Observation of nature
- Access to basic non-motorised water sports like canoes, kayak and small sail boats

Disturbance to the substrate during works may cause temporary sediment plumes.

5.11.2 Impact Mitigating Measures

Erection of pontoon will be done by the manual method by driving hot dipped galvanized angle iron bars into the substrate until refuse. The upper deck will be made of timber with a kiosk at the T- end. Treated pine logs will be used for cladding of the angle iron bars to allow for better aesthetics. Since the pontoon will be erected on piles, no impact on water circulation or sediment movement is expected.

5.12 Pollution from Hydrocarbons

5.12.1 Impacts

Use of petroleum products near water bodies may cause spillage and pollution.

5.12.2 Impact Mitigating Measures

This project does not envisage conducting such water sports as water ski in the river or estuary. The use of a security boat will be the only motorized boat from this project. No petroleum product will be stocked near water bodies.

5.13 Protection of Environmental attributes

This chapter can be summed up by stating very strongly that the essence of the overall project depends a lot on the attributes of the environment, i.e river bed, water flow, estuary, terrestrial vegetation, water plants and fauna that naturally exist in those water bodies. It is the proponent's firm commitment to protect those assets