Environmental Management Plan Report for the Zambezi Regional Council's Proposed Construction of an Oxidation Pond, Located in Located in Kongola Settlement, Zambezi Region, Namibia.

February 2022

Final Report

CONSULTANT'S EXPERTISE

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by the Zambezi Regional Council 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 six years of relevant experience in conducting/managing Environmental Impact Assessments (EIAs), Socio-Economic Impact Assessments (SIA) and compiling Environmental Management Plans (EMPs) in Namibia. Immanuel is certified as an environmental practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

DECLARATION OF INDEPENDENCE AND DISCLAIMER

The consultant herewith declare that this report represents an independent, objective assessment of the environmental impacts associated with the activities of the proposed Construction of a Dam on the request of the Zambezi Regional Council.

I.N.K has prepared this report based on an agreed scope of work and acts in all professional matters as an independent environmental consultant to the Zambezi Regional Council and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession.

The information, statements and commentary contained in this Report have been prepared by I.N.K from information provided by the Zambezi Regional Council and from discussions held with stakeholders. I.N.K does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the party that provided the information or any conclusions reached. I.N.K has based this Report on information received or obtained, on the basis that such information is accurate and, where it is represented to I.N.K as such, complete.

I.N.K is not responsible and will not be liable to any other person or organisation for or in relation to any matter dealt within this report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in this report (including without limitation matters arising from any negligent act or omission of I.N.K or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in this report). This report must not be altered or added to without the prior written consent of I.N.K.

TABLE OF CONTENTS

LIST OF TABLES

1 INTRODUCTION

1.1 Introduction to the Proposed Project

Zambezi Regional Council intends on obtaining an Environmental Clearance Certificate (ECC) for the construction of an oxidation pond. The aims and objectives of the project is to find an alternative/solution to the current practice of unregulated and informal disposal of wastewater in the Kongola settlement.

The proposed project is located in Kongola Settlement, approximately 110 km east of Katima Mulilo town, Zambezi Region, Namibia. The site for the oxidation ponds is located ±3 km north east of Kongola Settlement on a currently undisturbed piece of land. Two preliminary sites for the oxidation ponds have been identified (refer to Figure 1). The EIA process will identify the best suitable location, from an environmental perspective.

Oxidation pond or lagoon or water stabilization pond is a secondary wastewater treatment that treats waste or sewage coming from industries, residential areas, etc. It uses microorganisms like bacteria, algae and light energy (sunlight) to stabilize the wastewater.

The aim of the project is to treat polluted water or wastewater by removing impurities (pollutants) so that the improved water quality can either be re-used for a certain intended purpose such as irrigation for instance or be discharged back into the environment upon meeting the set environmental standards. The treatment is therefore done to ensure that the polluted water (wastewater) is not a threat to both the biophysical and social environment either in a short or long-term. Not only to prevent to reduce the environmental threat, but also to reduce the loss of usable water in this wastewater.

Prior to commencement of the construction and operation activities, 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.

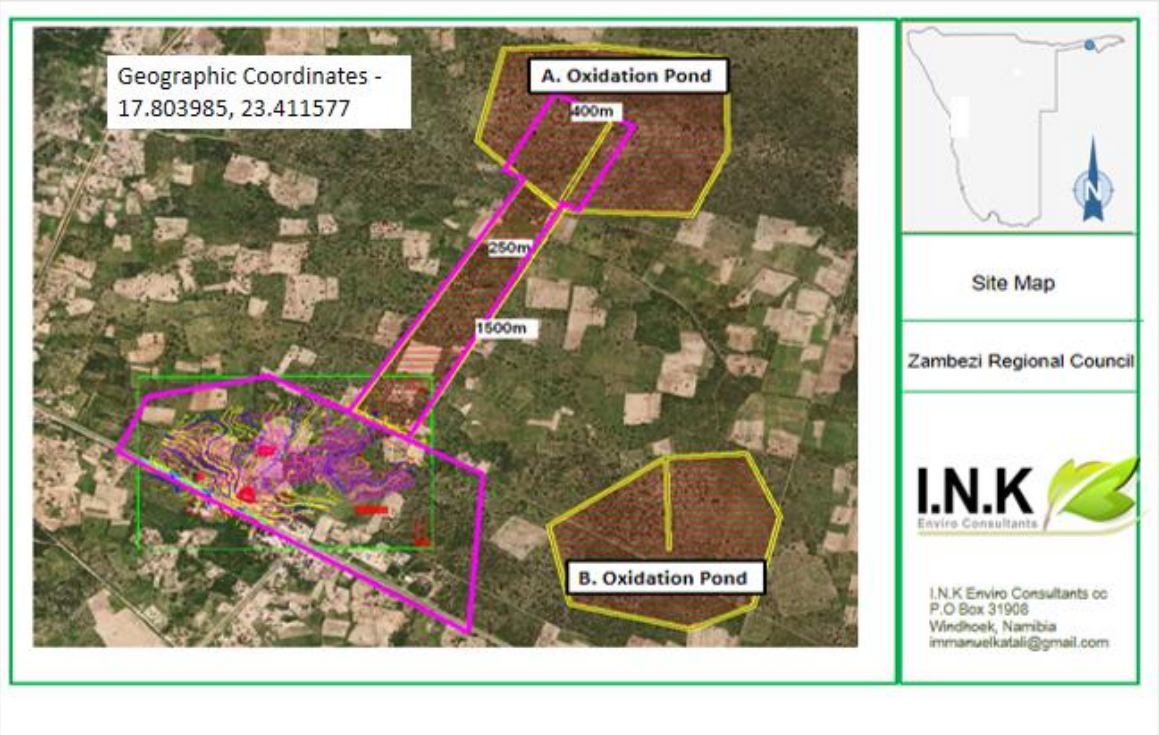

Figure 1: Locality Map for the Proposed Oxidation Pond

1.2 Details of the Persons who compiled this report

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by the Zambezi Regional Council to undertake the environmental impact assessment and related processes.

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).

2 ENVIRONMENTAL LAWS AND POLICY

2.1 Environmental Management Act No. 7 of 2007

Environmental Management Act No. 7 of 2007 and its 2012 EIA Regulations aims to ensure that the potential impacts of the development on the environment are considered carefully and in good time; that all interested and affected parties have an opportunity to participate in the environmental assessment processes and that the findings of the environmental assessments are fully considered before any decisions are made about activities which might affect the environment. The Act aims at promoting sustainable management of the environment and use of natural resources. The Environmental Management Act (EMA) is broad; it regulates land use development through environmental clearance certification and/or Environmental Impact Assessments.

The Act provides for the clearance certification for '' 2.1 The construction of facilities for waste sites, treatment of waste and disposal of waste and 8.6 The construction of industrial and domestic wastewater treatment plants and related pipeline systems''.

2.2 Water Act No. 54 of 1956

The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force:

• Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duly of care to prevent pollution (S3 (k)).

• Provides for control and protection of groundwater (S66 (1), (d (ii)).

• Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). Implication for the proposed project: The project will involve the treatment of wastewater that pose a risk to water resources (pollution), therefore the Proponent will need to ensure that they are in possession of the required licenses and permits from the DWA

2.3 Water Resources Management Act No. 11 of 2013 Act

This act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to: Ensure that the water resources of Namibia are managed, developed, used, conserved, and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (Section 68). Implication or responsibility to Water Acts: The protection (both quality and quantity/abstraction) of water resources should be a priority. Therefore:

• The Proponent should ensure that the permit/license for effluent (wastewater) discharge into the environment (including its use for irrigation) is applied for from the Department of Water Affairs' Water Environment Division of the Ministry of Agriculture, Water and Land Reform.

2.4 Codes of Practice including Vol. 6 – Wastewater Re-Use of July 2012

The project is subject to the Regulations listed in the DWA' Codes of Practice. The recent Code of Practice: Volume 6 of July 2012 contains the following guidelines on the:

• Treatment of wastewater (grey water, domestic wastewater, and industrial effluents)

• Precautions for wastewater re-use systems

• Specific applications for re-use of wastewater (mining, industrial & food processing, agricultural reuse, gardening & landscape re-use, aquacultural re-use and other uses)

• Disposal and discharge of treated effluent into nature.

2.5 Other Applicable Laws and Policies

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.

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

Table 1: 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**
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	X	X	X	X	X	X	X	X	X	X	X
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976		X	X					X		X	X

1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation	X	X	X	X	X	X	X	X	X		X
2003	Agricultural (Commercial) Land Reform Amendment Act										X	
2004	National Heritage Act									X		
2013	Water Resources Management Act, 11 of 2013	X			X						X	

3 ENVIRONMENTAL ACTION PLANS

The management measures proposed to mitigate the potential impacts 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 together with timeframes for each action. The action plans include the timeframes and frequency for implementing the mitigation measures as well as identifying the responsible party.

Table 3- 1: action plan – Hydrocarbon and associated spills Management

Objective:

The objective of the mitigation measures is to handle and store hydrocarbons in such a way as to prevent spills. Where spills do occur, to ensure the spill is contained and the contamination cleaned-up and contaminated material disposed of responsibly.

Activities / facilities	Management and mitigation measures	Action plan	
		Frequency / target date	Responsible parties
Storage of hydrocarbons (i.e. diesel bowser,)	• Regular inspection of hazardous storage tanks for leakages and wear is required. • Regular environmental awareness should include potential risks associated with hydrocarbons.	Throughout the construction activity	Construction contractor/ supervisor
Vehicles, machinery, and equipment	• Vehicles, machinery and equipment shall be kept in good working condition to ensure they do not leak oil/diesel. • Vehicles and machinery will be serviced off site as far as possible. However, in the event where machinery needs to be repaired/serviced on site all care shall be taken to prevent spillage of oil/diesel by performing the work on impermeable surfaces or proper placement of drip trays. • All used parts from vehicles and machinery (which may include, but not limited to, oil filter, pipes, rags, cans) will be collected and removed from site and disposed of in an appropriate manner. • All refueling of vehicles will take place on impermeable surfaces • Pollution will be prevented through basic infrastructure design and through maintenance of equipment in the nearest towns and not in the proposed sites.	Throughout the construction activity	Construction contractor/ supervisor
General (spills)	• Any spills will be contained and cleaned up immediately • Spill kits will be readily available on site. Employees and/or contractors will be shown how to use the spill kits to enable containment and remediation of pollution incidents. • The contractor will establish environmental awareness to employees • Soil contaminated with hydrocarbons shall be excavated and stored in plastic bags inside a designated wheelie bin and transported for disposal	Throughout the construction activity	Construction contractor/ supervisor

	at the nearest disposal facilities in the towns.		

Table 3- 2: action plan – Waste management

Objective:

The objective of the management measures is to ensure proper storage, removal, transportation and disposal/recycling of hazardous and non-hazardous (i.e. domestic) waste.

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
General	• Waste shall be separated and recycled / re-used where possible. • No burning or burying of waste material will be allowed on the construction site. • Contractors will be shown the importance of correct waste disposal as well as waste minimisation and recycling.	Throughout the construction and operation activity	Construction contractor/ supervisor
Collection and storage of waste	• Suitable receptacles with lids for waste disposal will be required at all sites. • Ensure animals do not have access to waste bins. All food scraps need to be removed from site on a daily basis. • If rubbish containers are used, ensure these can be sealed from wild animals or strong wind and for during transport.		
Disposal of non-hazardous (domestic) waste	• Waste shall be transported a weekly basis from the site to the nearest disposal facility. No disposal of waste on site and no burning of waste.		
Recyclables	• Recyclable material shall be taken to an identified recycling company.		
Disposal Hazardous Waste	• Hazardous Waste (including hydrocarbon contaminated material/soil) will be disposed off at the nearest hazardous waste disposal facility.		
Medical waste from First Aid Kit	• Medical waste where appropriate shall be disposed of at the medical waste facility.		
Disposal records (domestic and industrial)	• Written evidence of safe disposal of waste will be kept.		

Table 3- 3: action plan – biodiversity & land use

Objective:

The objective of the mitigation measures is to limit the destruction and general disturbance of biodiversity.

Activities / facilities	Technical and management options	Action plan	
		Frequency /	Responsible

		target date	parties
Vehicles and machinery	• Vehicles will follow designated access routes.	Throughout the construction activity	Construction contractor/ supervisor
Site preparation for construction	• Any additional excavations made in the area should be backfilled. • Trees on sites shall be conserved. This is best achieved through the demarcation of large trees on the site layout plan	Throughout the construction activity	Construction contractor/ supervisor
General	• The contractor will implement a zero tolerance policy with regards to the killing/poaching or collecting of any biodiversity. • Contractors will be shown the value of biodiversity and the need to conserve the species and systems that occur within the project area. • No open fires will be permitted on site. • Maintain machinery and equipment to prevent excessive noise. • Appropriate ablution facilities will be provided for contractor's workforce. These facilities must be maintained. • No indigenous hardwoods are to be used for any form of construction. • Speed limits will be enforced to promote road safety, and prevent corrugation and road kills. • Include these rules in the environmental awareness programme.	Throughout the construction activity	Construction contractor/ supervisor

Table 3- 4: ACTION PLAN – WATER QUALITY

Objective:

The objective of the mitigation measures is to prevent negative impacts associated with water quality

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
Mobile Ablution facilities	• Contractor must provide toilet facilities for the employees at all construction sites. • Contractor should ensure that toilets are working properly and are clean, so they do not pollute the surrounding environment or create hygiene problems. • All sewerage from the toilets will be pumped out by a contractor when required for disposal at a permitted sewerage facility. • Personnel may not relieve themselves in the surrounding bush • Mobile ablution facilities should be placed in such a way they do not get blown by windy conditions in the area.	Throughout the construction activity	Construction contractor/ supervisor
Water use	• Obtain water from the Kongola Settlement. • No pollution of the surface water will be allowed (i.e. discharge same quality water only). • All run off materials such as hydrocarbons, wastewater and other potential contaminants should be contained on site in designated containers and disposed of in accordance with municipal wastewater discharge standards, so that they do not reach to	Throughout the construction and operation activity	Construction contractor/ supervisor

	water systems.		
Oxidation Pond Water Management	• Stormwater management plans (discharge points) should be designed and implemented on site to prevent the on potential contaminated run-off from reaching surface water resources. • The ponds should be equipped with a robust wastewater flow monitoring system ensure that the first sign of overflow is detected and addressed in time (for flow and capacity monitoring in the ponds). • The ponds should be maintained frequently to ensure that no overflow leaves the ponds undetected. • Sediments removal from the ponds should be done at least once a year to prevent overflow due to the thick sediments settling at the bottom of the ponds	Throughout the operation activity	supervisor
Contamination of groundwater / surface water	• Refer to "Hydrocarbon and associated spills Management Action plan". • All run off materials such as hydrocarbons, wastewater and other potential contaminants should be contained on site in designated containers and disposed of in accordance with municipal wastewater discharge standards, so that they do not reach to groundwater systems. • The base of the ponds should be properly lined with an approved and appropriate liner material to ensure that there will be no direct contact between wastewater in the ponds and groundwater through leakages due to unlined base or liner failure and poor installation. • Areas where hydrocarbons will be utilized, the surface should be covered with a plastic impermeable plastic liner to prevent the spillage on the soils and eventual infiltration into the ground. • Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated during construction works. • All hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites in accordance with the discharge standards. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the groundwater quality. • In cases of accidental fuel or oil spills on the soils from site vehicles, machinery and equipment, the polluted soil should be removed immediately and put in a designate waste type container for later disposal as per the preceding bullet point. The removed polluted soil should either be completely disposed of or cleaned and returned to where it was taken from on site or can be replaced with a cleaner soil. This is to ensure that the pollutants contained int the soil does not infiltrate into the site soils and eventually reach to groundwater. • Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching groundwater bodies. The impact would be more on groundwater (aquifers) since the construction works will be done in the dry months, thus there would be no rain to trigger (polluted) runoff to surface water bodies. • Stormwater management plans (discharge points) should be designed and implemented on site to prevent the potential	Throughout the construction activity	Construction contractor/ supervisor

	contaminated run-off from reaching surface water resources, and or eventual infiltration into groundwater. • The effluent / wastewater containers or ponds should be lined to prevent dissolving waste from leaching into the ground, and potentially into groundwater systems.		

Table 3- 5: **ACTION PLAN –ARCHAEOLOGY SITES / HUMAN REMAINS**

Objective:

The objective of the mitigation measures is to prevent negative impacts associated with archaeology.

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
Chance archaeological find of any (i.e. human burial/remains fossils, chipped stone age tools, pre-modern artefacts (bone, wood, metal, glass and/or ceramic), etc.)	• Preserve the site by demarcating the site with flagging / danger tape, and cease any work in the vicinity of the site. • Notify the Project Manager. • Inform the National Heritage Council (NHC) of the find and take further instructions. • Actions recommended by the appropriate Authorities may include an archaeological assessment, site preservation, removal of fossils or artefacts.	In the event of a chance find	Construction contractor/ supervisor

Table 3- 6: **ACTION PLAN –ARCHAEOLOGY SITES / HUMAN REMAINS**

Objective:

The objective of the mitigation measures is to prevent negative impacts associated with archaeology.

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
Odour	• The Proponent should ensure that the ponds' machinery and equipment are designed in such a way or contain technologies that can help to control or minimize odour. An example of such technology includes odour controlling caps at the ponds. These caps will be incorporated into the ponds' design and installed during construction. • Covering the problem: Many wastewater treatment facilities choose to seal the source of odour (a tank, basin, or lagoon) with an industrial-grade cover, thereby preventing the diffusion of odour vapours. Covering a tank or lagoon to control odours is a rare example of when covering up a problem makes perfect sense. • With regards to persistent odour issue, should the residents still express grievances over odour after the demolition of current ponds and construction of new ponds, the Kongola settlement office should consider consulting with the affected residents to weigh the option of relocating them further from the ponds, rezone the area to industrial (from residential) and set up a no-go zone (buffer line) for future house establishment.	Throughout the operation activity	supervisor

Table 3- 6: **ACTION PLAN – SOCIAL ISSUES & TRAINING**

Objective:

The objective of the mitigation measures is to prevent negative social impacts associated the contractor's workforce on site.

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
Employees (contractors) – social issues	• Have zero tolerance to alcohol in the workplace. • Establish a HIV / AIDS / TB workplace policy and wellness programme as part of social responsibility for the contractor. • A First Aid Kit should be available at all times during the construction process.	Throughout the construction activity	Construction contractor/ supervisor
Training & Awareness	Rules should be communicated to employees/ contractors before any construction.	Prior to any activities taking place Throughout the	Construction contractor/ supervisor

		construction activity	

Table 3- 7: **ACTION PLAN – REHABILITATION**

Objective:

The objective of the measures is to rehabilitate the construction sites to as close an approximation of the pristine state as is technically, financially and reasonably possible.

Activities / facilities	Technical and management options	Action plan	
		Frequency / target date	Responsible parties
Rehabilitation	• All construction sites should be photographed (1) before commencement, (2) after completion and (3) after rehabilitation of the activities. At completion of the construction activity and in consultation with MEFT, the following rehabilitation works is recommended: • All unused equipment and material will be removed from all sites; • All litter from the construction sites will be taken to an appropriate disposal site. • All debris, scrap metal, etc. will be removed. • All small ditches/ trenches will be covered and contoured. • Impacted footprints outside are to be raked and/or ploughed to encourage re-vegetation. • Inspect to ensure rehabilitation measures are implemented	Before, during and after activities After construction activities at each of the sites.	Construction contractor/ supervisor

1. 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).

3.2 Site Manager/ Supervisor

The Site Manager has overall responsibility for environmental management and safety during the construction process and shall oversee the implementation of the EMP.

The Site Manager's responsibilities relating to compliance with this EMP:

- Regular inspections and auditing of compliance to this EMP and any other relevant legal requirements.
- Regular correspondence 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 this EMP
- 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, noise and biodiversity losses and implement control measures if necessary.
- Report incidences
- Implement a waste management strategy.
- Monitoring and maintenance of equipment and machinery.
- Ensure the provision of adequate sanitation facilities.
- Implement an environmental awareness plan.
- Implementation of first-aid procedures.
- Control of traffic safety and access route conditions.

3.3 ENVIRONMENTAL REPRESENTATIVE

The Site Manager might nominate an Environmental Representative to assist with overseeing each of the sites and implementing of the relevant EMP commitments.

2. 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.

Two main forms of training will be provided on site:

- Site induction
- Environmental management training – general and targeted

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

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

3.4 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 all sites, 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 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.

3.5 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 construction activity and a refresher towards the end of the construction project.