













ECC DOCUMENT CONTROL - ECC-96-239-REP-11-B

# **ENVIRONMENTAL MANAGEMENT PLAN**

**ERONGO ROCKS ADVENTURE LODGE IN OMARURU, ERONGO REGION** 

PREPARED FOR



SEPTEMBER 2019



#### TITLE AND APPROVAL PAGE

Project Name: Environmental Management Plan for Erongo Rocks Adventure Lodge in Omaruru,

**Erongo Region** 

**Project Number:** ECC-96-239-REP-12-B

Client Name: Southern Cross Adventure Lodges (Pty) Ltd

Ministry Reference: NA

**Status of Report:** Final for Submission

Date of issue: September 2019

Review Period NA

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# **DEFINITIONS AND ABBREVIATIONS**

ECC Environmental Compliance Consultancy
EIA Environmental Impact Assessment
EMA Environmental Management Act
EMP Environmental Management Plan
EPL Exclusive Prospecting Licence

MET Ministry of Environment and Tourism

MME Ministry of Mines and Energy

PM Project Manager

MSDS Material Safety Data Sheet
PPE Personal Protective Equipment

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#### 1. INTRODUCTION

#### 1.1. PROJECT BACKGROUND

Environmental Compliance Consultancy (ECC) has compiled this Environmental Management Plan (EMP) in terms of the Environmental Management Act, 2007 on behalf of Southern Cross Adventure Lodges (Pty) Ltd.

Southern Cross Adventure Lodges (Pty) Ltd proposes to undertake construction activities for the development of Erongo Rock Adventure Lodge in the Erongo Region. The proposed development consists of a 15 en-suite, 5 self-catering units and 5 camping units lodge. The area has significant tourism potential and expose tourists to the cultural experience in central-northern Namibia. The proposed development will also generate income for the indigenous community and open-up future business frontiers. Agreements have been signed, finances are in place and contractors have been appointed for the lodge construction. The newly formed venture is designed to further spread financial, social and environmental benefits that eco-tourism can bring to previously marginalized or disadvantaged communities.

The Erongo Rock Adventure Lodge is located approximately 20 km south of the C36 road and 1km into the D2315 road in the Erongo Region (FIGURE 1).

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15°30'0"E EPSG 4326 21"28'50"S WGS 84 Zone 33 Erongo Rocks Adventure Lodge Legend Towns and Settlements Ai Aiba Rock Painting Lodge Erongo Rocks Adventure Lodge Ai Aiba Rock Painting Lodge · · · Tracks --- District Road Regional Boundary 21°31'40"S National Boundary Omandumba West Farm (No 137) Erongo Rocks Adventure Lodge 21°34'30"S-Locality Map **ECC Document Reference** 6 ECC-96-239 15°35'40"E Map Produced 15.07.2019

FIGURE 1 - LOCALITY MAP OF ERONGO ROCK ADVENTURE LODGE

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#### 1.2. Environmental Regulatory Requirements

The proposed project is considered as a listed activity as stipulated in the Environmental Management Act7 of 2007 and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011). Therefore, an application for an Environmental Clearance Certificate is to be submitted. An Environmental Scoping Report and Environmental Management Plan (EMP) are required to be submitted as part of the application process, as well as to support the decision-making process from the competent authority. This report presents the EMP and has been undertaken in terms of the requirements of the Environmental Management Act, 2007 and its Regulations.

#### 1.3. THE PROPONENT OF THE PROPOSED PROJECT

The proponent of the project is Southern Cross Adventure Lodges (Pty) Ltd are set out in TABLE 1 below.

#### **TABLE 1 - PROPONENT DETAILS**

CONTACT	POSTAL ADDRESS	EMAIL ADDRESS	TELEPHONE	WEBSITE
Jochen Beckert	P O Box 5633, Windhoek	jochen@absoluttours.com	+264 61 308 675	www.absoluttours.com

#### 1.4. PURPOSE AND SCOPE OF THIS REPORT

This Environmental Management Plan (EMP) is a site-specific plan developed to ensure that appropriate environmental management practices are followed to minimised potential environmental risks and impacts.

This EMP is a live document and shall be reviewed at predetermined intervals, and/or updated to reflect material changes to the operations and to allow for continual improvement. All personnel working on the lodge are legally required to comply with the standards set out in this EMP.

The scope of this EMP includes all operations of the Erongo Rock Adventure Lodge. The proponent shall be responsible for each phase of the project and the implementation of this EMP throughout the proposed development life cycle.

#### 1.5. Management of this EMP

The proponent, Southern Cross Adventure Lodges (Pty) Ltd will hold the Environmental Clearance Certificate for the proposed project and shall be responsible for the implementation and management of this EMP. Prior to the construction activities commencing, this EMP shall be reviewed, amended as required and approved ready for implementation. The implementation and management of this EMP and thus the monitoring of compliance shall be undertaken through daily duties and activities and monthly inspections.

This EMP shall be circulated to all contractors and shall be made available on the Environmental Compliance Consultancy's (ECC) website.

#### 1.6. LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP

This EMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the health and safety management plan to be developed by the proponent.

Where there is any conflict between the provisions of this EMP and any contractor's obligations under their respective contracts, including statutory requirements (such as licences, project approval conditions, permits, standards, guidelines and relevant laws), the contract and statutory requirements are to take precedence.

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The information contained in this EMP has been based on the project description as provided in the Environmental Scoping Report. Where the design or construction methods alter, this EMP may require updating and potential further assessment undertaken.

#### 1.7. ENVIRONMENTAL CONSULTANCY

ECC, a Namibian consultancy (registration number Close Corporation 2013/11401), has prepared this EMP on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa, in both the public and private sectors. ECC is independent of the proponent and has no vested or financial interest in the proposed project, except for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this document should be forwarded by email or post to the following address:

**Environmental Compliance Consultancy** 

PO BOX 91193

Klein Windhoek, Namibia Tel: +264 81 669 7608

Email: info@eccenvironmental.com



#### 2. ENVIRONMENTAL MANAGEMENT FRAMEWORK

This EMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. The EMP also indicates monitoring and reporting guidelines and sets responsibilities for those carrying out management and mitigation measures.

#### 2.1. OBJECTIVES AND TARGETS

Environmental protection is the responsibility of management and if the management is environmentally aware, it motivates all employees and their associated guests to think and act in a more environmentally responsible manner. Environmental objectives and targets have been developed so that activities of Erongo Rock Adventure Lodge can minimise potential impacts on the environment, as far as reasonably practicable.

Environmental objectives for the project are as follows:

- Zero pollution incidents
- Minimal vegetation clearing and earthworks
- Protect local flora and fauna
- Use natural resources effectively and efficiently, and
- Appropriate waste management and pollution control

### 2.2. Organisational Structure, Roles and Responsibilities

The proponent shall be responsible for:

- Ensuring all members involved in the operations of Erongo Rock Adventure Lodge, comply with the procedures set out in this EMP.
- Ensuring that all personnel are provided with adequate training, supervision and instruction to fulfil this requirement.
- Ensuring that any personnel allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.
- The proponent shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above.

#### **TABLE 2 – KEY ROLES AND RESPONSIBILITIES**

ROLE	RESPONSIBILITY & DUTIES
Proponent	Responsible for ensuring compliance with this EMP
	Ensuring employees understand and comply with the requirements of this EMP
	<ul> <li>Ensuring that all personnel are provided with enough training, supervision and instructions to fulfil this requirement</li> </ul>
	<ul> <li>Ensuring compliance with this EMP including overseeing the day to day activities during operations, and routine and non-routine maintenance works during operations</li> </ul>
	Ensure the environmental policy is communicated to all personnel
	<ul> <li>Responsible for providing the required resources (including financial and technical) to complete any required tasks</li> </ul>
	Responsible for the management, maintenance and revisions of this EMP
	Maintain a community issues and concern register, and keep records of complaints
	Maintain an up to date register(s) of employees who have completed the site induction
	Ensuring that best environmental practice is undertaken throughout the operations of the lodge
	Report any non-compliance or accidents to the relevant authority

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ROLE	RESPONSIBILITY & DUTIES
Employees /	Responsible for being compliant with and adhering to this EMP at all times
Contractor employees	<ul> <li>Ensuring they have undertaken a site induction and are conversant with the requirements of this EMP</li> </ul>
. ,	• Reporting of any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the proponent.

#### 2.3. Contractors

Any contractors hired during the construction activities and accessory works for the project duration shall be compliant with this EMP and shall be responsible for the following:

- Undertaking activities in accordance with this EMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements
- Implementing appropriate environmental and safety management measures
- Reporting environmental issues, including actual or potential environmental incidents and hazards, to the proponent, and
- Ensuring appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported by employees and subcontractors.

#### 2.4. EMPLOYMENT

The proponent and all contractors shall comply with the requirements of the Republic of Namibia Regulations for Labour, Health and Safety, and any amendments to these regulations. The following shall be complied with:

- In liaison with local, regional and traditional authorities, the proponent shall ensure that local people have access to information about job opportunities and are considered first for construction/maintenance contract employment positions
- The number of job opportunities shall be made known together with the associated skills and qualifications.
   The maximum length of time the job is likely to last for shall be indicated
- Foreign workers with no proof of permanent legal residence shall not be hired, and
- Every effort shall be made to recruit from the pool of unemployed workers living in the surrounding area.

#### 2.5. REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the proposed project has been completed to identify all the commitments and agreements made within the environmental scoping report. A list of environmental commitments and risks has been produced in TABLE 3, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the construction phase.



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#### TABLE 3- ENVIRONMENTAL RISKS AND ISSUES, MITIGATION AND MONITORING MEASURES

ASPECT	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Water management and wastewater	Effects on natural resources	<ul> <li>Minimise the consumption of water for construction</li> <li>Recycle wastewater, where possible</li> <li>Install devices to prevent spills and overfills, e.g. shutoff devices for large volume tanks (e.g. &gt; than 2000lts)</li> <li>Install an impermeable hardstand in areas of high-risk contamination to prevent ground infiltration by pollutants</li> <li>Segregation of wastewater (domestic and industrial effluent)</li> <li>Monitoring of wastewater discharges should be conducted on a regular basis (quarterly)</li> </ul>	<ul> <li>Daily inspection of operations</li> </ul>	<ul><li>Manager, and</li><li>Employees</li></ul>
Waste management	Environmental pollution (littering and poor storage of waste)	<ul> <li>Implement a waste management plan covering all aspects of waste generated on site</li> <li>Training and toolbox talks</li> <li>Ensure high standards of housekeeping across site</li> <li>Implement the waste management hierarchy across site: Avoid, reuse, recycle, then disposal</li> <li>Waste storage areas shall always be kept clean and tidy</li> <li>Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse.</li> </ul>	<ul><li>Daily observations</li><li>Weekly inspections</li></ul>	<ul><li>Manager, and</li><li>Employees</li></ul>
Hazardous materials	Inadequate control or accidental releases of hazardous substances on site or in transit	<ul> <li>Storage         <ul> <li>Label chemicals appropriately</li> <li>Chemicals with different hazard symbols should not be stored together - clear guidance on the compatibility of different chemicals can be obtained from the Materials Safety Data Sheets (MSDS) which should be readily available</li> <li>Store chemicals in a dedicated, enclosed and secure facility with a roof and a paved/concrete floor. Chemical tanks should be completely contained within secondary containment such as bunding</li> <li>Consider feasibility of substitution of hazardous chemicals with less hazardous alternatives.</li> </ul> </li> <li>Fire risk</li> <li>Control and reduce the potential risk of fire by segregating and safe</li> </ul>	<ul> <li>Daily observations</li> <li>Weekly inspections</li> </ul>	<ul><li>Manager, and</li><li>Employees</li></ul>

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ASPECT	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		<ul> <li>storage of materials, and</li> <li>Avoid potential sources of ignition by prohibiting smoking in and around facilities, and</li> <li>Fire extinguishers should always be at designated areas and should be inspected regularly.</li> </ul>		
Energy	Air Emissions- reduced air quality due to release of fumes, gases in the atmosphere	<ul> <li>All technical equipment must be maintained regularly &amp; inspected documented, and</li> <li>Install low-energy light and/or energy efficiency bulbs in suitable places.</li> </ul>	<ul><li>Weekly observations</li><li>Monthly monitoring</li></ul>	<ul><li>Manager</li><li>Employees</li></ul>
Noise	Disturbance to neighbour	<ul> <li>Noise restrictions to be put in place in the event of excessive noise complaints.</li> </ul>	<ul><li>Complaints register</li></ul>	- Manager
Housekeeping	Spill of chemicals	<ul> <li>All the chemicals should be kept secure and stored corrected</li> <li>All product descriptions and specifications should be made available for chemicals including the Material Safety Data Sheet (MSDS).</li> <li>All chemicals must be disposed of appropriately</li> </ul>	<ul><li>Daily observation</li></ul>	– Manager

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#### 3. COMMUNICATION AND TRAINING

In order to ensure potential risks and impacts are minimised it is vital that personnel are appropriately informed and trained to ensure risks are mitigated. It is also important that regular effective communications are maintained with stakeholders (including traditional authorities, local and regional government) and made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training in relation to the EMP.

#### 3.1. COMMUNICATIONS

The proponent shall communicate environmental issues to all personnel through the following means (as and when required):

- Ensure all personal are afforded the opportunity to attend an environmental site induction that sets out their requirements in relation to this EMP
- Ensuring audits and inspections are undertaken regularly on a risk-based schedule
- Toolbox talks, including instruction on incident response procedures
- Deliver project specific environmental briefings where required
- Ensure all personnel have access to the EMP
- Ensure operators of key activities and environmentally sensitive operations are briefed and understand their requirements.

#### 3.2. Environmental Emergency and Response

#### **TABLE 443 - EMERGENCY CONTACT DETAILS**

TOWN	AMBULANCE	POLICE	WATER AND SEWAGE	HOSPITAL SERVICES
Erongo-Omaruru	+264 (64) 57-0037	+264 (64) 1-0111	+264 (64) 57-0180	+264 (64) 57-0037

For any other significant environmental incidents, all relevant local and regional government (including traditional authorities, line ministries, I&AP) should be contacted as required and the MET office informed of the incident (telephone +264 61 284 2111, Windhoek). All correspondence with MET should be undertaken by the manager.

For the clean-up of smaller chemical spills, the relevant Material Safety Data Sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic chemical spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

#### 3.3. Complaints Handling and Recording

The proponent shall maintain a complaint's register (example attached as Appendix D) that will detail the name and contact details of the complainant, date and time of the complaint, nature of complaint, action taken to resolve issues, and date of complaint handover. The proponent shall be responsible for nominating the correct personnel to coordinate and resolve the issue.

Any complaints received verbally shall be recorded as per above and the information shall be given to the proponent who is overall responsible for the management of complaints and will provide a written response to the complainant.

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The workforce shall be informed about the complaints register, its location and the person responsible, in order to refer residents or the general public who wish to lodge a complaint. The complainant shall be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register.

The complaints register shall be kept for the lodge and will be available for government or public review upon request.

#### 3.4. Training and Awareness

All employees of the proponent shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training and experience.

All personnel shall be inducted with specific environment and social awareness training. The environment and social awareness training shall ensure that personnel are familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures. The proponent shall ensure a register of completed training is maintained. The site induction should include, but not limited to the following:

- A general site-specific induction that outlines:
  - What is meant by "environment" and the EMP
  - What are the environmental risks of this facility
  - o Why the environment needs to be protected and conserved
  - How operational activities can impact on the environment
  - O What can be done to mitigate against such impacts?
- The inductee's role and responsibilities with respect to implementing the EMP
- The site environmental rules
- Details of how to deal with, and who to contact, in the event of environmental problems should they occur
- The potential consequences of non-compliance with this EMP and relevant statutory requirements, and
- The role of responsible people for the project.

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# 4. INCIDENT REPORTING

The proponent must have an accident and incident reporting system that covers all applicable statutory requirements. The section below sets out the minimum requirements for incident reporting and should be used as a basis for incident reporting, in the event that no incident reporting system exists.

#### 4.1. MINOR INCIDENT OR "NEAR MISS"

Any incident or "near miss" involving the proponent, a nominated representative, any contractor, or its subcontractors or any third party's personnel, property, plant or equipment, must be

- 1) Orally reported to the Manager or the Managers nominated Representative:
  - a. Immediately and without delay
  - b. Regardless of whether or not injury to personnel has occurred
  - c. Or property or equipment has been damaged.
- 2) Written up and handed to the Manager or the Managers nominated Representative by the end of the shift. The written report should:
  - a. State all known facts and conditions at the time of the incident and
  - b. Includes a preliminary assessment of the most likely potential consequences of the incident under the current circumstances.

#### 4.2. SERIOUS INCIDENT

For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the Police or MET personnel (e.g. poaching). This requirement does not preclude immediate first aid being administered and the location being made safe.

#### 4.3. INCIDENT REPORT AND CLOSE OUT

The Manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

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# 5. COMPLIANCE AND ENFORCEMENT

#### 5.1. Environmental Inspections & Compliance Monitoring

Annual inspections and audits of the lodge will be managed and undertaken by the proponent. All infrastructure will be inspected to ensure the equipment are operating as per specification; no damage has been caused; and no leaks or spills have occurred. Any non-conformance shall be recorded, including the following details: brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action taken and any necessary follow up measures required.

#### 5.2. REPORTING

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issues, any faulty or malfunction of equipment that perform an environmental function or accident, is reported to the proponent.

#### 5.3. Non-compliance

Where it has been identified that work is not compliant with this EMP, the proponent shall ensure corrective actions are implemented so that the work returns to being compliant as soon as possible. In instances where the requirements of the EMP are not upheld, a non-conformance and corrective action notice shall be produced (refer to Appendix E). The Notice shall be generated by the safety health environmental coordinator during the inspections and the proponent shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

A non-compliance event / situation, for example, is considered if:

- There is evidence of contravention of this EMP and associated indicators or objectives
- The proponent has failed to comply with corrective or other instructions issued by an authority, or
- The proponent fails to respond to complaints from the public.

#### 5.4. DISCIPLINARY ACTION

This EMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties
- Legal action
- Monetary penalties imposed by the proponent on the contractor
- Withdrawal of licence/s, and
- Suspension of work.

The disciplinary action shall be determined according to the nature and extend of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

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### 6. ENVIRONMENTAL MANAGEMENT MEASURES

#### 6.1. WATER PERMITS AND LICENCE

The Water Act (1956) governs the use of water resources in Namibia and is the enforceable piece of legislation for water related matters. The Water Resources Management Act (2013), passed but pending regulations (not enforced) provides an improved framework for managing water resources based on the principles of integrated water resource management, while not enforced it is considered best practice to adhere to the stipulations while ensuring compliance to the Water Act of 1956 is also maintained

Should water not be sourced directly from the municipal water connections (or private borehole), a licence to abstract water is required in terms of the Water Act. The municipality is responsible for the reticulation and treatment of sewerage water discharged into the municipal sewerage system. The lodge is required to ensure that non-hazardous waste water is correctly connected into the appropriate waste water system and that no hazardous waste is disposed in the waste water system. The Water Act (1956) governs the use of water resources in Namibia and is the enforceable piece of legislation for water related matters.

#### 6.2. WASTEWATER DISCHARGE PERMIT

In the event that the lodge takes it upon itself to discharge effluent via another means the proponent must ensure that all documentation, permits and measures are in place before discharge occurs, including obtaining the relevant effluent discharge permit in terms of the Water Act to be applied for at the Ministry of Agriculture Water and Forestry.

In order to obtain an effluent wastewater permit, the proponent should have the following information and complete the application form contained in Appendix A:

- Specification of the treatment system (type of technology)
- Description of major activities resulting in effluent generation
- List of contaminants (analysis of effluent samples)
- Effluent quality
- Points of discharge
- Show the present average quantities of incoming water, recycled water, final outflow, and
- Where final effluent discharged.

A number of potential environmental impacts may occur during the operations of the lodge. Potential impacts are managed through individual management plans that have been developed to minimise these impacts and provide a management framework for the Proponent. A summary of each management plan is provided below:

- Surface and Ground Water Management Plan Surface water and Groundwater management measures
  including controls and measures to avoid contamination of water sources, as well as appropriate procedures
  to manage, minimise and mitigate the impacts of flood events and other natural disasters.
- Waste Management Plan Procedures for the appropriate management of waste materials.
- Spill Management Plan Preventative measures to minimise the potential for a spill and management measures should a spill occur.
- Air Quality Management Plan Air quality management measures to minimise the production of airborne dust and other gaseous emissions.

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#### 7. SURFACE AND GROUNDWATER MANAGEMENT PLAN

#### 7.1. Introduction

Chemical and waste spills must be contained so as not to contaminate the soil or groundwater. Any contact with groundwater must be treated with exceptional care and reported immediately, to minimize the potential for contamination of an aquifer. It is important to limit the potential for wastewater seepage to groundwater.

The proposed project is within the high risk flood prone area, suggesting an appropriate measure to minimise and mitigate impacts of flooding which could contribute indirectly to high risk of contracting waterborne diseases if wastewater is not properly managed.

This Surface and Groundwater Management Plan outlines appropriate surface and groundwater water management measures, monitoring programs and reporting procedures to be implemented.

#### 7.2. OBJECTIVES

This Surface and Groundwater Management Plan has been prepared to minimise potential impacts on surface and groundwater resulting from the operations of the lodge. It is important report any contact with or contamination of groundwater to the proponent as soon as possible.

#### 7.3. RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

Required to take all reasonable measures to prevent the discharge of sediments and pollutants from the site in to surface and groundwater sources. Report any contact with groundwater to the environmental coordinator.

#### 7.4. Surface and Groundwater Management Measures

The Surface and Groundwater Management measures are designed to minimise the runoff of sediment-laden or polluted water/ effluent into the surrounding environment. Activities that could potentially alter natural surface water and groundwater quality include:

- Chemical spills
- Refuelling
- Seepage of wastewater into groundwater
- Trenching and pitting
- Poor resource stewardship practices.

The following requirements are to be met to ensure that groundwater is not contaminated:

- Fuel/Oil and chemicals must be safely stored and removed.
- Any contact with surface or groundwater must be treated with exceptional care and reported immediately, to minimize the potential for contamination of an aquifer.
- Water used for gravel separation will be diverted away from the watercourse, will not be discharged into the drainage channels.

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#### **TABLE 5 - WATER QUALITY MITIGATION MEASURES**

Aspect	Mitigation Measure	Responsibility
Pollution	Visual monitoring and photographic record of any surface and/or	Environmental
control	groundwater intersected	coordinator
measures.	Visual monitoring during rainfall events for runoff of polluted	Environmental
	water	coordinator
	Vehicles and machinery are to be regularly serviced to minimise oil	Site manager
	and fuel leaks.	
	Good housekeeping shall be maintained and chemicals, and fuel	Site manager
	must be stored securely to prevent any accidental spills on the EPL	
	site	
Sewage	Portable chemical toilet facilities will be hired for onsite use and	Environmental
	any sewerage generated will be managed by the supplier/	coordinator and site
	contactor.	manager

#### 7.5. Surface and Groundwater Quality Monitoring Programme

Every effort must be made throughout to preserve the quality of groundwater sources that the proponent may impact. Containment of waste and chemicals and the correct disposal thereof must be of an acceptable standard. Personnel must report any unusual conditions and intersection with surface and groundwater immediately to the environmental coordinator. A photographic record should be kept for future comparison.

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### 8. WASTE MANAGEMENT PLAN

#### 8.1. Introduction

The activities at the facility will generate both solid and liquid waste. The potential types of waste generated at the facility are typical for domestic home operations. Operational waste will include chemical waste such as spent dye and inks, hydrocarbon waste from servicing of vehicles etc, that must be handled by registered waste disposal units.

#### 8.2. OBJECTIVES

This Waste Management Plan has been prepared to ensure the proper storage, transport, treatment and disposal of waste and where possible will follow the waste hierarchy, which encourages waste avoidance and waste reduction followed by reuse, recycling and reclamation, before waste treatment and waste disposal.

#### 8.3. ROLES AND RESPONSIBILITIES

#### WORKFORCE AND ALL CONTRACTORS

- Required to ensure that all waste generated during construction are removed and disposed of accordingly
  including providing evidence in the form of waste transfer receipts for the waste moved off site.
- Ensure no windblown rubbish pollutes the environment, and
- Remove waste on a regular basis to prevent vermin.

#### 8.4. SOLID WASTE

Where possible the proponent will implement measures to reduce, reuse and recycle waste generated as part of the operations of the facility.

Waste will be controlled through prevention and mitigation measures as follows:

- Reduce, reuse and recycle where possible
- Storage of domestic waste on site may result in the attraction of unwanted scavengers and should be disposed of the accredited site as soon as is feasible, and
- Hydrocarbon and chemical contaminated solids have the potential to cause contamination to the soil, ground and/or surface water, thus correct storage and disposal methods are required.

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#### **TABLE 6 - WASTE MITIGATION MEASURES**

Aspect	Mitigation Measure	Responsibility
Environmental	Hydrocarbon and chemical contaminated solids must be storage	Proponent
Contamination	correctly and disposed of by registered companies.	
from liquid waste	Safe disposal certificates must be kept and provided to the	Proponent
	Project manager on request.	
Littering and	No littering by workers shall be allowed.	Proponent
Environmental	All litter on and around the facility should be picked up and	All staff
Contamination	placed in the bins provided.	
from waste	The site should be kept tidy and free of litter at all times. All	All staff
	domestic and general waste produced on a daily basis should be	
	cleaned and contained daily.	
	No solid waste landfill will be established at the site.	Proponent
	No waste shall be burned or buried anywhere unless when	Proponent
	advised to do so by the local Municipality.	
	Recycling bins will be provided in appropriate areas to enable	Proponent
	waste and refuse to be sorted for recycling and re-use. Bins	
	should be inaccessible to domestic animals	
	All solid waste must be collected, recycled where possible, and	Proponent
	otherwise disposed of by appropriately licensed disposal teams.	
	All rubble is to be removed from the site to an approved disposal	Proponent
	site. Burying of rubble on site is prohibited.	

# 8.5. WASTE DISPOSAL MONITORING

Certificates providing the safe disposal of waste from a permitted waste disposal site must be provided to the Manager upon request.

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#### 9. SPILL MANAGEMENT PLAN

#### 9.1. Introduction

The uncontrolled release of fuels and other chemicals has the potential to result in the contamination of soil, groundwater and surface water, which may lead to serious environmental harm. On this basis, the storage and use of fuels or other chemicals must be managed to minimise the risk of a release, and measures must be in place to promptly address impacts should a release occur.

#### 9.2. OBJECTIVES

This Spill Management Plan has been prepared to minimise the potential for the uncontrolled release of fuels, oils and other chemicals. Preventative measures to minimise the potential for a spill are listed. Should a spill occur, this plan provides guidance for the proponent on the appropriate spill response measures.

#### 9.3. ROLES AND RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

Required to implement the spill prevention and response measures listed below.

#### 9.4. SPILL PREVENTION MEASURES

The following management measures are to be implemented by the Proponent:

- Spill kits are to be made available throughout the site. The kits are to include, as a minimum, the following items:
  - Absorbent materials
  - Shovels
  - Heavy-duty plastic bags
  - o Protective clothing (e.g. gloves and overalls), and
  - o Major servicing of equipment shall be undertaken offsite or in appropriately equipped workshops
- Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all onsite staff
- Fuels, lubricants and chemicals are to be stored within appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored
- All fuel and chemical storage and handling equipment (including transfer hoses, etc.) shall be well maintained
- Storage and handling of fuels and chemicals shall be in compliance with relevant legislation and regulations
- No refuelling is to take place within 50 metres of groundwater boreholes, surface water or streams, and
- Material Safety Data Sheets are to be kept for each chemical used on site. These must be easily accessible to all personnel.

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#### 9.5. SPILL RESPONSE MEASURES

The primary concern, in the event of any spill, is the health and safety of any residents and contractors in the vicinity. Of secondary, but highly significant, importance, is the protection of water sources and then soil and vegetation.

#### The following points therefore apply to all areas on the site:

- Assess the situation for potential hazards.
- Do not come into contact with the spilled substance until it has been characterised and necessary personal protective equipment (PPE) is provided.
- Isolate the area as required.

#### The following measures are to be implemented in response to a spill:

- Spills are to be stopped at source as soon as possible (e.g. close valve or upright drum)
- Spilt material is to be contained to the smallest area possible using a combination of absorbent material,
   earthen bunds or other containment methods
- Spilt material is to be recovered as soon as possible using appropriate equipment. In most cases, it will be necessary to excavate the underlying soils until clean soils are encountered
- All contaminated materials recovered subsequent to a spill, including soils, absorbent pads and sawdust, are to be disposed to appropriately licensed facilities
- A written Incident Report must be submitted to the manager.

#### **TABLE 7 - SPILL MITIGATION MEASURES**

ASPECT	MITIGATION MEASURE	RESPONSIBILITY
Stored	Hazardous chemicals are to be stored in bunded areas	Proponent
Hazardous	Hazardous chemicals (such as fuels) are to be handled over areas	Proponent
Chemicals	provided with impervious surfaces	
	Spills of hazardous chemicals are to be contained and cleaned-up	Proponent
	to ensure protection of the environment	
	All the necessary PPE required for the safe handling and use of	Proponent
	petrochemicals and oils shall be provided to, and used or worn	
	by, the onsite staff	
Machinery and	Major servicing of equipment shall be undertaken offsite or in	Proponent
Equipment	appropriately equipped workshops	
Maintenance	For small repairs and required maintenance activities all	Proponent
	reasonable precautions to avoid oil and fuel spills must be taken	
	(e.g. spill trays, impervious sheets).	
	Vehicles and machinery are to be regularly serviced to minimise	Proponent
	oil and fuel leaks	
	All the necessary PPE required for maintenance activities must be	Proponent
	issued to staff whose duty it is to manage and maintain the	
	machinery and equipment.	

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# 9.6. SPILL REPORTING

All major petroleum product spills should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled; Reporting of major petroleum product spill' attached as Appendix B.

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# 10. AIR QUALITY MANAGEMENT PLAN

#### 10.1. INTRODUCTION

Particulate and gaseous emissions from vehicle exhausts, wind erosion and other activities associated with the project have the potential to affect amenity, safety, human health and the environment.

This Air Quality Management Plan describes the strategies and procedures that will be implemented to ensure that the health and amenity of construction workers and nearby sensitive receptors are protected from elevated concentrations of airborne dust and other gaseous emissions. In cases where generators and other machinery are used, there will be some release of exhaust fumes that will impact the immediate vicinity but will be of short duration.

#### 10.2. OBJECTIVES

The main objective of the Air Quality Management Plan is to ensure that emissions from operational activities are controlled to an acceptable level and do not significantly impact-adjoining properties such as the neighbouring communities, farms or other sensitive receptors.

- As far as reasonably practical, activities should not generate visible dust.
- Machinery should not emit excessive exhaust fumes.

#### 10.3. RESPONSIBILITIES

#### **WORKFORCE AND ALL CONTRACTORS**

To implement the necessary management practices in order to meet the objectives listed above.

#### 10.4. AIR QUALITY MANAGEMENT PROCEDURES

Activities that may potentially emit dust during the operations include the following:

- Vehicle movements
- Machinery operations

The proponent will minimise the potential for dust generation by undertaking the following management measures, as required:

- Vehicle movements will be restricted to sealed roads.
- Appropriate speed limits will be set and enforced.
- Ground disturbance will be minimised as far as practical.
- Vehicles and machinery will be maintained so as to limit exhaust fume emissions.

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#### **TABLE 8 - AIR QUALITY MITIGATION MEASURES**

ASPECT	MITIGATION MEASURE	RESPONSIBILITY
Dust and fumes	Vehicles must adhere to speed limits so as to avoid	Proponent
	producing excessive dust.	
	Vehicles and machinery are to be regularly serviced	Proponent
	according to the manufacturers' specifications and kept in	
	good working order so as to minimise exhaust emissions.	

#### 10.5. AIR QUALITY MONITORING PROGRAMME

Visual monitoring of construction activities can ensure the minimum discharge of airborne dust and other emissions according to the Air Quality Management Plan.

#### 10.6. NOISE IMPACTS

Activities at the lodge have the potential to generate nuisance noise that can impact the quality of life for neighbouring residents.

- The proponent should continue to ensure potential noise sources are mitigated through measures such as
- Avoid noise generating activities at night
- Avoid noise generating activities that could impact other land users in the area by ensuring noisy activities are avoided especially at night, ensure appropriate measures are put in place to rectify noise compliant should they occur.
- Scheduling of works to avoid disturbance between the hours of 7 am and 5 pm, and
- Procedures for receiving complaints from nearby land users or residents to be in place and mitigation measures to be implemented should construction generate excessive noise, which is unexpected.

Occupational noise is managed through the health and safety management plan and therefore not applicable to this EMP.

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# 11. IMPLEMENTATION OF THE EMP

This Environmental Management Plan (EMP):

- A. Has been prepared according to a contract with the proponent
- B. Has been prepared based on information provided to ECC up to August 2019
- C. Is for the sole use of the proponent, for the sole purpose of an EMP
- D. Must not be used (1) by any person other than the proponent or (2) for a purpose other than an EMP, and
- E. Must not be copied without the prior written permission of ECC.

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# APPENDIX A: APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

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### DEPARTMENT OF WATER AFFAIRS & FORESTRY

FAX:	(061) 208 7160	PRIVATE BAG 13184	
TEL:	(061) 208 7111	WINDHOEK	
REFERENCE I	NO:	NAMIBIA	
APPLICA'	TION FOR A WASTEWATER	DISCHARGE LICENCE, IN TERMS	
OF PART	XIV OF THE WATER RESOU	RCES MANAGEMENT ACT, 2004	
	of Namibia, No. 3357, of	the Government Gazette of the 23 December 2004, Government	
A. GENER	AL INSTRUCTIONS		
1. Application	s must be submitted in duplicate to: The Permanent Secretary Attn.: Law Administration Ministry of Agriculture, Water and Fore Private Bag 13184 WINDHOEK	estry	
Application Fee (to accompany this document):  N\$			
Section Section	s sections have to be completed as follows B & C - All applicants D - Complete only the part relevant E - All applicants (compulsory!)	ows: ant to technology employed in your works.	
4. Only the re	levant Sections that have been filled in	need to be submitted with this application.	
5. A separate	application needs to be filled in for each	ch different plant/works.	
NAME OF T	REATMENT PLANT/WORKS:		
PLACE:	(e.g. town, settlement)	GPS Coordinates:	
	1		

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1.	Name of applicant:			
2.	Address - Contact Person:			
	- Postal:			
	- Physical:			
	- Tel No.:			
	- Fax No.:			
	- E-mail:			
3.	Region in which plant is situated:			
4.	Constituency in which plant falls:			
5.	Type of establishment: (e.g. school, town, industry)			
3.	Source of water supply: (e.g. borehole, river, sea)			
7.	Total water consumption:			m³/day ADWF*
	(*ADWF = Average Dry Weather Flow)			m <sup>3</sup> /day ADWF*
	<ul> <li>Consumption based on the average usage over a 12-month</li> </ul>			m³/day ADWF*
	period.  • List different sources separately			m <sup>3</sup> /day ADWF*
3.	Application:  • Prepared by:	Name :	Position:	
			<u> </u>	
	(e.g. Consultant)	Signature:	Date:	
	Responsible Executive:	Name :	Position:	
		Signature:	Date:	
			<u> </u>	

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#### C. TECHNICAL DETAILS - GENERAL

Answers to the following information must be contained in this application either from the questionnaire or as an attachment thereto (see also details in Appendix A):

NAME OF TREATMENT PLANT/WORKS:
Type of effluent (please also refer to Section D for classifications):
2. Site of works:
2.1 Submit a site plan indicating the exact location (or intended location) of the works. This plan should indicate (as a minimum):
2.1.1 General location of the works with regards to settlements, main roads, boreholes, rivers etc.
2.1.2 Layout plan of property showing all existing and proposed water pipes and effluent and drainage lines in distinctive colours.
2.1.3 Topographical plan/area photograph/contour plans showing the property and effluent treatment plant in relation to residential areas, rivers, pans, dams, lakes and boreholes.
2.1.4 Contour plans indicating the exact location of the effluent treatment works and point of discharge of final effluent in relation to watercourses that drain the area.
2.1.5 Give the following information:
2.1.5.1 Distance to nearest inhabitants:m
2.1.5.2 Distance to nearest water abstraction point (e.g. river, borehole):m
2.1.5.3 Distance to nearest watercourse (e.g. dry river) and specify:m
2.1.5.4 Wind direction (main/normal)
2.2 Submit overall details of works:
2.2.1 Type of effluent treatment system and a brief description of its method of operation. (If domestic effluents are dealt with by the local authority please enclose a letter from the authority confirming this agreement).
2.2.2 Flow diagram/mass balances to show the present average quantities of incoming water, recycled water, final outflow, seepage and evaporation losses (all in m.3/day).
2.2.3 Layout orientation drawing indicating all major treatment units and fence around works.
2.2.4 Complete flow diagram and key design parameters to include:
2.2.4.1 Dimensions and design capacities of each unit process;
2.2.4.2 Process Flow Diagram(s) and major instrumentation employed, e.g. water meters;
2.2.4.3 Loadings on the system (e.g. hydraulic, COD, BOD, nitrogen, phosphate);
2.2.5 Indicate allowances that have been made for future expansion and increased loads (if any).

- 2.2.6 Methods of sludge disposal or recirculation.
- 2.2.7 Disinfection of the final effluent (indicate dosing type, method, retention period and optimum disinfectant level in final effluent).
- 3. Monitoring boreholes for monitoring groundwater pollution over time must be available within 500 m of the point of final effluent discharge.
- Please note: Additional information is required for new treatment plants (e.g. an environmental 4. impact assessment) - details can be obtained from the Department of Water Affairs and Forestry.
- All relevant information must be included with this application. It is a criminal offence to 5. deliberately withhold vital information relevant to this application. Where applicants are found to be in contravention with this requirement, they may/will be prosecuted.



	NICAL DETAILS - SPECIFIC  nould only complete sections relevant to their specific effluent (please tick relevant box):
	1-1: Domestic Effluent - Includes wastewater collected in towns (excluding industrial effluent!), villages, schools, lodges, administration buildings.
	0-2: Industrial Effluent - Includes wastewater generated by any industry, factory, etc.
	<ul> <li>Mining Effluent - Includes wastewater accumulated or collected due to mining operations (e.g. Acid mine wastewater)</li> </ul>
	-4: Combination/mix of various effluents (list major effluent streams on page 11)
sensible reu processes. The allowa circumstand which shoul impact asse A separate	re on Namibia's existing fresh-water supplies can, to a great extent, be eased by the use of effluents for a variety of purposes including dust control, agriculture and industrial. Therefore, reuse of effluent after suitable treatment is encouraged.  Therefore, reuse of an effluent is dependent upon its quality as well as many local cases and hence each application in this category needs careful and individual scrutiny, do be undertaken by a specialist in this field and must be supported by an environmental essment study.  Ilicence for effluent reuse is required and more details in this regards can be obtained epartment of Water Affairs and Forestry.

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#### **D-2. INDUSTRIAL EFFLUENTS**

2.1	Describe industry and major activities resulting in efflu	ent generation				
2.2	Capacity / Flowrates :					
	Design - Average daily flow		m. <sup>3</sup> /d			
	- Peak hourly flow		m <sup>3</sup> /h			
	Actual (if in operation) - Average daily flow		m.3/d			
	- Peak hourly flow		m.3/h			
	If ponds are employed, state total surface area		m²			
2.3	List only major contaminants (also attach full analysis	of typical effluent sample)				
2.4	Type of treatment employed (give short overview of pro-	ocess):				
2.5	List major treatment chemicals* employed in the unit p	rocess(es):				
2.6	Final effluent quality after treatment (put envisaged final	al quality for a new plant):				
2.7	Sludge generation:		1 2			
	- Volume generated		m <sup>3</sup> /d			
	- Mass		kg/d (dry solid)			
	- Method of disposal					
	- Place of disposal					
	- Major constituents					
	- If sludge ponds, state frequency of cleaning					
2.8	Do you employ cleaner production principles (CPP)? If "yes", elaborate:	Yes/No				
2.0	In the following decrementation included (since and a since and si	not\2				
2.9	Is the following documentation included (give reason if  Water (and waste) management plan:  Decommissioning plan:	Yes/No Yes/No				

<sup>\*</sup> For the chemicals employed, proper mass balances should be included that show chemical usage, movement and discharge within the factory/process(es). All safety aspects related to handling, storage and disposal of chemicals on site must be followed at all times.



### D-4. COMBINATION OF VARIOUS EFFLUENTS

Plant	Name:				
4.1	Describe major activities resulting in effluent generation	(e.g. type of	industry):		
4.0	Capacity / Flowrates of different streams (major only)	1	2	3	
4.2	Type (e.g. domestic, industrial, mining, others)				
	Design - Average daily flow				m.3/d
	- Peak hourly flow				m.3/h
	Actual (if in operation) - Average daily flow				m.3/d
	- Peak hourly flow				m.3/h
4.3	List only major contaminants (also attach full analysis o	f typical efflue	ent sample)		
4.5		.,			
C ESSENCIARE	Type of treatment applicant (give about averyious of pre-				
4.4	Type of treatment employed (give short overview of pro	cess)			
4.5	List major treatment chemicals employed in the unit pro	ress(es).			
т.5	List major deather creminals employed in the unit pro				
4.6	Final effluent quality after treatment (put envisaged fina	l quality for a	new plant)		
4.7	Sludge generation:				
	- Volume generated				m.3/d
	- Mass				kg/d (dry solid)
	- Method of disposal				(3.) 50.14)
	- Place of disposal				
	- Major constituents				
	If aludes names state frequency of elemina				



#### E. FINAL EFFLUENT DISPOSAL

1.4.1	Where is the final effluent discharged to? (E.g. French drain, pumped out by Local Authority, dry river course, perennial river, etc.)				
1.4.2	IF soakaway, state: - Type of soil - Suitability/porosity of soil - Size of soakaway area - Include topography and plan of soakaway area				
1.4.3	Is there any post-treatment applied? (e.g. disinfection, filtration)				
1.4.4	Is the final effluent re-used? (Yes/No)				
	If "Yes", complete:				
	- Do you have a reuse licence?				
	- Amount of water that will be re-used:	m³/d			
	- For what application:				
	- Type of irrigation used (if applicable):				
	- What crops are grown:				
	- Area of land that will be irrigated:	ha			
1.4.5	Name (if any) downstream users (downstream of discharge point).				
1.4.6	Past records of complaints or objections by people living close to works:				

 $\begin{tabular}{ll} \hline Reuse: \\ A reuse licence is required - details can be obtained from the Department of Water Affairs and Forestry. \\ \hline \end{tabular}$ 

#### Irrigation:

The crops allowed to be irrigated are dependent upon effluent quality (details will be supplied on request by the Department of Water Affairs and Forestry).



# APPENDIX B - REPORTING OF MAJOR PETROLEUM PRODUCT SPILL FORM PP/11

Government Gazette 23 June 2000 64 No. 2357 FORM PP/11 MINISTRY OF MINES AND ENERGY PETROLEUM PRODUCTS AND ENERGY ACT, 1990 PETROLEUM PRODUCTS REGULATIONS (2000) REPORTING OF MAJOR PETROLEUM PRODUCT SPILL (Regulation 49(1)) (Please note that where form is completed by hand it must be completed in capital letters) 1. Name of licence/certificate-holder/person ..... ..... (\*Delete whichever is not applicable) 2. Postal address ..... ..... 3. Physical address ..... 4. Telephone Number (including code) 5. Facsimile Number (including code) 6. Licence/certificate\* number and date of issue, if applicable ..... (\*Delete whichever is not applicable) 7. Date of petroleum product spill 8. Location of petroleum product spill ..... ..... ..... 9. Reasons for petroleum product spill ..... 



	product involved in petroleum produc	
11. Quantity of the petro	oleum product spill	
40 T W . I W . I		
	e petroleum product has or will have	
	e safety and health of person or the pr	17 1766 1776
	of all remedial actions taken to min	
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APPENDIX C - COMPLAINTS REGISTER TEMPLATE

NAME	CONTACT DETAILS	DATE AND LOCATION OF COMPLIANT	NATURE OF COMPLIANT	ACTION TAKEN TO RESOLVE	NOMINATED PERSON TO RESOLVE ISSUE (Signature)	DATE OF RESOLUTION/ CLOSED OUT COMPLAINT

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# **APPENDIX D - MONTHLY INTERNAL COMPLIANCE CERTIFICATE**

FOR THE PERIOD TO	
MANAGEMENT REPRESENTATIVE:	SIGN:
SHE COORDINATOR:	SIGN:
Date of Submission:	
Key activities on site during the month:	
NON-CONFORMANCE:	
Area of activity:	
Reason:	
Responsible party:	
Results:	
Correction action taken:	

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Intended follow-up:
GOOD PERFORMANCE:
Description of activity or action in which the area/person went beyond compliance towards responsible care for the environment:
ADDITIONAL COMMENTS:

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