

SSR INTERNATIONAL AIRPORT



ENV 8.02

ENVIRONMENT MANAGEMENT PLAN

FOR CONTRACTORS

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Executive Summary

This booklet has been prepared for contractors who carry out works at the airport for Airports of Mauritius Co Ltd (AML) or for any Airport stakeholder in order to enable all their activities to be carried out efficiently and in an environment-friendly manner.

The content of this booklet represents good practice for all types of work. It shall be applicable for works carried out by AML and those operating within AML owned premises.

Contractors employed by Airport stakeholders must be reminded that they must strictly adhere to all environment regulations relevant to the approved works that are in force at that particular time.

This document contains information relevant to both the main contractor and subcontractors.

Contractors & Subcontractors to sign off that the EMP has been complied with or identify breaches.

For the purposes of this booklet, the term AML representative shall generally mean AML employed or delegated persons.

Overview

In view of SSR International Airport expansion, Airports of Mauritius Co. Ltd (AML) has initiated numerous projects, many of which are currently being implemented. These construction projects are often associated with adverse environment impacts such as dust, noise and waste generation amongst others. As such it is the responsibility of the contractor to ensure that all activities are carried out in an environmentally friendly manner as far as it is reasonably practicable.

An Environment Management Plan (EMP) for contractors has thus been prepared to focus on the environmental factors related to their activities with respect to the airport. The EMP describes measures that contractors must follow to maximize compliance to regulations and minimize harm to the environment.

At the design stage of a project, all environment aspects must have been addressed and proactive measures should have already been proposed prior to implementation. However, the EMP is intended to be a practical document for use as a guideline (code of practice) by contractors working for AML or for any Airport-based stakeholder. It outlines the mitigative measures to be implemented as far as reasonably practicable, by the project team members during the implementation phase in order to protect the environment and minimize potentially adverse effects.

1. Objectives of the EMP

The primary purpose of the EMP is to provide information on a proposed activity, with the aim of emphasizing how the activity may impact on the relevant environmental factors and how those impacts may be mitigated and managed so as to be environmentally acceptable.

The EMP for Contractors aims to ensure that:

- all environmental safeguards are implemented correctly.
- site activities are effectively managed and coordinated with other trades.
- adverse impacts on the environment are minimised
- the biodiversity of the site is conserved or enhanced
- disruption / inconvenience to existing residents is minimized
- the contractor's activities comply with the requirements of all relevant legislations. The current environmental legislation (Environment Protection Act 2002) includes standards for Air Quality, Noise limits, Hazardous Waste Disposal, and Effluent Discharge.

2. Management of the EMP

The EMP document must be managed by contractor's personnel, including AML or Airport stakeholder representative. An important aspect of good management is defining roles and responsibilities and establishing a consistent documentation.

2.1 Roles and Responsibilities

Contractor's personnel must ensure that environmental commitments of this document are met as far as it is reasonably practicable and that work proceeds in compliance with environmental regulations and contract specifications.

The roles and responsibilities are defined as follows:

- a) The general contractor (Contractor) for the project is required to:
 - identify the receiving environment (air, land, water, biodiversity) on the site of works;
 - assess the risks and potential impacts of the projected activities on the receiving environment;
 - identify mitigating measures to ensure that the receiving environment is appropriately protected; and
 - ensure that the projected activities comply with the Environment Protection Act (EPA) 2002.
- b) Where no specific legislative requirements exist, the Contractor must, as far as possible, comply with guidance provided by relevant Codes of Practice or industry standards as a minimum.
- c) The Contractor is responsible for the implementation of the proposed mitigating measures and those outlined in this EMP.
- d) During project implementation, the Contractor should regularly monitor any adverse environment factors (Erosion, Dust, Noise, etc.) associated with each activity and any mishap should be reported.
- e) The Contractor must ensure that his Subcontractors abide by this EMP and implement the measures outlined therein as far as reasonably practicable.
- f) The Contractor must ensure that a copy of this EMP is available on-site and the site foreman or supervisor is familiar with its contents.
- g) The Contractor must designate a person on site who will be responsible for the coordination and implementation of the measures outlined in this document. Workers shall be made aware, who they should contact if they have environmental issues of concern.

- h) A representative designated by AML or the Airport stakeholder shall ensure that the contractor complies, as far as reasonably practicable, with the recommendations of this document.
- i) The Contractor shall allow the AML representative to periodically inspect his site, site offices and storage areas. The Contractor shall carry out, at his expense reasonable requests deemed to be necessary as a result of such inspections. Such inspections shall not relieve the contractor of his responsibilities.

2.2 Documentation

An important part in implementing the environmental practices during project implementation is ensuring that all relevant and pertinent documents are available to project personnel. The following measures could be implemented to ensure that all information is properly disseminated:

- a) All relevant project documentation must be available on site at all times including specifications, construction drawings, EMP and all permits and approvals;
- b) On award of contract and prior to any activity commencing the contractor must submit the following documents:
 - Proposed environment management strategies
 - Method statements
- c) The Contractor shall ensure that any reporting required by regulations is conducted in a timely manner.

3. Environmental Impacts associated with Project Implementation

A project normally constitute of the following major activities:

- Material ordering
- Material storage
- Site preparation /clearing of site
- Earthworks
- Construction (including structural, assembly, repairs)
- Site clean up

The various environmental impacts associated with these activities include:

- Erosion
- Change in topography causing disturbance to natural drain
- Destruction of indigenous plants
- Solid waste generation
- Dust & other emissions
- Noise pollution
- Ground & Surface Water pollution
- Spills of Hazardous Materials & Petroleum, Oil

3.1 Erosion

Erosion and sediment concerns can arise both during the construction phase of a project and following construction when the site clean-ups have occurred. Suitable mitigative measures are therefore required for temporary site conditions, which occur for a relatively short period during the construction phase as well as for the permanent conditions following the completion of the facilities and cleanup of the work sites. The grade or slope of the working areas that will be disturbed during the construction phase will determine the amount and complexity of the mitigative measures that will be required to ensure adequate erosion and sediment control.

3.2 Disturbing topography

During site clearance or on excavation, topography of the land may be affected causing disruption to existing natural drain on site. As such in the absence of natural drain, storm water flows by gravity via the easiest path (with minimum obstructions). This may become a problem if the storm water causes damage, for example, damage to cultivation or property of neighbours. In addition, puddles of water may be formed inducing disease carriers such as mosquitoes.

3.3 Destruction of indigenous plants

Clearing of sites may likely cause harm to endangered plant species. As such it is very important that a survey be carried out to identify the important plants located on site and establish an appropriate procedure to limit harm to those species.

3.4 Solid Waste

Wastes associated with project implementation generally include unused and excess material generated during site excavation, site clearance, construction, and renovation activities. These wastes may be rubble (concrete, bricks, and asphalt), wood products, plaster, metals, plastics, etc. These materials comprise approximately 15 to 30 percent of all waste disposed of in landfills. Solid wastes may also include food wastes generated by site workers on site. Further, some waste products may even contain toxic constituents that pose a risk to human health and the environment. As such a proper solid waste management is crucial.

3.5 Emissions & Dust Generation

During construction projects, heavy duty machines and vehicles (lorries, excavators, etc.) are frequently used on site. Emission of air pollutants could become a serious problem if the machines or vehicles are not properly maintained. On dry conditions, excessive dust may also be generated from the work sites and access roads. This may have a detrimental impact on the local environment, construction safety or integrity, and may also cause disruption to the normal activities of nearby residences or offices.

3.6 Noise Control

Noise emission is an imminent problem mostly related to construction operations. Noise is mainly generated during excavation works, drilling works and from operation of pneumatic tools. Excessive noise may become a nuisance to nearby residents and Airport personnel and hence proper controls must be applied to limit the impact.

3.7 Ground & Surface Water Pollution

During heavy rainfall, stored or excavated materials, oil/fuel spill on site may be washed away to the storm water system and be ultimately disposed to a surface water or drainage system. In absence of a storm water system, the contaminated storm water may penetrate the ground thereby contaminating the ground water.

3.8 Spills of Hazardous, Petroleum materials & Oil

Materials are classified as hazardous as per First and Second Schedules of the Standards for hazardous wastes, Government Notice No. 157 of 2001.

Improper handling, storage or use of hazardous materials and fuel/oil may lead to spillage and consequently resulting to land and ground water contamination. By implementing proper handling, storage and disposal of these materials during construction, the likelihood of accidental events that result in impact to the environment can be greatly reduced.

Handling and disposal of any hazardous material should be carried out as per the Standards for hazardous wastes, Government Notice No. 157 of 2001.

4. Environmental Procedures

The procedures included in this section of the EMP outline the mitigative measures and best management practices that could be implemented as long as they are practically feasible throughout project implementation to ensure protection of the environment. The procedures included in this document may be modified/updated to comply with new legislations.

Proper environment management involves compliance with: local environmental regulations (Table 1) and conformity with good management practices and standards of the industry.

Table 1: Current Environment Standards for Mauritius.

Environment factors	Regulations
Air Quality	Standards published in Government Notice No.105 of 1998
Noise	Standards published in Government Notice No.17 of 1997 and subsequent amendment in the Government Notice No 115 of 2003
Effluent Discharge	Standards published in the General Notice No.44 of 2003 and subsequent amendment in the Government Notice No. 44 of 2004
Hazardous Waste	Standards published in the Government Notice no. 157 of 2001

Every activity in the project implementation must be carefully analysed for any potential impact on the environment and mitigating measures should be established prior to implementation to limit environment degradation and ensure compliance with prevalent standards.

A detailed list of work practices and mitigating measures with respect to impact to the environment relative to each activity has been proposed at **Annex A** and it is the responsibility of the Contractor to ensure compliance with the proposed guideline as far as possible.

It must be pointed out that environmental management practices are not restricted to those procedures listed in this EMP (Annex A); other effective procedures can still be followed.

A Site Management Checklist is also included in this EMP at **Annex B**, which could be used by the Contractor to ensure that all proactive measures have been implemented as practically possible.

5. Environment Monitoring

An effective way to ensure compliance with Environment Standards is to have regular site inspection and monitoring of all activities and environment factors. A monitoring schedule has been proposed at Table 2.

Table 2: Environment Monitoring Schedule

Environment Factors	Parameters to be checked	Schedule
Air Quality	<ul style="list-style-type: none"> • Dust • Emission from vehicles & machines 	<p>Daily</p> <p>Daily</p>
Noise	Noise level should not become a nuisance.	Daily
Solid Waste Management	Solid waste collection & storage	Daily
Topography	Water accumulation & stagnation	Weekly
Stormwater network	Intrusion of waste materials or fuel/oil spillage	Daily

6. Exceptional Occurrences

In the least case scenario, unexpected happenings do occur and therefore an action plan should be followed to effectively mitigate negative impacts, in line with the guidelines under this section.

6.1 Fuel and Hazardous Material Spills

▪ Classification of spill

Spill can be classified as minor and major depending on the surface area as follows:

Minor spill: covering an area less than 10 m²

Major spill: covering an area greater than 10 m²

(Adapted from "Aerodrome Emergency Plan 2009, Airports of Mauritius)

In the event of a major spill, assistance from external organizations may be sought.

The following Emergency services may be contacted:

- AML - RFFS 6036188
- Police Stations
- Fire Services
- Ministry of Environment: 212 4385

The action plan presents a response system to deal with minor spill in the event of release of petroleum, oil, or lubricants or other hazardous liquids. The objectives of the Plan are to minimize:

- a) danger to persons;
- b) pollution of land and water;
- c) extent of affected area; and
- d) degree of disturbance during clean-up;

In order that the action plan be effectively managed in the event of an accident, the Contractor should provide training of his personnel before commencement of work on the project.

▪ Response to a spill can be described as follows:

1. The individual who discovers a leak or spill shall immediately provide notification and attempt to stop and contain the leak or spill as per instructions received during personnel training. The spill report should be as complete as possible and include:

- Exact location and time of spill;
 - Estimated amount and type of pollutant;
 - Source of pollutant and cause of spill;
 - Actions being taken to control spill; and
 - Damage observed
2. Work in the immediate area of a spill or leak shall be halted and the incident shall be reported to the AML Site representative.
 3. Under some circumstances, dispersants may be necessary to contain the spill.
 4. The spill shall be investigated for severity and impacts.
 5. The Contractor shall assume the overall responsibility of coordinating a clean-up which could include the following actions:
 - a) deploy on-site personnel to contain the spilled material using a dyke, pit, absorbent material or booms, as appropriate;
 - b) assess site conditions and environmental impact of various clean-up procedures;
 - c) choose and implement an appropriate clean-up procedure;
 - d) deploy on-site personnel to mobilise pumps and empty drums (or other appropriate storage) to the spill site;
 - e) apply absorbents as necessary;
 - f) remove any contaminated soil as directed by the AML Site Representative;
 - g) dispose of all contaminated debris, water, soil, cleaning materials, and absorbents to the satisfaction of the Ministry of Environment.; and
 - h) take all necessary precautions to ensure that the incident does not recur.
 6. Documentation of the incident must be provided to the AML site Representative.

The following resources could be available at an appropriate location in readiness to respond to accidental releases of fuel and/or hazardous materials:

- i. Absorbent materials (e.g., sorbent pads, Sorb-All, vermiculite).
- ii. Small equipment such as shovels, rakes, tool kit, sledgehammer, buckets, stakes, tarpaulins, one empty drum, protective equipment.
- iii. Fire extinguisher.

ANNEX A

***SUMMARY OF
PROJECT ACTIVITIES,
ENVIRONMENT ASPECTS &
CONTROL-IMPACT MEASURES***

Summary of Project Activities, Environment Aspects & Control-Impact Measures

1. *Materials ordering*

Env. Aspects	Objective/ Requirement	Control Measures
Solid Waste Management	Minimise waste	<ol style="list-style-type: none"> 1. Order materials in the required quantity only for the project. 2. Find suppliers that use less packaging.
Wastage of useable topsoil	Minimise the need to purchase topsoil	Strip topsoil at start of works and store in stockpiles no more than 1.5 m high in designated materials storage area.

2. *Materials storage*

Env. Aspects	Objective/ Requirement	Control Measures
Spillage of hazardous materials	Minimise spillage of hazardous materials.	<ol style="list-style-type: none"> 1. Store chemicals (diesel, oil, paint, thinner, benzene etc) in labelled impervious containers. 2. Obtain Material Safety Data Sheet (MSDS) for chemicals as far as possible; especially for those suspected to be toxic or dangerous. 3. Ensure site workers are trained in spill management. Develop and practice a spill clean up procedure, including where to find emergency equipment and how to use it.
Construction materials washing or blowing away	Ensure material storage area does not generate pollution	<ol style="list-style-type: none"> 1. Keep stored soil, construction materials and waste covered. 2. If not possible to cover stockpiles, ensure they are not higher than 1.5 m and are located within a sediment control fence, wherever important.

3. Site clearing & Construction

Env. Aspects	Objective/ Requirement	Control Measures
Soil Erosion	Minimise or prevent soil erosion during clearance of vegetation & construction activities	<ol style="list-style-type: none"> 1. Ensure that erosion and sediment control structures are installed prior to site disturbance wherever necessary. 2. On excavation remove vegetation, only in areas designated during the planning stage. 3. Check daily and after rain that any exposed soil is contained within the erosion and sediment controls.
Change in Topography	Minimise impact on natural drain	<ol style="list-style-type: none"> 1. Preserve natural drain as long as reasonably practicable and if not possible, provide proper drainage system on site. 2. After heavy rainfall, remove stagnant accumulated water as far as possible.
Flora conservation	Ensure conservation of endemic plants wherever possible	<ol style="list-style-type: none"> 1. Large trees shall be preserved as far as possible; 2. Ensure markings and fences are installed around important plants. 3. Prior to vegetation clearing, any rare or endangered plant species which have been previously identified (at the EIA stage) must be removed and transplanted to demarcated zones; 4. Ensure site workers are aware of important plants. 5. Prior to felling of any tree, get approval from the Forestry Service of the Ministry of Agriculture.
<p>Solid Waste Management</p> <p>Solid waste include green waste, demolition waste, construction waste & food waste</p>	<p>Minimise waste generation.</p> <p>Ensure proper disposal method</p>	<ol style="list-style-type: none"> 1. Store all collected waste in a designated storage area. 2. Keep all stored waste covered and such that to prevent overflow into stormwater. 3. Prior to disposal to landfill, investigate for reuse and recycling options. 4. Inform all subcontractors of waste minimisation procedures. 5. On site burning, burying or dumping of any waste materials, vegetation, litter or refuse shall not be permitted, as a general rule

ANNEX A

Env. Aspects	Objective/ Requirement	Control Measures
Air quality	Minimise dust from site and emissions from vehicular machines	<ol style="list-style-type: none"> 1. Burning shall not be used as a clearing method; 2. Put up dust screens (hoarding/fencing) along site boundary. 3. Keep stockpiles covered or wet down when not covered. 4. On dry windy days, wet access paths and work sites to suppress dust. 5. Fit dust catchers to equipment available (e.g. rockdrills to be equipped with dust collectors), wherever required to prevent disturbance to neighbours. 6. Ensure regular maintenance of all site vehicles-machines to prevent undesired emission. 7. Instruct Operator of machinery on site to shut down engine when idle.
Noise pollution	<p>Keep to site hours</p> <p>To comply with the requirements of the Noise at Work Regulations and BS5228 Code of Practice for noise and vibration control on construction & open sites.</p>	<ol style="list-style-type: none"> 1. Encourage use of quiet machineries. 2. Avoid very noisy activities at times that would cause disturbance to neighbours. 3. Fit noise suppressors especially to heavy machinery e.g: <ul style="list-style-type: none"> ▪ Diesel plant be fitted with effective exhaust silencers. ▪ Ensure that plant and machineries are of sound-reduced type fitted with properly lined and sealed acoustic covers. ▪ Pneumatic tools be fitted with means to reduce noise to the minimum possible. 4. Keep all machineries well maintained. 5. Site workers exposed to high noise level to use hearing protection
Wastewater Management	<p>Ensure proper disposal method.</p> <p>Wastewater include domestic wastewater, wastewater from washing, etc.</p>	<ol style="list-style-type: none"> 1. Contractors should provide mobile sanitary system on site for proper disposal of sewage. 2. All domestic wastewater shall be treated on site, or discharged into a conservancy tank for removal from the site and appropriate treatment or directly into the Airport sewerage system, if its performance is acceptable; 3. No toxic effluents, fuel/oil, paint shall be discharged onto the ground or in any water course.

ANNEX A

Env. Aspects	Objective/ Requirement	Control Measures
Stormwater network & Ground Water pollution	Prevent waste materials (soil, weeds, etc) and spilled fuel/oil to wash into the stormwater system and ultimately contaminate ground water.	<ol style="list-style-type: none">1. Keep all stored waste covered and such that to prevent overflow into stormwater network.2. Check erosion controls daily and repair when necessary3. Roads and pavements to be swept(not hosed preferably) daily as needed.4. Ensure regular maintenance of machines used on site – check fuel/oil leakage.5. Any workshop shall have an impermeable floor, bunded or sloped towards an oil trap to prevent any spillages;6. Pumps, compressors and other stationary machinery requiring hydrocarbons shall be placed on drip trays to be emptied and cleaned regularly;7. All oil /hazardous solutions spillage should be contained and not washed into the stormwater network.

ANNEX A

Env. Aspects	Objective/ Requirement	Control Measures
Handling of hazardous materials	All hazardous materials to be used and stored correctly.	<ol style="list-style-type: none">1. It is recommended that use of chemical clearing methods shall be prohibited in the vicinity of sensitive ecological areas.2. Make sure that all hazardous materials are stored in labelled containers and ensure that site workers are familiar with those labels.3. Instruct site workers and subcontractors on procedures when handling potentially hazardous materials.4. Ensure that only trained workers handle the hazardous materials.5. Transformers or equipment containing polychlorinated biphenyls (PCBs) shall not be used on the building site;6. Concrete shall not be mixed directly on the ground; care shall be taken to prevent cement to enter water bodies;7. It is recommended that, where possible, loading and unloading of materials occur in bunded areas to contain any potential spillage;8. Explain spill containment and clean up procedures to site workers.9. Regular inspections of hydraulic and fuel systems on machinery shall be done, and leaks shall be repaired immediately upon detection;10. Fueling and lubrication of equipment must be carried out in designated and approved locations. Surfaces of refuelling areas shall be protected to prevent any soil contamination11. Washing, servicing and fueling of mobile equipment shall not be allowed within 30 m of a waterway or drainage systems;12. All materials contaminated with hazardous substances should be disposed as hazardous waste.13. Dispose hazardous waste as per the Standards for Hazardous waste, Government Notice No. 157 of 2001.14. Call in a specialised contractor for disposal of any hazardous materials.

ANNEX B

GENERAL SITE MANAGEMENT CHECKLIST

GENERAL SITE MANAGEMENT CHECKLIST

Tick (✓) where applicable

Actions	Applicable	Yes / No
Are all sediment control structures in place, cleaned out and operating		
Have appropriate precautions been taken to protect important trees		
Have materials been ordered in the only required quantities		
Are materials stored in a designated area within sediment fences		
Are stockpiles properly covered		
Have truck drivers been instructed on site access to be used		
Are site vehicles regularly maintained (check for leaks & to limit Green House Gas Emission)		
Are vehicles maintenance & washing carried out in a designated area		
Have appropriate measures been taken to limit dust generation (use of dust screens, dust catchers fitted to equipment)		
Are dusty areas regularly damped		
Are noise suppressors provided to machineries		
Are water saving strategies practiced on site		
Are all collected waste properly covered and stored in a designated area		
Have necessary precautions been taken to prevent pollution of ground water, surface water and storm water.		
Are all hazardous substances stored on site properly labelled and has it been ensured that all personnel are familiar with the labels.		
Are Material Safety Data Sheets of all chemicals available on site		
Have personnel been trained and instructed on precautionary measures while handling the chemicals on site.		
Are there any spill contingency plan		
Have personnel been trained and instructed about the measures to be taken to stop, contain a spill and the clean up in case a spill occurs		
Are all staff aware of emergency phone numbers to use in case of large spill (such as the Rescue and Fire Fighting Services)		
Are there provision of absorbent material on site to contain spills if they occur		