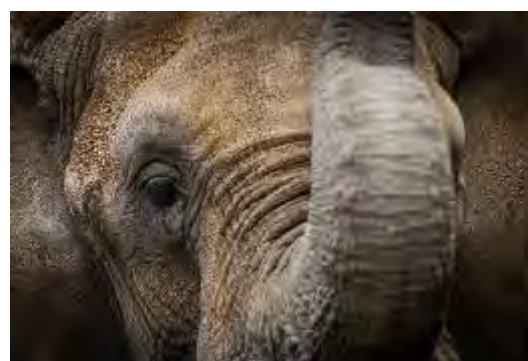




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ENVIRONMENTAL MANAGEMENT PLAN

EXPLORATION ACTIVITIES ON EPL 7368 FOR NUCLEAR FUEL MINERALS,
ERONGO REGION



NOVEMBER 2019

TITLE AND APPROVAL PAGE

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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

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 Marenica Ventures Ltd. Marenica has also developed a uranium concentration process that is unique and ground-breaking, lowering the extraction cost of uranium at the Marenica deposit as well as various environmental benefits. This *U-pgrade™* technology can be applied to surficial uranium deposits and is capable of concentrating uranium by a factor of up to 50 times, thereby reducing the feed to a leaching circuit dramatically.

Marenica Ventures Ltd proposes to undertake mineral exploration activities for nuclear fuel minerals on Exclusive Prospecting Licence (EPL) 7368 located approximately 34km north east of Arandis (nearest town), and 100 km north east the Swakopmund town via the B2 road. The EPL is approximately 35km from Dorob National Park and is approximately 1674ha as illustrated in **FIGURE 1**.

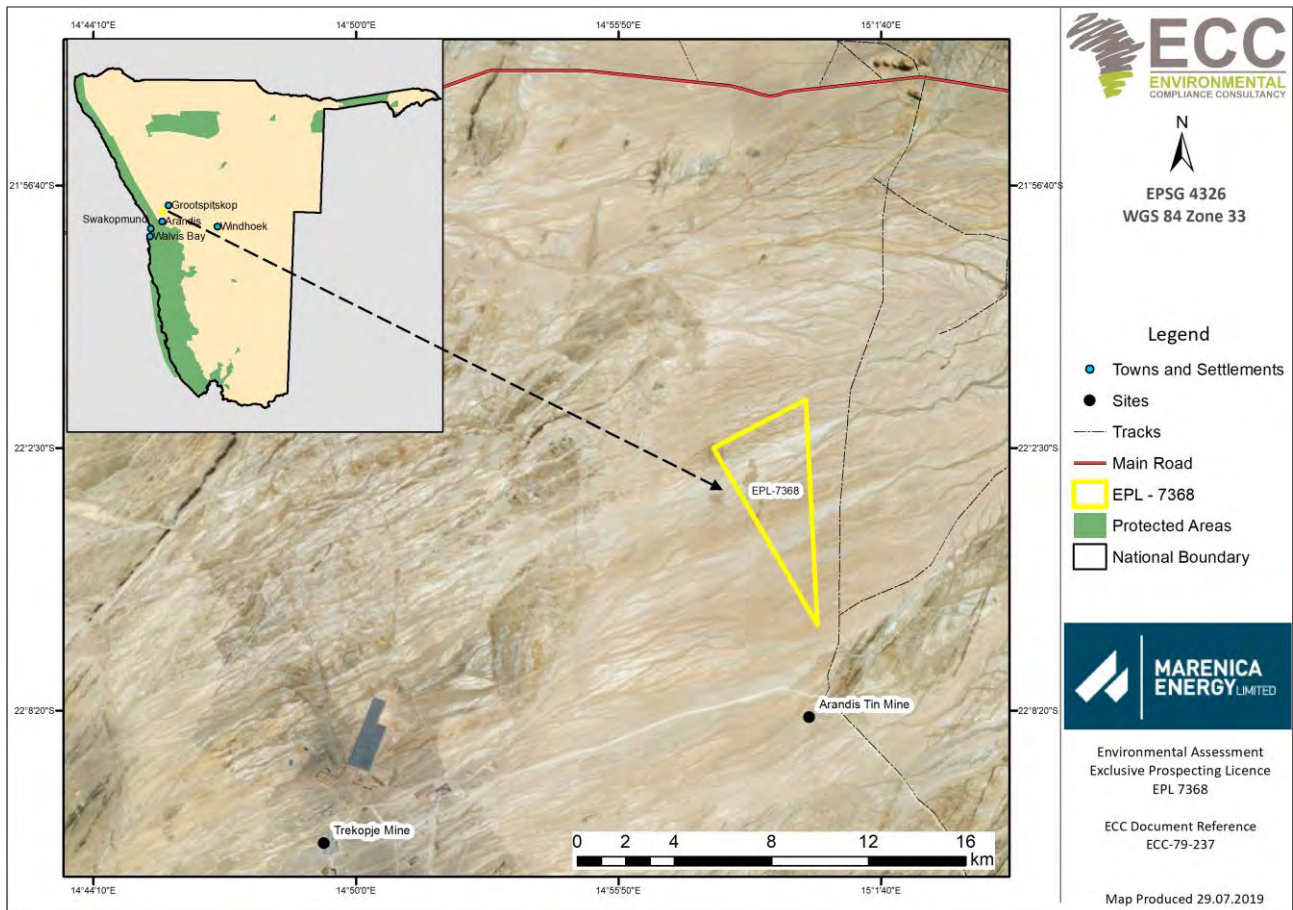


FIGURE 1 - LOCALITY OF EPL 7368

1.2. ENVIRONMENTAL REGULATORY REQUIREMENTS

The proposed project is considered as a listed activity as stipulated in the Environmental Management Act 7 of 2007 and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2012). 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. 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. PURPOSE AND SCOPE OF THIS REPORT

This EMP provides a logical framework, mitigation measure and management strategies for the exploration activities associated with the proposed project. In this way, ensuring that the potential environmental and social impacts are mitigated and minimised as far as practically possible and that statutory and other legal obligations are adhered to and fulfilled. Outlined in the EMP are the protocols, procedures and roles and responsibilities to ensure the management arrangements are effectively and appropriately implemented.

The EMP forms an appendix to the environmental scoping report and is based on the findings of the assessment; therefore, the environmental scoping report should be referred to for further information on the proposed project, assessment methodology, applicable legislation, and assessment findings.

This EMP is a live document and shall be reviewed at predetermined intervals, and/or updated when the scope of works alters, or when further data /information is added where uncertainty exist, if there is any. All personnel working on the project will be legally required to comply with the standards set out in this EMP.

The scope of this EMP includes all activities carried out during the exploration stage in search of Nuclear Fuel Minerals on the following EPL 7368.

1.4. MANAGEMENT OF THIS EMP

The proponent, Marenica Ventures 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 exploration 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.

1.5. 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.

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.

1.6. 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 posted to the following address:

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1.7. STRUCTURE OF THIS EMP

The report has the following structure:

- Chapter 1 – Introduction
- Chapter 2 – Environmental management framework
- Chapter 3 – Communication and Training
- Chapter 4 – Incident Reporting
- Chapter 5 – Compliance and enforcement
- Chapter 6 – Surface and ground water management plan
- Chapter 7 - Waste Management Plan
- Chapter 8 – Spill Management Plan
- Chapter 9 – Air Quality Management
- Chapter 10 – Implementation of the EMP

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 objectives and targets have been developed so that exploration activities can minimise potential impacts on the environment, as far as reasonably practicable, for example by following a mitigation hierarchy.

Environmental objectives for the project are as follows:

- Zero pollution incidents
- Minimal vegetation clearing and earthworks
- Protect local flora and fauna, and
- Use natural resources effectively and efficiently.

2.2. ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The proponent shall provide a project team to oversee and undertake the preparation and exploration activities, which will be composed of the proponent's personnel and contractors. A nominated role shall be identified to ensure the management and implementation of this EMP is throughout the project, which will be supported by the proponent.

The proponent shall be responsible for:

- Ensuring all members of the project team, including contractors, comply with the procedures set out in this EMP
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood, and
- Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this EMP, and meet the responsibilities listed above.

The key personnel and environmental responsibilities of each role through the project life are presented in TABLE 1.

TABLE 1 – ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITIES & DUTIES
Proponent	– Responsible for the management and implementation of the EMP – Ensure environmental policies are communicated to all personnel throughout the proposed project and that employees understand the guidelines of the EMP – Responsible for providing the resources required to complete the project tasks – Appoint a site manager and project manager, and – Ensure all workers are inducted on health and safety measures.
Exploration Management	– Oversee exploration activities – Monitor daily operations and ensure adherence by personnel to the EMP – Maintain the community issues and concerns register and keep records of complaints, and

ROLE	RESPONSIBILITIES & DUTIES
	– Maintain an up to date register of employees who have completed site induction.
Site Manager	– Ensure that all contract workers, sub-contractors and visitors to the site are aware of the requirements of this EMP, relevant to their roles and always adhere to this EMP – Report any non-compliance or accidents to the Project Manager – Receive, recording and responding to complaints – Ensure adequate resources are available for the implementation of the EMP – Ensure safe and environmentally sound operations, and – Responsible for the management, maintenance, and revisions of this EMP.
Employees	– Adhere to measures set out in the EMP – Ensure they have undertaken a site induction, and – Report any operations or conditions which deviate from the EMP as well as any non-compliant issues or accidents to the environmental manager

2.3. CONTRACTORS

Any contractors hired during the exploration 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 of environmental issues, including actual or potential environmental incidents and hazards, to the site manager and/or Project Manager, 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 government and community 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, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the exploration phase.

TABLE 2 provides a register of environmental risks and issues, which identifies mitigation and monitoring measures, as well as roles responsible. This register will be subject to regular review by the project manager and updated when

necessary. The project manager and site manager will use this register to undertake monthly inspections (see next section) to ensure the project is compliant with this EMP.

TABLE 2- ENVIRONMENTAL RISKS AND ISSUES, AND MITIGATION AND MONITORING MEASURES

RECEPTOR	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
Groundwater and soil	- Spillage may lead to soil and groundwater contamination - Drilling can cause reduction in soil quality (through soil contamination) - Soil erosion can be caused through vegetation clearance and possible creation of tracks.	Safe delivery and handling: - Training employees and toolbox talks - Good housekeeping across the site - Spill kits to be placed at designated areas across the site - Absorption material should be available and at hand. Where saw dust is used, it should be cleaned up immediately and not left for long periods as this poses a fire hazard - Any major spill is reported to the project manager and Ministry of Mines and Energy - Equipment to be well maintained and serviced regularly - The use of hydrocarbons under 200 litres can be used for mobile refuelling or servicing - Topsoil should be separately stockpiled to be re-spread when backfilling - Equipment must be in good condition to ensure that the oil spills do not contaminate the site - In the unlikely event, extraction volumes of water shall be minimal during exploration and where possible, water from existing water sources shall be used. Storage: - Fuel to be stored in tanks bakkies and bunding will not be practically possible. Refuelling: - Drip tray to be used during refuelling of vehicles - A funnel or similar should be available and used to avoid spillage during decanting - Equipment must be in good condition to ensure that the oil spills do not contaminate the site.	- Daily observations when fuels are delivered and handled - Supervision during refuelling - Weekly observations monitor containment and storage.	Exploration manager
Socio-	- Employment creation	- Maximise local employment and local business opportunities to promote and	- Daily observations	- Exploration

RECEPTOR	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
economic	- and skills development – Opportunities during the exploration phase (Approx. 10-20 jobs)	- improve the local economy – Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained, and – Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible	– Weekly checks	- manager – Employees
Terrestrial and ecology	– Possible injury or death of animals – Poaching – Habitat fragmentation from clearing, pitting and trenching – Habitat loss from excessive clearing	– Use existing tracks where possible – Route new tracks around established and protected trees, and clumps of vegetation – Identify rare, endangered, threatened and protected species and demarcate them and avoid removing them – In the unlikely event, all workers on-site are to be notified to avoid any excluded areas or species – Progressive rehabilitation during the exploration phase should be applied – No camping within river beds – Avoid setting exploration sites and camps on visible game tracks – Natural drainage patterns should be restored if disturbed – Relocation of protected plant species if disturbance cannot be avoided. – No poaching	– Daily visual inspection during construction of new access tracks/widening	– Exploration manager – Employees – Site manager
Air quality	– Dust generation can impact public health and visibility – Impact on fauna and flora	– Use existing access roads and tracks where possible – Restricted speeds (<30km/h) – Provide protective masks and eyeglasses to employees in dusty working environments – Specific activities that may generate dust shall be avoided during high wind events, e.g. soil preparation activities	– Daily observations	– Exploration manager – Site manager
Heritage	Impact on viewshed/landscape surrounding heritage features	- If the discovery of unearthed archaeological remains to be uncovered, the following measures (chance find procedure) shall be applied: – Works to cease, area to be demarcated with appropriate tape by the site supervisor, and the Site Manager to be informed – Site Manager to visit the site and determine whether work can proceed without damage to findings, mark exclusions boundary – If work cannot proceed without damage to findings, Site Manager is to inform	Daily observations	– Exploration manager – Site manager

RECEPTOR	POTENTIAL IMPACTS	MANAGEMENT/MITIGATION MEASURES	MONITORING REQUIREMENTS	RESPONSIBILITY
		the Environmental Manager who will get in touch with an archaeologist for advice – An archaeological specialist is to evaluate the significance of the remains and identify appropriate action, for example, record and remove; relocate or leave in situ (depending on the nature and value of the remains) – Inform the police if the remains are human, and – Obtain appropriate clearance or approval from the competent authority, if required, and recover and remove the remains to the National Museum or National Forensic Laboratory as appropriate.		
Community Environment	– Nuisances (odours and visual), and – Litter (nuisance and ecological risk) – Damage, disturbance or interference with research equipment or experiments	– Training and toolbox talk to workers shall be provided – Ensure good housekeeping across the site – Implement the waste management hierarchy across the site: avoid, reuse, and recycle – Waste shall be collected and shall be removed regularly to avoid bad odours – It is unlikely that hazardous material and wastes will be produced, however, if they do, they shall be managed safely and responsibly to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials, and – Hazardous and non-hazardous waste shall be stored separately at all times – Identify research equipment or experiments and ensure zero damage or disturbance.	– Daily observations – Weekly checks	– Exploration manager – Employees
Topography and landscape	- Environmental disturbance - Loss of flora and fauna - Disturbance of migratory animals in the area	- Make use of existing tracks if available - When developing a new track from an existing road ensure the junction is discreet but is also safe - Avoid creating new access tracks on visible game tracks or routes or movement corridors between grazing and water resources - Monitor the condition of the track throughout the exploration period - Do not needlessly remove vegetation - Rehabilitate tracks after use	– Daily observations – Weekly checks	–
Resource use	Inefficient use of water resources	- Use water effectively and efficiently by following the reduce, recycle and re-use approach	Daily observations	– Exploration manager – Employees

3. COMMUNICATION AND TRAINING

3.1. COMMUNICATIONS

During exploration, the Project Manager and Site Manager shall communicate site-wide environmental issues to the project team 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.

This EMP shall be distributed to the exploration team including any contractors and personnel working on the exploration site to ensure that the environmental requirements are adequately communicated. Key activities and environmentally sensitive operations shall be briefed to workers and contractors.

During the exploration activities, communications between the management team shall include discussing any complaints received and actions to resolve them; any inspections, audits or non-conformance with this EMP; and any objectives or target achievements.

3.2. ENVIRONMENTAL EMERGENCY AND RESPONSE

TABLE 3 - EMERGENCY CONTACT DETAILS

TOWN	AMBULANCE	POLICE	FIRE BRIGADE
Swakopmund	+264-64 410 6000	219 048 or 10111	+264 81 128 5613
Walvis Bay	+264 81 129 3875	219 048 or 10111	+264 81 122 0833 or 081 122 0888

For large-scale spills and other significant environmental incidents, the fire services 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 spills, the relevant Material Safety Data Sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic 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

Any complaints received verbally by any personnel on the project site shall be recorded by the receiver, including the name and contact details of the complainant, date and time of the complaint, and the nature of the complaint. The information shall be given to the Project Manager who is overall responsible for the management of complaints and will provide a written response to the complainant. The Project Manager shall inform the Site Manager of issues, concerns or complaints. The Project Manager must maintain a complaint register that details the name of the complainant, date and time of the complaint, the action is taken to resolve the issues and date of complaint handover.

The workforce shall be informed about the complaints register, its location and the person responsible, 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 duration of the project and will be available for government or public review upon request.

3.4. TRAINING AND AWARENESS

All personnel working on the project 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.

3.5. SITE INDUCTION

All personnel involved in the project shall be inducted to the site with a specific environment and social awareness training, and health and safety issues. 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 Project Manager 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:
 - o What is meant by “environment” and the EMP?
 - o Why the environment needs to be protected and conserved?
 - o How exploration activities can impact on the environment?
 - o What can be done to mitigate against impacts?
- The inductee's role and responsibilities concerning implementing the EMP
- The sites environmental rules
- Details of how to deal with, and who to contact should any environmental problems occur
- Basic vegetation clearing principals and species ID sheets
- The potential consequences of non-compliance with this EMP and relevant statutory requirements, and
- The role of responsible people for the project.

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 Project Manager or the General 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 General Manager or the General 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 Project 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.

5. COMPLIANCE AND ENFORCEMENT

5.1. ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

Inspections and audits of the site will be managed and undertaken by the Exploration Manager to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly. All equipment will be inspected to ensure they 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: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action is taken and any necessary follow up measures required.

5.2. COMPLIANCE TO ENVIRONMENTAL PERMITS

5.2.1.1. FORESTRY PERMIT

In the unlikely event that some vegetation (excluding specially protected species) shall be cleared on the EPL sites to allow exploration activities to commence, the Forestry regulation Section 12 of 2007 shall be adhered to. A person is not authorised to harvest forest produce without a valid permit.

5.2.1.2. 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. A permit to abstract and use water may be required if boreholes are to be created, however this is unlikely.

5.3. WASTEWATER DISCHARGE PERMIT

In the event that the operations produce wastewater a permit must be obtained. 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.

5.4. REPORTING

Reports shall be submitted to the Mining Commissioner in terms of the Minerals (Mining and Prospecting) Act, 1992. The proponent is required to report quarterly, and a report shall be submitted 60 days after the currency of the EPL.

5.5. NON- COMPLIANCE

Where it has been identified that works are not compliant with this EMP, the Project Manager shall employ corrective actions so that the works return 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. The notice shall be generated during the inspections and the Project Manager shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcoming.

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

- There is evidence of a contravention of this EMP and associated indicators or objectives
- The Site Manager and/or Contractor have failed to comply with corrective or other instructions issued by the Environmental Manager or qualified authority, or
- The site manager and/or contractor fail to respond to complaints from the public.

Works shall be stopped in the event of a non-compliance until corrective action(s) has been completed.

5.6. 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 license/s, and
- Suspension of work.

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

6. SURFACE AND GROUNDWATER MANAGEMENT PLAN

6.1. 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.

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

6.2. OBJECTIVES

This Surface and Groundwater Management Plan has been prepared to minimise potential impacts on surface and groundwater resulting from the exploration activities on EPL 7368. It is important to report any contact with or contamination of groundwater to the environmental coordinator or site manager as soon as possible.

6.3. 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.

ENVIRONMENTAL COORDINATOR

Will ensure that the objectives listed above are being met and provide performance feedback to the Project Manager.

6.4. 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. Exploration activities that could potentially alter natural surface water and groundwater quality include:

- Chemical spills
- Refuelling
- Seepage of wastewater into groundwater
- Drilling
- 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.

TABLE 4 - WATER QUALITY MITIGATION MEASURES

Aspect	Mitigation Measure	Responsibility
Pollution control	Visual monitoring and photographic record of any surface and/or groundwater intersected	Environmental coordinator

measures.	Visual monitoring during rainfall events for runoff of polluted water	Environmental coordinator
	Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks.	Site manager
	Good housekeeping shall be maintained and chemicals, and fuel must be stored securely to prevent any accidental spills on the EPL site	Site manager

6.5. 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.

7. WASTE MANAGEMENT PLAN

7.1. INTRODUCTION

The exploration activities on EPL 7368 will generate both solid and liquid waste. The potential types of waste generated at the facility are typical for domestic home operations. All waste will be disposed of at the registered waste disposal unit in Swakopmund.

7.2. 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.

7.3. ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

- Required to ensure that all waste generated during exploration activities is 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.

SITE MANAGER AND ENVIRONMENTAL COORDINATOR

- Required to inspect receipts and evidence of correct waste handling.
- Review waste management practices regularly during exploration on EPL 7368 sites.

7.4. SOLID WASTE

Waste will be produced on site. All solid waste, shall be collected, taken off site and disposed of at the nearest waste management Facility (Swakopmund).

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.

TABLE 5 - WASTE MITIGATION MEASURES

Aspect	Mitigation Measure	Responsibility
Environmental Contamination from liquid waste	Hydrocarbon and chemical contaminated solids must be storage correctly and disposed of by registered companies.	Site manager and environmental coordinator
	Safe disposal certificates must be kept and provided to the Project Manager on request.	Environmental coordinator
Littering and Environmental Contamination from waste	No littering by workers shall be allowed.	Proponent
	All litter on and around the EPL site must be picked up and placed in the bins provided.	All staff
	The site should be kept tidy and free of litter at all times. All domestic and general waste produced on a daily basis should be cleaned and contained daily.	All staff
	No solid waste landfill will be established at the site.	Proponent
	Waste may be burnt on site as per the environmental condition. No waste shall be buried anywhere unless when advised to do so by the local Municipality.	Proponent

7.5. WASTE DISPOSAL MONITORING

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

8. SPILL MANAGEMENT PLAN

8.1. 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.

8.2. 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.

8.3. ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

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

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

Required to ensure that appropriately implemented spill prevention measures listed below and that any spills have been appropriately managed and reported.

8.4. 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:
 - o Absorbent materials
 - o Shovels
 - o 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.

8.5. 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.
- Notify the site manager or safety, health and environmental coordinator.

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
- The manager or safety, health and environmental coordinator are to be informed as soon as possible in the event of a spill, and
- A written Incident Report must be submitted to the Project Manager.

TABLE 6 - SPILL MITIGATION MEASURES

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

	oil and fuel leaks	
	All the necessary PPE required for maintenance activities must be issued to staff whose duty it is to manage and maintain the machinery and equipment.	Site manager/ environmental Coordinator

8.6. 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.

9. AIR QUALITY MANAGEMENT PLAN

9.1. 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.

9.2. 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.

9.3. RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

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

SITE MANAGER/ ENVIRONMENTAL COORDINATOR

To ensure that the objectives listed above are being met and to provide performance feedback to the Project Manager.

9.4. 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 existing tracks.
- 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.

TABLE 7 - AIR QUALITY MITIGATION MEASURES

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

9.5. AIR QUALITY MONITORING PROGRAMME

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

9.6. NOISE IMPACTS

Activities on the EPL 7368 have the potential to generate nuisance noise that can impact the quality of life for neighbouring residents and/or potential tourist activities however this potential impact are minimal due to the nature of the exploration methods employed.

Notwithstanding the above point, 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 users of 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 5pm and 7am, 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.

10. 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 September 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.

APPENDIX A: APPLICATION FOR A WASTEWATER DISCHARGE LICENCE



DEPARTMENT OF WATER AFFAIRS & FORESTRY

FAX: (061) 208 7160 PRIVATE BAG 13184
TEL: (061) 208 7111 WINDHOEK
REFERENCE NO: NAMIBIA

APPLICATION FOR A WASTEWATER DISCHARGE LICENCE, IN TERMS OF PART XIV OF THE WATER RESOURCES MANAGEMENT ACT, 2004

(Act No. 24 of 2004 - as published in the Government Gazette of the Republic of Namibia, No. 3357, of 23 December 2004, Government Notice No. 284)

A. GENERAL INSTRUCTIONS

1. Applications must be submitted in duplicate to:
The Permanent Secretary
Attn.: Law Administration
Ministry of Agriculture, Water and Forestry
Private Bag 13184
WINDHOEK
2. Application Fee (to accompany this document): N\$ _____
3. The various sections have to be completed as follows:
Section B & C - All applicants
Section D - Complete only the part relevant to technology employed in your works.
Section E - All applicants (compulsory!)
4. Only the relevant Sections that have been filled in need to be submitted with this application.
5. A separate application needs to be filled in for each different plant/works.

NAME OF TREATMENT PLANT/WORKS: _____

PLACE: _____ **GPS Coordinates:** _____
(e.g. town, settlement)

B. GENERAL INFORMATION

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) _____

6. Source of water supply:
(e.g. borehole, river, sea) _____

7. Total water consumption: _____ $\text{m}^3/\text{day ADWF}^*$
 - (*ADWF = Average Dry Weather Flow) _____ $\text{m}^3/\text{day ADWF}^*$
 - Consumption based on the average usage over a 12-month period. _____ $\text{m}^3/\text{day ADWF}^*$
 - List different sources separately _____ $\text{m}^3/\text{day ADWF}^*$

8. Application:
 - Prepared by: _____

Name :	Position:
_____	_____
(e.g. Consultant)	Signature: _____
	Date: _____

 - Responsible Executive: _____

Name :	Position:
_____	_____
	Signature: _____
	Date: _____

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: _____

1. 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 m³/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.

4. Please note: Additional information is required for new treatment plants (e.g. an environmental impact assessment) - details can be obtained from the Department of Water Affairs and Forestry.

5. All relevant information must be included with this application. **It is a criminal offence to deliberately withhold vital information relevant to this application.** Where applicants are found to be in contravention with this requirement, they may/will be prosecuted.

D. TECHNICAL DETAILS - SPECIFIC

Applicants should only complete sections relevant to their specific effluent (please tick relevant box):

☐
☐
☐
☐

D-1: Domestic Effluent - Includes wastewater collected in towns (excluding industrial effluent!), villages, schools, lodges, administration buildings.

D-2: Industrial Effluent - Includes wastewater generated by any industry, factory, etc.

D-3: Mining Effluent - Includes wastewater accumulated or collected due to mining operations (e.g. Acid mine wastewater)

D-4: Combination/mix of various effluents (list major effluent streams on page 11)

Final Effluent Reuse

The pressure on Namibia's existing fresh-water supplies can, to a great extent, be eased by the sensible reuse of effluents for a variety of purposes including dust control, agriculture and industrial processes. Therefore, reuse of effluent after suitable treatment is encouraged.

The allowable reuse of an effluent is dependent upon its quality as well as many local circumstances and hence each application in this category needs careful and individual scrutiny, which should be undertaken by a specialist in this field and must be supported by an environmental impact assessment study.

A separate licence for effluent reuse is required and more details in this regards can be obtained from the Department of Water Affairs and Forestry.

D-2. INDUSTRIAL EFFLUENTS

Plant Name:

2.1	Describe industry and major activities resulting in effluent generation		
2.2	Capacity / Flowrates :		
	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
	If ponds are employed, state total surface area		m ²
2.3	List only major contaminants (also attach full analysis of typical effluent sample)		
2.4	Type of treatment employed (give short overview of process):		
2.5	List major treatment chemicals* employed in the unit process(es):		
2.6	Final effluent quality after treatment (put envisaged final quality for a new plant):		
2.7	Sludge generation:		
	- Volume generated		m ³ /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)? Yes/No		
	If "yes", elaborate:		
2.9	Is the following documentation included (give reason if not)?		
	Water (and waste) management plan:	Yes/No	
	Decommissioning plan:	Yes/No	

* 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):				
4.2	Capacity / Flowrates of different streams (major only)	1	2	3	
	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 of typical effluent sample)				
4.4	Type of treatment employed (give short overview of process)				
4.5	List major treatment chemicals employed in the unit process(es):				
4.6	Final effluent quality after treatment (put envisaged final quality for a new plant)				
4.7	Sludge generation:				
	- Volume generated				m ³ /d
	- Mass				kg/d (dry solid)
	- Method of disposal				
	- Place of disposal				
	- Major constituents				
	- If sludge ponds, state frequency of cleaning				

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:	m ³ /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:	

Reuse:

A reuse licence is required – details can be obtained from the Department of Water Affairs and Forestry.

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

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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**

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10. Type of petroleum product involved in petroleum product spill

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11. Quantity of the petroleum product spill

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12. Indicate whether the petroleum product has or will have any negative effect on the environment and the safety and health of person or the property of persons

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13. Provide full details of all remedial actions taken to minimise risks associated with petroleum product spills and all cleaning-up operations taken in connection therewith

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DECLARATION

I,,
hereby declare that the information submitted by me in this application is true and correct.

.....
Signature

.....
Place

.....
Date