

# **Sectoral Guideline No.2      December      2013**



*Ministry of Environment & Sustainable Development*  
*Department of Environment*

*Guideline on the content of an Environment Impact Assessment*

*Report*

*Golf Course*

**This Guideline is not a legal document. It serves as an environmental guidance and provides a template for the preparation of a comprehensive EIA Report. Copies of this guideline are available at the Department of Environment and on the website at <http://environment.gov.mu>.**

## PREFACE

Environment Impact Assessment (EIA) is a process and a tool which is used to identify, predict and evaluate both the positive and negative potential environmental impacts of a proposed development. It encourages promoters to take into consideration environmental factors to ensure proper site selection at the very inception stage of a project proposal. It is based on the precautionary principle, sustainability and the prevention approach. EIA should not be perceived as a hurdle for economic development. A project planning, properly and thoroughly undertaken, will eliminate obstacles to the project which may give rise to adverse environmental impacts that may be costly to mitigate or control.

This sectoral environmental guideline on the content of an EIA report concerns the setting up of a golf course and is designed to assist proponents and consultants in the preparation of a comprehensive EIA document. It is not exhaustive, but provides the essential structure and the detailed requirements of the EIA report.

This Guideline complements the Planning Policy Guidance 2004 (Design Guidance Golf Development) of the Ministry of Housing and Lands and the Golf Development Strategy for Mauritius of the Ministry of Tourism and Leisure.

Proponents are advised to refer to Part IV of the Environment Protection Act 2002 for necessary information on EIA in general.

<b>TABLE OF CONTENTS</b>		Page
<b>1.0</b>	<b>Introduction</b>	
1.1	Background	1
1.2	Objective of the EIA Guideline	1
<b>2.0</b>	<b>Structure and Content of the EIA Report</b>	2
	Cover Page	2
	Table of Contents	3
	Non-Technical Summary	3
	Chapter 1-Introduction	3
	Chapter 2-Policy, Legal and Administrative Framework	3
	Chapter 3- Site Description and Surrounding Environment	4
	Chapter 4-Description of the Existing Baseline Conditions	4
	Chapter 5-Project Description	5
	Chapter 6- Categorization and Method for Identification of Environmental Impacts	7
	Chapter 7-Impacts and Proposed Mitigating Measures	8
	Chapter 8-Public Consultation	12
	Chapter 9- Alternatives	12
	Chapter 10- Environmental Monitoring Plan and Environmental Management Plan	12
	Chapter 11 - Expertise of Consultant/ Consultancy Team	13
	Chapter 12- Conclusions	13
	Appendices and Supporting Documents	13
<b>3.0</b>	<b>Annexures</b>	
	Annex I- Guidelines for submission of EIA Reports in soft copy version	15
	Annex II- Checklist for accepting EIA applications	16

## 1.0 Introduction

### 1.1 Background

EIA is a tool which is used to identify, predict and evaluate both the positive and negative environmental impacts of a proposed development. It requires a multi-disciplinary approach and compares alternatives, including any alternative manner in which the project can be implemented. It aims at the best combination of economic, social and environmental benefits.

Championship 9-hole and 18-hole golf courses of international standard are now part of the Mauritian tourism scenery already known for the beauty of its coastal environment. There is potential to attract further markets of high end golfers by either building stand-alone golf courses or using golf as the anchor in hotel groups and Integrated Resort Scheme (IRS) around which many activities are established. The quality of design and construction must be high and the location of each course must complement Mauritius appeal as an exotic tropical island destination.

Impact during land clearing and construction phase of a golf course may relate to destruction of the biodiversity, disposal of waste, noise, dust, risks of erosion and tampering with environmentally sensitive areas such as wetlands. The main environmental concerns regarding golf courses relate amongst others to the availability and amount of water required for irrigation; pollution caused by the use of chemical pesticides, herbicides and fertilizers which have impacts on the terrestrial and marine water quality, biodiversity and on landscape and heritage features (if any). Hence the scope and the level of detail required will be a function of the site sensitivity, its size, the scale and nature of the proposed golf project.

Under Item 16 of Part B of the Fifth Schedule of the Environment Protection Act (EPA) 2002, “*Golf Course*” is a scheduled undertaking and warrants an EIA. The EIA report should contain a true and fair statement and description of the undertaking as proposed and should be in line with Section 18 of the EPA.

A proponent applying for an EIA licence should submit to the Department of Environment (Environmental Assessment Division, 2<sup>nd</sup> Floor, Ken Lee Tower, Barracks Street, Port Louis) 15 printed copies of the EIA report and in such additional copies as may reasonably be required by the Director of Environment and 2 soft copies in conformity with the Guidelines for Submission of EIA report in Soft Copy Version (Annex I). A processing fee of Rs 15,000 is currently applicable.

### 1.2 Objective of the Guideline

The objective of this guideline is to assist proponents and consultants in the preparation of a comprehensive EIA document that contains all the necessary information, while addressing the environmental aspects to enable a proper assessment. It also aims to encourage a consistent approach for a timely processing without the necessity to request for additional information.

*Note: This guideline is by no means exhaustive and should be complemented with other relevant documents such as the Golf Development Strategy for Mauritius of the Ministry of Tourism and Leisure, Planning Policy Guidance (PPG) of the Ministry of Housing and Lands, Outline Planning Schemes of the concerned Local Authority and the relevant acts and regulations.*



## 1.0 Structure and Content of an EIA Report

Cover Page

Table of Contents

Non-Technical Summary

Chapter 1- Introduction

Chapter 2- Policy, Legal and Administrative Framework

Chapter 3- Site Description and Surrounding Environment

Chapter 4- Description of the Existing Baseline Conditions

Chapter 5- Project Description

Chapter 6- Categorisation and Method for Identification of Environmental Impacts

Chapter 7- Impacts and Proposed Mitigating Measures

Chapter 8- Public Consultation

Chapter 9- Alternatives

Chapter 10- Environmental Monitoring Plan and Environmental Management Plan

Chapter 11- Expertise of Consultant/ Consultancy Team

Chapter 12- Conclusions

Appendices and Supporting Documents

### Cover Page

This should clearly indicate the title of the proposed project as listed under Part B of the Fifth Schedule of Environment Protection Act 2002 (as amended); location of the project; name of the proponent and consultant/consultancy firm and the date.

On a second page:

- Contact details and address of the proponent;
- Contact person (address, phone/mobile, email and fax number);
- The person responsible with contact details: address, phone/mobile, email and fax number;
- The team responsible for the preparation of the EIA report;
- The name of the consultant/s or consultancy firm, as applicable;
- The duly appointed legal representative of proponent (if any);
- The signature of the proponent or his duly appointed legal representative;
- The signature of all the principal consultants who have prepared or have assisted in the preparation of the EIA report;
- The main Directors, the Company Registration Number/ Business Registration Number (BRN);and
- Company Number as per Certificate of Incorporation.

## Table of Contents

This should indicate all the topics and chapters dealt with in the EIA report, their relevant sections and respective page numbers. It should indicate the tables, figures, acronyms and annexures.

## Non-Technical Summary

This should be a concise and short overview of the project in simple and non-technical language and should include the title of the project; a brief outline of the project and its location; a summary of the potential environmental impacts and proposed mitigative measures; outcome of public consultations; and conclusions.

## Chapter 1-Introduction

This chapter should include, inter alia, the type, size of the project, its location, scale and scope of works; project's aim, justification; the promoters' experience in similar projects; benefits to local communities and employment opportunities.

## Chapter 2-Policy, Legal and Administrative Framework

**2.1** "Golf Course" is a scheduled undertaking requiring an EIA. This section of the EIA should indicate compliance of the project with the relevant plans, policies, national laws, standards, guidelines, regulations and /or subsequent relevant amendments, and the protection of sensitive areas and how these are being addressed. These include, inter alia:

- The EPA 2002, the National Environmental Standards, Guidelines and Regulations under the EPA (e.g. Guidelines for Coastal Water Quality; Guidelines for Irrigation Water Quality, Guidelines for Inland Surface Water Quality and Hazardous Waste Regulations);
- Pas Géométriques Act, State Land Act, Wildlife and National Parks Act, Rivers and Canals Act, Forest and Reserves Act, Central Water Authority Act, Tourism Authority Act, Local Government Act; Dangerous Chemical Control Act;
- Plans and policies such as National Development Strategy, Golf Development Strategy for Mauritius of the Ministry of Tourism and Leisure, Planning Policy Guidance (Design Guidance Golf Development, Guidance for Desalination Plant and Wastewater Treatment Plant) of the Ministry of Housing and Lands.

**2.2** The promoters/consultants should ensure that the necessary permits/clearances/authorization from relevant authorities including Land Conversion Permit from the Ministry of Agro-Industry & Food Security, Ramsar clearance (as applicable in case of presence of wetland), clearance from the Forestry Services for felling of any tree are obtained including statement of intent from the utility authorities that the land is capable of being serviced.

The promoter/consultants are also advised to consult the authorities/ministries concerned to ensure that their requirements are clearly addressed in the EIA report.

Proponents should submit:

- Proof of ownership of land with copy of the Title Deed or a certificate issued by a notary expressing his opinion as to the owner's title;
- In case of state land, Lease Agreement or valid Letter of Reservation for the said activity; and
- Particulars of any consultation held with the public in the area where the undertaking is to be located.

## Chapter 3- Site Description and Surrounding Environment

### 3.1 Site and the Surrounding Environment

This chapter should provide a detailed investigation of the site, the surrounding environment and the sensitivity of the site. It should include, inter alia, the following:

- a) Location of the site;
- b) Exact land extent. The site should be indicated on a **Context Map of a scale of 1:10,000 or as appropriate** along with aerial photographs and/ or satellite images;
- c) Comprehensive **legible Site Location Plan of a scale of 1:5,000 or as appropriate, drawn and duly certified by a Sworn Land Surveyor** with appropriate landmarks as reference points. It should clearly provide indication of:
  - Any similar undertaking in the area;
  - Distance from the nearest settlement boundary;
  - Nearest residential areas/built up environment and any existing development in the vicinity;
  - Environmentally sensitive areas (if any);
  - Water bodies (if any);
  - Cultural and heritage sites( if any);
  - Designated sites of interest; and
  - Future/ forthcoming development projects.
- d) Existing land use and constraints along with suitability of the site for the proposed golf course;
- e) Description of the site characteristics in terms of site location (GPS coordinates of the boundaries delimiting the site), landform, topography and the range in elevation e.g. degree of undulation (supplemented by 1.0m interval contour map in case the site is sloppy), geology, soil type and characteristics (i.e. average depth, pH, chemical composition, electro-conductivity, drainage characteristics), presence of any watercourse, natural drain, any environmentally sensitive area, present and past land use, vegetation cover, flora and fauna, amongst others;
- f) A full terrestrial ecological survey describing the types, distribution and abundance of flora and fauna, Environmentally Sensitive Areas (sand dunes, inter-tidal mud flats, wetlands, mangroves, rivers), any protected, rare or endangered species, location of habitats (areas for feeding, refuge, reproduction or nesting for migrating species);
- g) Description of the shore types (as applicable) (sandy, muddy, rocky, cliffs, mixed, calcareous lime stone shore), landform, topography, elevation, magnitude of slope, slope stability, erosion, escarpments and landslide risks, presence or absence of lava tunnels supplemented by 0.5m-2m interval contour map;
- h) Vulnerability of the site to natural hazard, inundation or flooding; sea surges (as applicable)

### 3.2 Description of the present socio-economic values the site and its surroundings

- Socio-cultural value of the site;
- Socio-economic importance of the site e.g. recreational, any public beach and public access (as applicable), any agricultural activity;
- Socio-economic profile of the local community;
- Historical and cultural heritage value of the site.

## Chapter 4: Description of the Existing Baseline Conditions

This is a record of the site condition used as a benchmark against which to measure environmental changes following the implementation of the project. For the collection of baseline information, proponents/consultants should provide the sampling points locations, test parameters and methodologies. Some factors to be considered in describing the baseline environment should, inter alia, include:

- a) Baseline data on the basic land and hydrographic condition of the site, inter alia, in terms of: soil conditions (soil classification, suitability for method of sewage disposal); water quality, streamside condition (as applicable), presence of any borehole, river, marshland, drain, height of water table and areas vulnerable to erosion and other impacts from natural hazards or climate change; and
- b) Data on the terrestrial and freshwater (as applicable) ecological environment of the site, relevant meteorological data such as annual average rainfall (frequency, duration and quantity), temperature, evapotranspiration rate, strength and direction of prevailing wind (velocity and intensity), and existing nuisances such as odour and noise level.
- c) Results of percolation test as per BS 6297 duly certified by a Registered Professional Engineer in Mauritius or Soil Scientist should form part of the EIA report to ensure environmental safeguards of underground and surface water from agro chemicals.

## Chapter 5- Project Description

This chapter should provide a detailed description of all the activities that would be carried out and should include amongst others:

### 5.1 General Requirements

- a) A general description of the project and the different components;
- b) Style of golf course –whether the golf course is a resort course, championship course or ‘standard’ golf course for beginners and/or club golfers and whether the golf course will be open to the public;
- c) The golf course characteristics :Number of holes, total golf course length and par, the total land area of the golf course, shape of the site, detailed areas to be occupied by each of the golf course components (tees, fairways, greens and maintenance facilities), the type of grass on these components; total turf grass area and suitability of turf grass for the climate;
- d) **Detailed Site Layout plan drawn to a readable scale of 1:500 or as appropriate** indicating:
  - Site boundaries as per Title Deed or Lease Agreement;
  - All existing development/structure on site (if any) ;
  - The layout of the golf course indicating its different components;
  - All proposed structures to be put on site including the golf club house and maintenance facilities with setbacks from site boundaries and High Water Mark, river/rivulet and feeder reserves (as applicable), existing and proposed accesses with width; parking facilities, wastewater disposal structures, etc.
  - Width of buffer zones (no-spray zones) around water features and sensitive areas;
- e) Detailed **Building Layout Plans drawn to a readable scale of 1:100 or as appropriate** indicating elevations, plot coverage and building footprint ;
- f) Detailed architectural drawings **drawn to a readable scale of 1:100 or as appropriate on usually on A3 size** in respect of all buildings/structures;

### 5.2 Terrestrial Engineering Aspects

- a) Detail methodology and scope of works including soil preparation for turf grass plantation;
- b) Change in landform;
- c) Any cut and fill envisaged and extent;
- d) Type of machinery;
- e) Felling of trees including the number of trees to be felled and type, species etc.;

- f) Details on the drainage system below ground level to capture the infiltration of excess of agrochemicals so as to avoid ground water contamination;
- g) Details on the presence of watercourses, natural drains, canals within the site and measures envisaged to safeguard the watercourses;
- h) Any provision for drains and management of storm water runoff;
- i) Details on the design and capacity of the proposed drainage network including the final point of evacuation;
- j) Legible plan showing the proposed drainage network;
- k) Proposed irrigation water source; irrigation system (surface irrigation, sprinkle or drip irrigation);
- l) Availability of statutory services;
- m) Details on proposed access roads including width, length, etc.;
- n) Legible plan showing the road networks including the entry and exit;
- o) Transportation and mode of storage of construction materials;
- p) Use of local sources of supplies and materials;
- q) Generation of solid waste and wastewater ;
- r) Mode of disposal of solid waste and wastewater.
- s) Type of fuel. It's mode of storage, capacity, siting and distance from HWM/water bodies (as applicable) and infrastructure;

### 5.3 Operation and Maintenance

- a) Type of resources for e.g. water, fertilizers, pesticides, turf grass, fuel, electricity;
- b) Water requirement
  - Source, quality and quantity;
  - Volume required for irrigation purposes, mode and frequency of irrigation, storage facilities;
  - Alternatives sources of water supply envisaged (desalination, treated wastewater amongst others) with details on amount of water generated and available for irrigation at given times, the quality of the treated water and the level of treatment;
  - Irrigation management (i.e. monthly water budget and 10-year water supply-demand projection) and water conservation practices;
- c) Fertilizer requirement
  - Quantity, type and frequency of application;
  - Any use of organic fertilizers;
  - Mode of application;
- d) Pesticide requirement
  - quantity, type and frequency of application including toxicity and solubility;
  - application methods;
  - Details on any biological pest control and/or Integrated Pest Management;
- e) Handling, storage, application, and disposal procedures regarding the use of agro-chemicals including organics;
- f) Type of turf
  - Selection criteria in terms of disease resistance, salinity tolerance, nutrient and water requirements etc.;
  - Cultural practices;
  - Turf management;
- g) Type of plants/trees including species introduced for landscaping purposes;
- h) Fuelling of vehicles and maintenance of batteries;
- i) Effluent, solid waste and storm water disposal;

#### 5.4 Eco-friendly Measures and Sustainability

The environmental design and performance of the project should be based on a number of criteria, including energy and water efficiency, indoor environment quality and resource conservation.

- a) Details on measures adopted to make sustainable use of resources such as energy consumption e.g. renewable energy source (solar energy and photovoltaic cells, solar lighting), energy saving devices and efficient lighting (compact fluorescent lamps, bulbs with sensors) and water conservation e.g. water saving devices and rain water harvesting, potential for storage and use of eco-friendly agro chemicals, organic fertilizers (composting) and Integrated Pest Management (IPM);
- b) Buildings to be designed to minimize use of energy;
- c) Details on the technology for the refrigeration and air conditioning systems which should be energy efficient, ozone-friendly with an Ozone Depleting Potential value of zero and climate friendly.

#### 5.5 Traffic Implications

Detail on the traffic to be generated.

#### 5.6 Other Aspects

- a) Proposed implementation schedule;
- b) Duration of works (construction and operation phases);
- c) Capital investment;
- d) The marketing of the golf course and the levels of play envisaged;
- e) Opportunities to attract significant professional tournaments;
- f) Manpower and skills requirements;
- g) Employment opportunities.

### Chapter 6- Categorisation and method used to identify potential environmental impacts

The consultant should identify impacts for the golf course project which may, inter alia, be categorised as:

**Negative** (e.g. discharge of pollutants with adverse effect on the marine environment, degradation of the ecosystem, conflict among existing businesses) / **positive** (e.g. job creation, tourism and people influx); **direct** (e.g. change in land use) / **indirect** (loss of habitat); **short term** (e.g. noise and dust from construction works and vehicular movement) / **long term** (e.g. degradation of water quality of adjacent water bodies); **recurring** (e.g. eutrophication due to nutrient discharge in the water body) / **non-recurring** (e.g. Noise from machinery); **cumulative** (e.g. change in water quality which affects the aquatic food web and ultimately commercial fishery in the area) / **non-cumulative** whereby impacts do not accumulate in space and in time; **reversible** by natural means at natural rates or through human intervention (e.g. planting of mangroves, creation of artificial wetlands) / **irreversible** (e.g. elimination of wildlife habitats).

Proponents/consultants should demonstrate methods used to identify impacts which may, inter alia, include interaction matrices, Geographic Information Systems (GIS), modelling, ranking and weightage.

## Chapter 7- Impacts and Proposed Mitigating Measures

Impacts on the environment may occur during land clearing and site preparation, construction, as well as operational phase of the project. The proponent/consultant should propose feasible precautionary and mitigative measures to reduce the adverse impacts and enhance the positive impacts.

### 7.1 Impacts during site preparation phase

#### 7.1.1 Loss of biodiversity

Removal of vegetation, felling of trees may cause loss of natural habitat and degradation or destruction of environmentally sensitive areas like wetland. The proposed mitigating measures should include preservation and transplantation of trees, and compensation measures.

#### 7.1.2 Machinery /Equipment

Machinery / equipment, stand-by generators and diesel storage tanks on-site may pose the risks of hydrocarbon spills and contamination of soil, underground /surface water.

Necessary mitigating measures should be included in the EIA report to address the above impact.

#### 7.1.3 Noise and dust nuisances and air emissions from machinery and transport vehicles

Dust generated by earth-moving machinery, wind blowing upon the cleared site and stockpiled materials may be a cause of concern. In addition, vehicles and earth-moving equipment also emit exhaust fumes. Machinery and transport vehicles are also associated with noise nuisances.

Mitigating measures should be taken so as not to cause any nuisance by way of dust and air emissions to the nearby residents, public and surrounding environment. These include, amongst others, water spraying of stockpiles, access road and the construction site; regular maintenance of all heavy machine and vehicles.

Noise reduction options include, amongst others, fencing to screen noisy operations, the maintenance of machinery and installation of silencers to reduce noise emission.

#### 7.1.4 Preservation of drains and watercourses

Tampering with natural watercourses and drains can have the potential risks of flooding of the site and its adjoining areas.

Natural watercourses and drains should be preserved and maintained. Any change in landform should be clearly indicated in the EIA report and should not impact on the drainage pattern of the site and the surrounding environment.

#### 7.1.5 Erosion and sedimentation

Land clearing, leveling and other earthworks may give way to erosion resulting in sedimentation of the surrounding water body.

Proponent/consultant should propose measures to prevent erosion which could include phased development, stabilization and protection of exposed areas and cut and fill slopes with vegetation as quickly as possible, timing of operations (avoid raining seasons to minimize the impact of run off), construction of sedimentation ponds (sediments removed from the ponds shall not be placed or disposed near waterways).

#### 7.1.6 Solid waste/ demolition waste

Solid waste may include green wastes from land clearing and demolition debris amongst others.

Best Management Practices to minimize solid waste and demolition waste include inter alia:

- Stockpiling of solid waste in a central area, away from water bodies;
- Re-use of demolition waste as backfill material;
- Collection, transportation and disposal of solid waste and demolition waste to the satisfaction of the Local Authority.

### 7.1.7 Traffic Implications

A detailed assessment of the traffic in terms of the impact area, condition and size of roads, number of machineries on site, transportation lorries during the site preparation should be included.

Detail on any damage to local roads due to operation of heavy machinery; access points, routing and parking requirement.

## 7.2 Impacts during construction phase

### 7.2.1 Machinery /Equipment

Machinery / equipment, stand-by generators and diesel storage tanks on site have the risk of hydrocarbon spills and contamination of soil, underground /surface water.

Necessary mitigating measures should be included in the EIA report to address the above impact.

### 7.2.2 Noise and dust nuisances and air emissions from machinery and transport vehicles

Dust, noise and air emissions during the construction phase from stockpiled materials, trucks, loaders, bulldozers can be a source of nuisance to the nearby residents, public and surrounding environment.

Mitigating measures include, amongst others, water spraying of stockpiles, access road and the construction site; regular maintenance of all heavy machine and vehicles.

Noise reduction options include, amongst others, fencing to screen noisy operations, the maintenance of machinery and installation of silencers to reduce noise emission.

### 7.2.3 Erosion and sedimentation

Proponent/consultant should propose measures to prevent erosion which could include phased development, stabilization and protection of exposed areas and cut and fill slopes with vegetation as quickly as possible, timing of operations (avoid raining seasons to minimize the impact of run off), construction of sedimentation ponds (sediments removed from the ponds shall not be placed or disposed near waterways).

### 7.2.4 Solid waste and construction debris

Solid waste may comprise domestic solid waste and construction waste materials, amongst others.

Measures to minimize the above impacts include:

- Sorting out at source and proper collection of all recyclable wastes for eventual recycling;
- Composting of all green and biodegradable wastes;
- Disposal of other solid wastes and non-compostable wastes to the satisfaction of the Local authority.

### 7.2.5 Wastewater

Wastewater from the workforce during the construction phase can be a potential impact causing ground/ surface water pollution.

Mitigating measures include the provision of on-site wastewater disposal facilities and carting away to the satisfaction of the Wastewater Management Authority.

### 7.2.6 Traffic Implications

A detailed assessment of the traffic in terms of the impact area, condition and size of roads, number of machineries on site, transportation lorries during the construction phase should be included.

Detail on any damage to local roads due to operation of heavy machinery; access points, routing and parking requirement.

Detail on an upgrading and construction of access roads to the site.

A Traffic Impact Assessment (TIA) may be requested by the Traffic Management and Road Safety Unit (TMRSU).

### 7.3 Impacts during operational phase

Impacts during the operation phase essentially relate to the effect of agro chemicals on terrestrial and marine water quality and biodiversity, solid waste and wastewater generation, amongst others.

#### 7.3.1 Chemicals Management

Golf course operation and maintenance require the use, handling and storage of agro chemicals that may represent a risk to human health and the environment.

The EIA report should detail out the name, description, classification, safety data sheet, quantity and storage methods of the chemicals and any hazardous materials. The EIA report should address measures for the protection of the workforce, the prevention and control of accidental releases in the environment, particularly in the watercourses. These could include good housekeeping and operating practices, training of workers in health and safety issues while handling toxic chemicals, use of the 'environmentally friendly pesticides amongst others.

#### 7.3.2 Contingency Planning

The EIA report should provide a contingency plan for any hazardous material spill.

#### 7.3.3 Safety Aspects

The EIA report should address any risks for fire and explosions from the storage of chemicals and potential consequence including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas. Issues relating to the safety of staff should be addressed.

#### 7.3.4 Hazardous Waste Management

The EIA report should indicate the type, characteristics, amount of, mode of storage, transportation and disposal of the hazardous waste e.g. empty hazmat cans, used batteries from golf course workshop as per local laws and regulations.

#### 7.3.5 Changes to Water Quality

Contaminants or nutrients washed in from storm water or irrigation water may pose a risk of toxicity to the marine and freshwater environment (as applicable). The EIA report should include name, description, classification, safety data sheet, quantity and storage methods of the chemicals and any hazardous material.

Best Management Practices to control water quality should be addressed in the EIA report along with the proposed mitigating measures which could include vegetation buffer around natural and marine environments to reduce the nutrient loading, use of slow-release fertilizers amongst others.

#### 7.3.6 Solid Waste

Solid wastes from a golf course may comprise of green wastes, non-biodegradable wastes such as plastics (fertilizer bags, insecticide and pesticide containers), and redundant machinery (e.g. mowers).

The EIA report should characterize the waste according to their source, composition and generation rates (daily and monthly basis). Turf grass clippings may contain traces of fertilizers, pesticides and must be composted. A waste management programme that considers best practices like prevention, reduction at source, reuse, recovery and recycling with facilities for receiving recyclable waste materials along with composting should also be included.

Collection, transportation and disposal should be to the satisfaction of the Local Authority.

#### 7.3.7 Wastewater Management

Wastewater generated from a golf course may comprise of wastewater from domestic sewage, food service, bathrooms, and equipment maintenance shops. The EIA report should indicate, inter alia:

- Source, type and expected volume of wastewater generated on a daily basis;
- The maximum number of workers to be employed on site;

- The physical, chemical and biological characteristics of wastewater, method of collection, treatment and disposal, the design calculations, drawings and dimensions of wastewater disposal system. Wastewater disposal system should be located at least 30 m from any existing watercourses.

Proponent should ensure that wastewater is disposed to the satisfaction of the Wastewater Management Authority.

## **7.4 General Impacts**

### **7.4.1 Noise impact**

The ambient noises emanating from a golf course are from engines, pumps, generators and other equipment. Mitigating measures should be proposed for noise nuisances. Noise reduction options could include, amongst others, installation of silencers, selection of equipment with lower sound power levels and electric motors such as compressors, pumps and stand-by generator to be housed in sound proof enclosures.

### **7.4.2 Storm Water Management**

The EIA report should, include, inter alia:

- Detailed design, specification and layout of surface drains for storm water disposal indicating position of oil water separators and grease traps (at refueling facilities, workshops, parking areas, fuel storage and containment areas) and final evacuation;
- Proposed means to treat any contaminated storm water;
- Give consideration for sustainable materials which minimize surface run-off, e.g. porous concrete, grass;
- Indicate their intention for achieving sustainable water consumption on site through water conservation measures like rainwater harvesting, use of tap with sensors, amongst others.
- Risk of contamination of groundwater and surrounding water bodies from leaching of agrochemicals and measures proposed.

### **7.4.3 Traffic Implications**

A detailed assessment of the traffic in terms of the impact area, condition and size of roads, traffic generated by incoming vehicles during the operation phase should be included.

A Traffic Impact Assessment (TIA) may be requested by the Traffic Management and Road Safety Unit (TMRSU).

### **7.4.5 Eco-Friendly Practices**

These should include, amongst others, use of bio fertilisers and pesticides, Integrated Pest Management practices, energy-saving devices and eco-friendly practices such as sorting of waste for recycling purposes, rain water harvesting, economic compact fluorescent lamps, renewable energy supply (solar energy and photovoltaic cells), solar lamps, green buildings and other similar facilities.

### **7.4.6 Climate Change Issues**

A vulnerability assessment with respect to climate change issues such as sea level rise, storm surges and other adverse climatic conditions should be provided along with the proposed adaptation and mitigating measures.

An Emergency Preparedness and Response Plan should also be included.

### **7.4.7 Socio-Economic Impacts**

The positive socio-economic impacts are increased revenue opportunities for local residents, influx of tourists in the local area, uplifting of the physical infrastructure and so on. The negative socio-economic impacts relates to conflicts between existing businesses, pollution of water body of economic importance amongst others.

Mitigating measures should be considered in terms use of alternative site (location) and the development of Corporate Social Responsibility Programme e.g. construction of a community Centre, development of golf programmes for youth in the community amongst others.

#### 7.4.8 Visual Impact (visual environment and aesthetics)

This chapter should indicate the intention to incorporate landscaping and embellishment works in the golf course project and how the development architecture, materials and paintings will blend with the natural landscape.

#### 7.4.9 Impact on heritage, historical and cultural features

The impacts on physical and cultural resources should be avoided by encouraging their conservation and enhancement. Measures should be proposed to avoid damaging significant cultural property and beliefs and measures to be taken to protect same, including buffer zones.

### Chapter 8- Public Consultation

According to Section 19(1) (b) of the EPA, an EIA report shall enclose particulars of any consultation held with the public in the area where the undertaking is to be located.

Consultation is required for information purposes and details on the project are explained to the public.

This section of the EIA report should indicate:

- Any interaction and outcome of consultation with the relevant Ministries/Authorities/Institutions including consultation with the Ministry of Tourism, Beach Authority as applicable.
- Stakeholders and communities likely to be affected by the project (NGOs, Force Vive, locally registered fishermen, local inhabitants, beach users etc.).

The following should also be provided:

- Establishment and record of procedure (e.g. notes of meetings, leaflets, public display, questionnaires, letters) by which the interested and affected parties were afforded the opportunity to participate;
- A brief about the interactions detailing the areas of concern, the list of issues identified and how these have been addressed in the EIA e.g. trade off;
- A description of the public participation process followed by a list of stakeholders and their comments, the venues and times of consultation should be included as an appendix. The outcome of consultative meeting should be provided.

### Chapter 9- Alternatives

The EIA report should provide details on any alternative manner in which the undertaking may be carried out to cause less harm to the environment including the 'no-development option'.

### Chapter 10- Environmental Monitoring Plan and Environmental Management Plan

#### 10.1 Environmental Monitoring Plan (EMoP)

An Environmental Monitoring Plan (EMoP) is required under Section 18(2) (l) of the EPA. This EMoP is indicative and should provide an indication of all the parameters which need to be monitored including noise and air quality, coastal water quality, river water quality, ground and surface water quality, etc.

**Once an EIA Licence is granted, a proper EMoP has to be submitted to the Ministry of Environment & Sustainable Development for approval taking into considerations the list of conditions attached to the EIA Licence as well as the proposals made in the EIA.**

The EMoP puts responsibility on proponent to carry out monitoring exercise to verify:

- Successful implementation and effectiveness of mitigative measures to address impacts as spelt out in the EIA document.  
**Note:** list of all mitigative measures as spelt out in the EIA document and corresponding monitoring exercise to check effectiveness of measures should be submitted in a tabular form.
- Compliance with EIA licence conditions, standards, guidelines and regulations.

The monitoring plan should comprise of baseline environmental parameters of the receiving media of the site and the surrounding environment prior to start of the project.

The following additional aspects, where relevant, should, inter alia, be addressed in the description of the monitoring activities:

- Arrangements for carrying out the work, responsibility for monitoring;
- Indicators to be measured, monitoring methods, equipment and calibration details to be used;
- Specific parameters to be monitored, monitoring locations and control stations; monitoring frequency and duration;
- Standards and guidelines to be used to compare monitoring results;
- Name of environmental consultant and accredited laboratory conducting environmental monitoring, analysis of environmental samples.

## 10.2 Environmental Management Plan (EMaP)

**Section 18(2) (n) of the EPA requires an EIA to include an Environmental Management Plan (EMaP) for the construction phase, in case of a new infrastructure proposal.**

The EMaP should address amongst others: infrastructural layout plans, summary of impacts and mitigative measures, identify clearly the roles and responsibilities for the construction phase, responsibilities on environmental management and protection (provide names, positions, mobile phone, contact numbers and e-mail addresses).

The EMaP should clearly spell out the obligation to be imposed on the contractor in the contractual agreement to ensure that there will be no environmental nuisance and pollution in terms of for example sewage disposal for on-site workers, management and disposal of excavated spoils, construction wastes and abatement of dust and noise nuisances amongst others.

## Chapter 11- Expertise of Consultant/ Consultancy Team

EIA requires a multi-disciplinary approach and involves expertise in various fields. This chapter should indicate the details about the composition of the consultancy team in terms of academic background, experience, area of study, contact details (complete address, phone and fax numbers).

The members of the study team may include the following specialization/expertise amongst others: landscape design (Landscape Architect or Golf Course Architect); engineering (environmental, civil, chemical); ecology (terrestrial, freshwater and marine); soil science and geology (Geotechnical Engineer); wastewater management; architecture and planning (versatile in sustainable building design);

## Chapter 12 –Conclusions

The final chapter of the EIA report should deal with the recommendations and conclusions which justify the acceptability of the proposed project in relation to the proposed mitigative measures.

## Appendices and Supporting Documents

These can be, inter alia:

- Extracts of reference documents, relevant laws, regulations and international conventions;
- Data for research work done for the project such as soil test results, biodiversity assessments, results of air and water quality, noise survey, climatic conditions (surges);
- Copies of clearances/permits obtained;
- Copy of Title Deed and annexes, land surveyors plan with PIN number and notary certificate;
- Particulars of any consultation held with the public in the area where the undertaking is to be located;
- Maps and figures;
- Certificate of Incorporation of the company

**Note:**

Proponents and consultants are requested to ensure that the EIA report contains all salient information as mandated under the Environment Protection Act 2002 and as per the checklist given at **Annex II** of this document. Any missing information may lead to the non-acceptance of the EIA application at the level of the Department of Environment.

The submission of false or misleading information is an offence under Section 85 of the Environment Protection Act.

## Annex I- Guidelines for submission of EIA Reports in soft copy version

### 1.0 Introduction

As per Section 18(1) (a) of the EPA 2002, proponents applying for an EIA Licence must submit 15 printed copies and two electronic forms of the EIA reports. The objective for the posting of the soft copy version of EIA reports on the website of the Ministry of Environment and SD is to enable users to access the EIA reports in a more user friendly format.

### Specifications of soft copy version

- 1.1 The soft copy version of the report, which should be identical to the hard copy version, should be submitted in electronic file preferably on a CD.
  - a. The document should be broken into different chapters with each chapter in a separate file. The executive summary also should be treated as a chapter and submitted in a separate file. If a chapter exceeds 50 MB, then it should be further broken down into files of less than 50 MB.
  - b. The table of contents also should be submitted as a separate file.  
All the chapters/headings/appendices listed under the table of contents should have proper naming. This is important to allow the user to know which file he/she is accessing.  
  
e .g .Chapter 10-Mitigative measures
  - c. The table of contents should provide links to the different chapters including the executive summary and appendices.
  - d. All filenames must
    - i. be less than 8 characters
    - ii. be in small letters
    - iii. start with a letter

The soft copy version should be page numbered, in the same order as the hard copy and should be submitted in **any one** of the following 2 formats *with security measures so that the document cannot be edited or printed:*

- HTML format
  - PDF format
- 1.1 All html files must be in htm extensions file format. All image files must be in the gif/jpg extension file format.
  - 1.2 The EA section will, open the electronic file in the presence of the applicants in order to ensure that the hard and soft copy versions are absolutely the same. In case the soft copy version does not contain documents, which are present in the hard copy version, the applicants would be called upon to fill in a form. Decision to accept or reject the soft copy version would be taken by the EA Division and the applicants would be informed at a later stage.

**Annex II - Checklist for accepting EIA applications**

SN	Particulars	Tick
1	Name, address, contact details of the proponent	
2	Person Responsible: Name, address, contact details	
3	The EIA duly signed by proponent or his legal representative	
4	Letter of appointment of the legal representative (as applicable)	
5	(a) The name and address of the consultant/s or consultancy firm	
	(b) Contact person ( address, phone/mobile, email and fax number)	
	(c) Qualifications of the consultant/s	
	(d) Expertise/experience in the area of study of all the consultants	
	(e) EIA duly signed by <b><u>all principal consultants</u></b>	
6	Contact person : Name, address, contact details	
7	List of main Directors (in case of a company)	
8	The Company Registration Number / Business Registration Number (BRN)	
9	Copy of Certificate of Incorporation of the company	
10	EIA report properly binded	
11	Format of EIA report is in conformity with the Sectoral Guideline on Golf Course	
12	No. of printed copies of EIA report (15)	
13	Soft copy in conformity with guidelines for soft copy version	
14	Non-technical Summary	
15	Proof of land ownership (copy of Title Deed / extract of Title Deed / Notary Certificate)/ Lease Agreement/ Valid Letter of Reservation	
17	Objective of project	
18	Project justification	

20	Site description and surrounding environment	
21	Extent of land	
22	Distance of site from settlement boundary and nearest residence	
23	Number of similar undertakings in the area (context plan)	
24	A legible context map of scale 1:10,000 or as appropriate	
25	A legible site location plan of a scale of 1:5,000 or as appropriate, drawn and certified by Sworn Land Surveyor	
26	A legible Site Layout Plan of a scale of 1:500 or as appropriate indicating the different components of the project and the setback from site boundaries.	
27	Legible Building Layout Plans of a scale of 1:100 or as appropriate	
28	Legible architectural plans and elevations of scale of 1:100 or as appropriate	
29	Legible plan showing the road networks, the entry and exit	
30	Legible plan showing the proposed drainage network	
31	Availability of statutory services & requirements	
32	Present land use	
33	Terrestrial ecological survey (flora & fauna)	
39	Project description	
40	The golf course characteristics: Number of holes, total golf course length, the total land area of the golf course, detailed areas to be occupied by each of the golf course components (tees, fairways, greens), the type of grass on these components; total turf grass area and suitability of turf grass for the climate	
41	Methodology and scope of works	
42	Associated infrastructural works on: <ul style="list-style-type: none"> <li>- Mainland</li> <li>- Coastal frontage (if any)</li> </ul>	
43	Fueling facilities (mode of storage, capacity, siting, distance from HWM/water bodies / infrastructures)	

44	Type of machinery and equipment	
45	Implementation schedule/ duration of works	
46	Environmental impacts during site preparation	
47	Mitigating measures:	
	Noise	
	Dust	
	Solid waste	
	Loss of biodiversity	
	Traffic impacts	
48	Environmental impacts during construction phase	
49	Mitigating measures:	
	Noise/vibration	
	Dust	
	Disposal of solid waste including construction debris	
	Disposal of wastewater	
	Erosion	
	Containment of sediment entrainment/plume –provision of geotextile screens (as applicable)	
	Traffic impacts	
50	Environmental impacts during operation phase	
51	Mitigating measures:	
	Chemical management	
	Hazardous waste management	
	Mode of disposal of solid waste	
	Mode of disposal of wastewater	
	Water quality management	
	Traffic impacts	
	Storm water drainage	

	Visual impacts and aesthetics	
	Measures to prevent contamination of groundwater/waterbodies/lagoon	
52	Eco-friendly measures:	
	Use of organic and bio-fertilisers	
	Integrated Pest Management Control	
	Sorting of waste/recycling	
	Water saving devices	
	Energy saving/ renewable energy	
53	Stakeholders likely to be affected by the project	
54	Outcome of public consultation	
55	Alternative manner of carrying out the undertaking	
56	Any inevitable adverse environmental impact	
57	Any irreversible and irretrievable commitment of resources	
58	Chemical Spill Contingency Plan/ Emergency Preparedness and Response Plan	
59	Vulnerability assessment with respect to climate change	
60	Adaptation measures with respect to climate change	
61	Environmental Management Plan during construction phase	
62	Environmental Monitoring Plan	
63	Rehabilitation measures (if any)	
64	Permits and clearances obtained	
	Land Conversion permit (as applicable)	
	Clearance from Ramsar Committee (as applicable)	
	Clearance from Central Water Authority	