ENVIRONMENTAL MANAGEMENT PLAN (EMP)

ACTIVITIES ASSOCIATED WITH GALORE TRADING'S PROPOSED HORTICULTURE IRRIGATION PROJECT, LOCATED ±2 KM NORTHWEST OF ORANJEMUND TOWN, KARAS REGION, NAMIBIA.

AUGUST 2021

EXPERTISE AND DECLARATION OF INDEPENDENCE

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by Galore Trading cc to undertake the environmental impact assessment process.

Immanuel N. Katali, the EIA Lead Practitioner holds a B.Arts (Honors) in Geography, Environmental Studies and Sociology and has over 6 years of experience in conducting EIAs in Namibia.

The consultant herewith declare that this report represents an independent, objective assessment of the environmental impacts and its mitigation measures associated with the activities and potential impacts of the proposed horticulture project.

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LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

DEA	Department of Environmental Affairs
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I.N.K	I.N.K Enviro Consultants cc
M^2	Meter Squares
MET	Ministry of Environment and Tourism

1 INTRODUCTION

1.1 Introduction to the Proposed Project

Galore Trading cc (hereinafter referred to as Galore), intends to construct and operate a horticulture irrigation project, located ±2 km southeast of Oranjemund, on two bordering agricultural plots, made available by the Oranjemund Town Council and measuring a total of 64 hectares (ha) (Figure 1). The project aims to produce fruits and vegetables (onion, tomato, green pepper, carrot, pumpkins and cabbage) in the early stages and expand to various other crops in the future, pending further suitability investigations.

The water for the irrigation project is proposed to be abstracted from the Orange River (located ±1 km east of the project site) to the irrigation site via underground pipeline and with the use booster pumps near the river. Bulk irrigation water will be piped from the river to a series of booster pump stations located on the project area to supply the various irrigation systems. The irrigation project aims to abstract water from the Orange River of approximately 1 million m^3/annum. A water abstraction permit will be submitted to the Department of Water Affairs.

This proposed project follows the footsteps of the Government of Namibia's aims and objectives to ensure agriculture productivity and food security as part of the Green Scheme Policy, "to maximise irrigation opportunities for agriculture productivity and social development around wetlands" and in line with Vision 2030 strategy.

Prior to commencement of any construction activities of the proposed project, an Environmental Clearance Certificate (ECC) is required on the basis of an approved Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). It is with this background that, I.N.K Enviro Consultants cc (I.N.K) an independent firm of consultants, was appointed to undertake the Environmental Impact Assessment process for this project. More details regarding the EIA process that was followed are presented in Section 1.4.

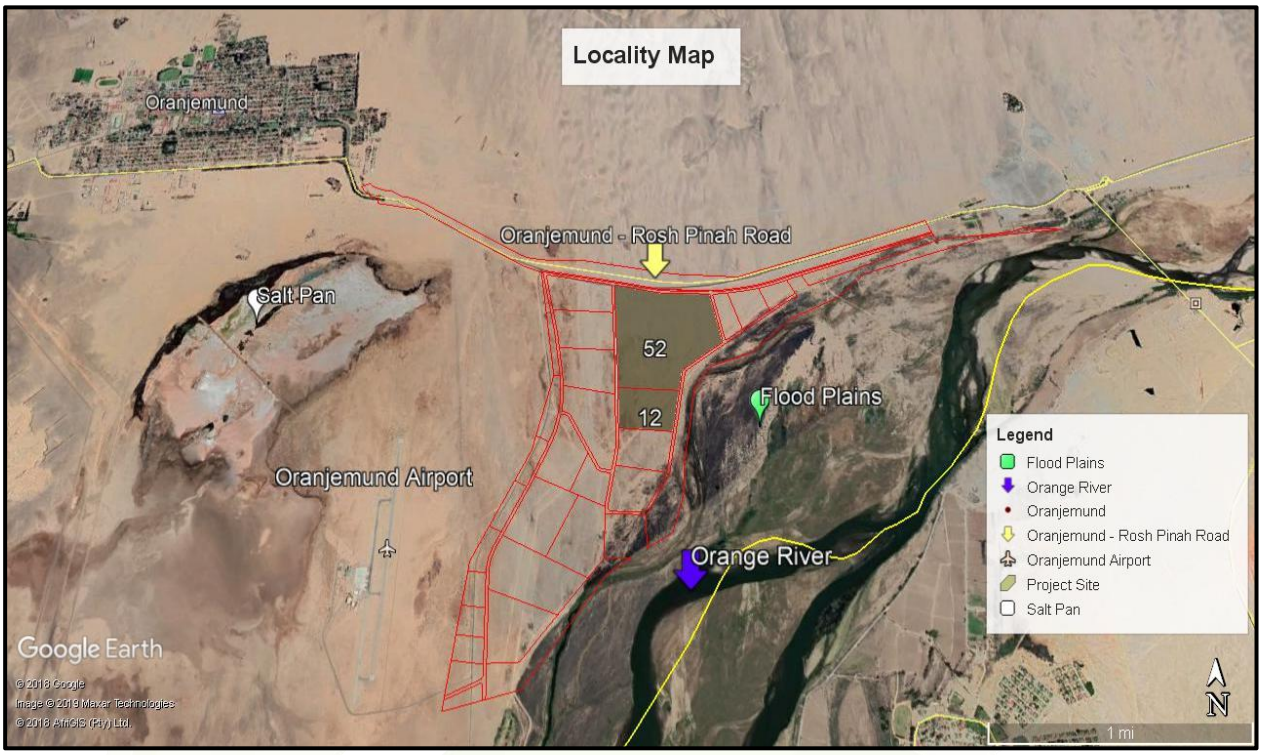

Figure 1: Location of the Proposed Horticulture Irrigation Project

The //Karas Region is in south-western Namibia and is known for agricultural, mining and tourism activities as the main economic drive. The proposed horticulture project is located adjacent to the Transboundary Water Resources (Orange River), currently shared by four individual countries (for their own water resources within their counties). The four countries referred to herein are; Namibia, South Africa, Lesotho and Botswana. This site is located in an area known as the Orange River Mouth Ramsar Site. These are sites selected worldwide to help protect wetlands of international importance.

1.2 Details of the persons who compiled this EMP

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by Galore Trading cc to compile the EMP.

Immanuel N. Katali, the EIA project manager and lead practitioner holds a B.Arts (Honours) Degree in Geography, Environmental Studies and Sociology and has over six years of relevant experience in conducting/managing EIAs, compiling EMPs and Socio-Economic Studies. Immanuel is certified as an environmental practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

1.3 Scope of Emp

The components of the EMP are included in Table 1: Content of the EMP below.

Table 1: Content of the EMP

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.2
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – Planning and design Construction activities Operation or undertaking of the activity Rehabilitation of the environment	Section 3
An identification of the persons to be responsible for the implementation of the mitigation measures.	Sections 4
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 4 & 5

2 LEGAL FRAMEWORK

The Republic of Namibia has five tiers of law and several policies relevant to environmental assessment and protection, which includes:

- The Constitution
- Statutory law
- Common law
- Customary law
- International law

Key policies currently in force include:

- The EIA Policy (1995).
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1994).

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

2.1 Applicable Laws and Policies

In the context of the proposed irrigation project, there are several laws and policies currently applicable. They are reflected in Table 1 below.

Table 2: RELEVANT LEGISLATION AND POLICIES

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous	Emissions to water (industrial & domestic)	Noise	Visual	Impact on Land use	Impact on biodiversity	Impact on Archaeology	Socio-economic	Safety & Health
1990	The Constitution of the Republic of Namibia of 1990	X	X	X	X	X	X	X	X	X	X	X
1997	Namibian Water Corporation Act, 12 of 1997	X									X	
2001	The Forestry Act 12 of 2001	X						X	X			
2013	Water Resources Management Act 11 of 2013	X			X						X	
2004	National Heritage Act 27 of 2004									X		X

2007	Environmental Management, Act 7 of 2007	X	X	X	X	X	X	X	X	X	X	X
2012	Regulations promulgated in terms of the Environmental Management, Act 7 of 2007											
1975	Nature Conservation Ordinance 14 of 1975	X			X				X	X		
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976		X									
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental	X	X	X	X	X	X	X	X	X		X

	Conservation	
2008	Green Scheme Policy	X
1995	National Agricultural Policy	X
2003	Agricultural (Commercial) Land Reform Amendment Act	X

3 ENVIRONMENTAL ACTION PLANS

The management measures proposed to mitigate the potential impacts relating to the construction and operation phase are detailed in the action plans below.

3.1 Action plans to achieve objectives and goals

Action plans to achieve relevant objectives/goals are listed in tabular format.

Table 3: Action Plan – Stakeholder Consultation/Communication Management Plan

Objective:

To ensure that regular communication is provided on the relevant irrigation activities, together with feedback on the environmental management performance of the irrigation scheme and that opportunity is provided for interested and affected parties to continue to raise comments and concerns (complaints) on the same.

No	Issue	Management commitment
These commitments apply to <u>all phases</u> of the irrigation project		
1	Understanding who the stakeholders are	Maintain and update the Galore Irrigation Project stakeholder register. Ensure that all relevant stakeholder groups are included.
2		A representative database would include government, employees, service providers, contractors, farmers, local communities (specifically the residents of the town of Oranjemund, NGOs, shareholders, customers, the investment sector, community-based organisations, suppliers and the media.
3		If relevant, include marginalised and vulnerable groups in the stakeholder communication process.
4		Record partnerships with local suppliers and investors as well as their roles, responsibilities, capacity and contribution to development.
5	Liaison with interested and affected parties	Devise and implement a stakeholder communication and engagement strategy. Quarterly meetings with the immediate neighbouring communities will be carried out.
6	Cooperative working relationship with stakeholders	Keep identified stakeholders informed about the irrigation scheme's activities.
7		Use appropriate communication channels to consult with, and disseminate information to, the identified stakeholder groups.

No	Issue	Management commitment
8	Managing perceptions, issues and/or complaints	Develop and implement a concerns/complaints (grievance) process for stakeholders and publicise the channels through which issues can be submitted to Galore. • Document all complaints in an external communications register; • Respond immediately to acknowledge receipt of complaints and comments; • Investigate and report on findings of issue to the complainant; • Keep complete auditable records of complaints, responses and actions taken; and • Introduce an independent mediator if the grievance / complaint cannot be resolved between NIBS Development and the affected party.

Table 4: Action Plan – Surface Water Management

Objective:

- To enforce efficient operation of storm water measures to ensure no spillage or leakage takes place.
- To enforce efficient management of farming practices to ensure possible pollution sources stored and used safely.

No	Issue	Management commitment
These commitments apply to <u>all phases</u>		
1	Pollution of surface water runoff	Storm water management, construction of infrastructure to contain contact waters.
2		Effective site supervision to ensure no blocking of storm water infrastructure and efficient storage of contact water.
3		Use bio-degradable and/or environmental products where possible, (EURO GAP).
4		Regular sampling of runoff water and Orange River to monitor pollution levels.
5		Storm water management, construction of infrastructure to contain contact waters.

No	Issue	Management commitment
6		Effective site supervision to ensure no blocking of storm water infrastructure and efficient storage of contact water.
7		A ground survey should be carried out prior to commencing with the project, to confirm local drainage lines and catchment areas.
8		Actual flow paths should be investigated in the field to confirm how surface runoff will travel.
9		Water samples should be collected from the Orange River in the vicinity of the proposed intake sites, to build up a baseline data set for river water quality, to provide information on the likely quality of water applied for irrigation purposes at the site.
10	Surface water abstraction	The neighbouring country Department of Water Affairs and Forestry equivalents will be notified of the proposed abstraction volumes prior to project implementation. Proof of these notifications will be kept.

Table 5: Action Plan – Groundwater Management Plan

Objective:

- Reduce concentration of contaminants in irrigation water to prevent pollution of underlying aquifer.
- Effectively control the volumes of water used to irrigate crops thereby reducing water logging and subsequent recharge.
- To reduce the recharge due to excessive irrigation activities, which will result in increased groundwater levels and possibility of salt crusts from evaporation of excess water.
- Effectively control the volumes of water used to irrigate crops thereby reducing water-logging and subsequent recharge.

No	**Issue**	**Management commitment**
1	Groundwater Quality	Apply water efficient irrigation methods and control of volumes of water used for irrigation.
2		Have proper storage of chemicals and fertilisers on site, (EURO GAP).

3		Use bio-degradable and/or environmental products where possible, (EURO GAP).
4		Implement a groundwater quality monitoring programme at the irrigation site and in areas where groundwater is used downstream, e.g. in production boreholes of communities near the irrigation project.
		Plant crops that are adapted to the climate and soil conditions and that don't require excessive volumes of pesticides and fertilizers.
		Maintain equipment to prevent leakages of contaminants.
		Dispose of materials properly at a suitable disposal site.
5	Groundwater Quantity	Install drip irrigation for effective utilisation and control of volumes of water used for irrigation
6		Maintain equipment to prevent leakages, meters on irrigation lines to monitor application rates.
7		Monitoring boreholes to monitor groundwater levels. Feedback from monitoring to change irrigation water application rates, should groundwater levels change significantly.
8		Operate with reference to EURO GAP codes and standards.

Table 6: **Action Plan – Air Quality Management Plan**

Objective:

The objective of the management measures is to prevent unacceptable air quality related pollution impacts.

No	Issue	Management commitment
These commitments apply to the construction phases		
1	Dust, PM_{10} and other gaseous emissions	Demarcate/fence off construction activities. No staff or vehicles to be permitted outside of these demarcated areas.
2		Keep construction footprint to a minimum.
3		Ensure all construction equipment is subject to an Inspection & Maintenance programme to ensure proper combustion.

No	Issue	Management commitment
4		Should excessive dust be generated by construction activities or due to cleared land and then dust suppression should be considered.
These commitments apply to the operations phases		
5	Dust, PM_{10} and other gaseous emissions	Develop and implement a complaints register to record any 3rd party complaints relating to the release of dust from exposed areas. Complaints must be investigated and actions developed.
6		Don't plough if the soil is dry and there are high winds.
7		Wet soils before ploughing.
8		Be sure to plant shortly after ploughing.
9		Do not disk when average wind speeds exceed 24 km/h. Do not till on fallow and bare ground when average wind speeds exceed 40 km/h.
10		Cover piles of fertilizer, compost, or soil.
11		Minimize soil-disturbing field operations such as ploughing, mowing, and tilling.
12		Modify the timing and type of operations based on soil and weather conditions.
13		Use cover crops like grasses and legumes where possible to help reduce wind erosion.
14		Pay attention to the dust created: use water or dust suppressants when substantial dust is blowing offsite.
15		Use physical barriers such as fences, straw bales, and large trees to minimize the flow of dust.
16		Pay attention to the dust created: use water or dust suppressants when substantial dust is blowing offsite.
17		Carry out dust monitoring at strategic locations

Table 7: **Action Plan – Noise Management Plan**

Objective:

The objective of the management measures is to limit excessive noise.

No	Issue	Management commitment
These commitments apply to the construction phases		
1	Noise	Restrict construction activities to daylight hours.

No	Issue	Management commitment
2	pollution	Refer to operations phase for general noise management measures.
These commitments apply to the <u>operations</u> phases		
3	Noise pollution	• For general construction and operational activities, the following good engineering practice should be applied including: ○ Regular maintenance of all diesel-powered equipment. ○ Enclosure of major sources of noise. ○ Following of good design philosophies for vibrating structures that are known to be noisy.
4		Noise-generating activities limited to daytime hours since noise impacts are most significant during the night.
5		Minimise individual vehicle engine, transmission and body noise or vibration through the implementation of an equipment maintenance programme and minimise the need for trucks or equipment to reverse.
6		Acoustic barriers are proven to be effective in reducing environmental noise impacts.

Table 8: **Action Plan – Biodiversity Management Plan**

<u>Objective:</u>

The objective of the management measures is to prevent or limit the unacceptable loss of biodiversity and related functionality through general disturbance and physical destruction.

No	Issue	Management commitment
These commitments apply to the <u>construction</u> phases		
1	Loss of biodiversity	Optimise the total size of the irrigation area by carefully considering the realistic productive capacity of the soils (use only the area that is needed to produce the target production).
2		Raise awareness through awareness campaigns and training of key staff.
These commitments apply to the <u>operation</u> phases		
3	Loss of biodiversity	Do not rely on chemicals as the main form of pesticide control. Rather use it as part of an integrated pest management approach. This will require monitoring of both the presence and abundance of different pests (fungi as well as invertebrates) and

No	Issue	Management commitment
		the effects of different management options.
4		Follow international standards of best practice in the use of pesticides, fungicides and herbicides in agriculture (e.g. http://www.ext.colostate.edu/pubs/crops/xcm177.pdf).
5		Select chemicals with low toxicity outside target groups (i.e. highly specific), short half-lives and high levels of adsorption (this will prevent leaching);
6		Use optimal, not maximal doses;
7		Apply for as short periods as possible and select days that are not windy;
8		Ensure that there is no overspray that drifts into the adjacent indigenous habitats or into areas of human habitation;
9		Given that most of the chemicals will be applied through the irrigation system, using an optimal water management approach based on measured soil moisture levels will also mean that leaching and runoff will be limited
10		Confirm the ecotoxicity of each chemical using an independent database such as the Pesticide Action Network (PAN) Pesticide Database
11		Herbicides are used widely, but there is little information on their effects on the plants of African savannas. It is best to adopt a precautionary approach here and assume that there will be negative effects on native plant species and that a very strictly controlled and directed application regime should be followed.
12		Integrated pest management (IPM) is the control strategy of choice. IPM is an approach to pest management that blends all available management techniques - nonchemical and chemical - into one strategy: Monitor pest problems, use nonchemical pest control, and resort to pesticides only when pest damage exceeds an economic or aesthetic threshold.

Table 9: Action Plan – Visual Management Plan

Objective:

The objective of the management measures is to limit visual impacts.

No	Issue	Management commitment
These commitments apply to construction phase		

No	Issue	Management commitment
1	Visual disturbance	No litter or waste accumulation will be permitted on site.
These commitments apply to operation phase		
2	Visual disturbance	Carry out regular maintenance in order to maintain visual integrity of the site.
3		No litter or waste accumulation will be permitted on site.

Table 10: Action Plan –Archaeology Management Plan

Objective:

To ensure that the correct actions are taken to preserve or document chance archaeological finds.

No	Issue	Management commitment
These commitments apply to construction and operation phases		
1	Chance Finds Procedure	The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person. Action by person identifying archaeological or heritage material: • If operating machinery or equipment - stop work; • Identify the site with flag tape; • Determine GPS position if possible; and • Report findings to foreman. Action by foreman: • Report findings, site location and actions taken to superintendent; and • Cease any works in immediate vicinity. Action by superintendent: • Visit site and determine whether work can proceed without damage to findings; • Determine and mark exclusion boundary; and • Site location and details to be added to project GIS for field confirmation by archaeologist. Action by archaeologist: • Inspect site and confirm addition to project GIS;

No	Issue	Management commitment
		• Advise NHC and request written permission to remove findings from work area; and • Recovery, packaging and labelling of findings for transfer to National Museum. In the event of discovering human remains: • Actions as above; • Field inspection by archaeologist to confirm that remains are human; and • Advise and liaise with NHC and Police.
2	Training	All workers (temporary and permanent) should be given training on the chance find procedure.

Table 11: Action Plan – Social and Economic Management Plan

Objective:

The objective of the management measures is to enhance the positive impacts associated with job creation and investment.

No	Issue	Management commitment
These commitments apply to operation phase		
1	Enhance positive socio-economic impacts	Local people must be preferentially selected to encourage social growth and development in the region and Namibia as a country.
		Management is urged to begin local selection and provide technical training as soon as possible to enable local people to compete for the lower skilled jobs and upskill themselves in anticipation of the proposed project.
		Management should work closely with the Town Council to manage in-migration, and the effects thereof.

Table 12: Action Plan – Waste Mangement

Objective:

The objective of the management measure is to appropriately manage hazardous and general waste.

No	Issue	Management commitment
These commitments apply to construction phase		
1	Waste Management	Refer to operations phase for general waste handling and management requirements.
		Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at a licensed hazardous waste disposal facility (Kupferberg).
		Hydrocarbon contaminated materials (soils, rags, containers, filters etc.) are considered hazardous waste and will be handled and disposed of accordingly.
These commitments apply to operation phase		
2	Waste Management	Ensure proper removal of general waste from site and disposal at licensed disposal site. Obtain records of safe disposal.
3		Hazardous waste will be separated from non-hazardous waste and will be stored and disposed of separately.
4		Recycling will be promoted on site.
5		Bins with labels according to waste type, and with lids in order to prevent wind-blown litter, will be provided at strategic locations through the site and will be emptied regularly in order to ensure no overflows.
6		No litter will be permitted on site.
7		No waste will be disposed of on site. Waste will be transferred to the Oranjemund Municipal landfill site.
8		Hydrocarbon contaminated materials (soils, rags, containers, filters etc.) are considered hazardous waste and will be handled and disposed of accordingly.
9		Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at a licenced hazardous waste disposal facility.

4 PARTIES RESPONSIBLE FOR THE IMPLEMENTATION OF THE EMP

This section describes the roles and responsibilities for implementing the different parts of the environmental management plan (EMP).

4.1 Supervisor

The Supervisor has overall responsibility for environmental management and safety during the operation process and shall oversee the implementation of the EMP.

The Supervisor's responsibilities relating to compliance with this EMP:

- Regular inspections of compliance to this EMP and any other relevant legal requirements.
- Regular correspondence with the DEA on environmental issues and incidents.
- Conduct environmental awareness training during induction training and on an ad hoc basis thereafter to all workers.
- Ensure compliance to all rules
- Ensure that staff is controlled through the implementation of appropriate security measures.
- Carefully manage the handling of hydrocarbons and other hazardous materials.
- Monitor for excessive dust and noise levels and implement control measures if necessary.
- Report incidences to the DEA.
- Implement a waste management strategy.
- Monitoring and maintenance of equipment and machinery.
- Implement an environmental awareness plan.
- Implementation of first-aid procedures.

5 TRAINING AND AWARENESS

The purpose of the job specific environmental awareness training is to ensure that employees/all staff are equipped to implement the actions committed to in the EMP. The staff involved in operations will receive training regarding the requirements of this EMP.

Four main forms of training will be provided on the premises:

- Site induction
- Environmental management training – general and targeted

The training will generally be prepared by the Supervisor (or the Environmental Representative).

The following will be done to ensure all employees, contractors, suppliers and visitors receive the appropriate training/awareness:

5.1 Environmental Site Induction

All new members of staff receive a corporate Environmental Induction along with the obligatory Health & Safety induction. The induction gives a general overview of the environmental challenges faced by the project, how we are managing them, and general tips for reducing our impact in the workplace.

The main reason for environmental induction is to encourage new staff to be environmentally aware right from the beginning of their employment. This will ensure that environmental initiatives are successful by eliminating bad habits from the start.

Before working on site, all personnel and sub-contractors will undertake a site induction incorporating environmental requirements. The induction will address a range of environmental awareness issues specific to the construction process of the project.

As a minimum, training shall include:

- Explanation on the importance of complying with the EMP and environmental implications should the EMP not be effectively implemented.
- Explanation of the site rules.
- Discussion of the potential environmental impacts of activities, recognition of environmental risks and how to control these risks.
- The benefits of improved personal performance, understanding of what to do in case of an environmental event or exposure.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out operational activities.
- Explanation of the requirements of the EMP and its specification.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.

5.2 Environmental Awareness training

Targeted environmental management training will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. This environmental training will aim to achieve a level of

awareness and competence appropriate to their assigned activities. This training will take place at the beginning of operations.