

SALTCOMPANY (PTY) LTD

Environmental Management Plan

Mining License ML66 E,F,G,H,I,J,K&L - Swakopmund



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ABBREVIATIONS

DWAF	Department of Water Affairs
EA	Environmental Audit
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ECP	Environmental Control Procedure
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERA	Environmental Risk Assessment
ERP	Emergency Response Plan
HSE	Health Safety Environment Officer
MD	Managing Director
MET	Ministry of Environment & Tourism
ML	Mining License
MME	Ministry of Mines & Energy
MSDS	Materials Safety Data Sheet
PM	Project Manager
RA	Roads Authority
RO	Research Officer
SEA	Strategic Environmental Assessment

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1. Introduction

1.1 Environmental Management Plan (EMP) Objectives

The main purpose of the Environmental Management Plan (EMP) is to provide a strategy for environmental protection whereby all the activities associated with SaltCo's (proponent) operations on ML66E,F,G,H,I,J,K&L.

The activities that occur within the mining licence areas are as follows:

- The production, harvesting, processing and transporting of salt (within ML66J and with accessory works within ML66G,H&I);
- The mining of calcitic marble (within ML66J) and dolomitic marble (within ML66E&F);
- The harvesting of guano from the seabird platforms (within ML66J);
- The cultivation of oysters for human consumption (within ML66J)

This is to ensure that time and national resources are not wasted and that problems occurring during all of SaltCo's operations are identified and rectified to prevent damage to the environment.

The present EMP addresses specific impacts identified in the EIA Report and the actions required to mitigate negative impacts or enhance positive effects. If any issues were overlooked, the plan must be amended in consultation with the proponent and regulatory authorities. The EMP therefore aims to ensure that:

- SaltCo's operations are managed efficiently and effectively to reduce or avoid negative impacts and enhance positive impacts of the operations;
- the affected communities are better off due to the continued operations of the SaltCo;
- precautions against environmental damage are considered timeously and claims are put into action speedily;
- information flow between all responsible persons is optimised to ensure all are aware of their particular responsibilities;
- involve the local community by employing unskilled and/or skilled labour;
- maintain the integrity of the ML66E,F,G,H,I,J,K&L areas

The EMP will be effectively implemented, if:

- mitigation measures are successively implemented during operations, expansion and decommissioning;
- the responsibilities are assigned to skilled individuals, groups, and government agencies;
- EMP guidelines are properly communicated to all responsible parties;
- training for implementing mitigation measures is carried out when personnel require such training;
- the monitoring programmes are adhered to;
- progress, training and monitoring reports are submitted to management and relevant government authorities

The Environmental Management Act and Regulations require that an environmental management plan for ML66E,F,G,H,I,J,K&L be developed (see Legal Section of EIA Report).

Eco-tourism related activities could benefit from gaining access to the saltpan areas for bird watching. Any access to the main operational areas must be restricted for public safety sake and may only allow tourist access by appointment and with a company escort.

The proponent recognises the attempts of the SEA to provide guidelines for the conservation of Namibia's natural heritage and has integrated measures into the EMP for conservation of various biodiversity aspects. Accepted mitigation measures concerned with the management of SaltCo's activities are to:

- delineate no-go areas that conserve biodiversity;
- establish a plan layout for crystalliser ponds for solar salt operations which allows for sustainable use of the resource;
- remove solid waste and dispose at the Swakopmund landfill;
- reduce risk of damage to infrastructure and equipment during the extraction, processing and transport of salt, guano and marble;
- maintain sustainable operating practices e.g. decommissioned site rehabilitation, waste recycling, rehabilitate contaminated soil

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2. Environmental Impacts

The key environmental impacts identified and discussed in the ML66E,F,G,H,I,J,K&L EIA Report for operations were identified by site visits, consultation with the proponent and a scoping assessment.

2.1 Key Positive Environmental impacts

The following key issues and potential positive impacts associated with the ML66E,F,G,H,I,J,K&L operations are:

- the operations help to create jobs and long-term employment;
- increase in exports for the Namibian economy;
- improve the standard of living of SaltCo's employees and contractor employees;
- the local economy benefits;
- continued and expanded project will create improved services and infrastructure for ML66 E-L areas;
- potential tourist attraction and creation of an integrated industry e.g. educational aspects of salt production / guano harvesting / aquaculture, saltpan bird watching, creation of a walking trail;
- implementation of environmental management measures to mitigate negative impacts;
- global carbon emission savings through sustained solar salt production;
- environmental awareness created for all operational personnel through training

2.2 Key Negative Environmental Impacts

- potential decrease in aesthetic value of natural areas within ML66E,F,G,H,I,J,K&L as they are prepared for solar salt operations, quarrying of marble, oyster farming ;
- ecology of the higher biodiversity areas (Coastal Hummock Dunes within ML66J) would be adversely affected if solar salt harvesting or accessory work activities extended into the boundaries of this habitat within the ML;
- potential increases in personnel resulting in increased water usage, waste and sewerage generation;
- the natural pan environment within ML66J is altered to create artificial crystalliser ponds;
- the natural environments within ML66E,F&J are altered due to the quarrying of dolomitic and calcitic marble;
- potential nuisance factor from noise creation may increase as a result of 24-hour operations;
- increased salt production / marble quarrying potentially increasing risks to vehicle safety as frequency of haulage increases;
- potential decrease in the road surface integrity due to increased haulage frequency could incur more frequent spending on road repairs;
- heritage aspects at risk due to expansion plans

2.3 Assessment of Significant Environmental Impacts

The potential impacts resulting from the operations within the ML66E,F,G,H,I,J,K&L areas were evaluated during the EIA. The suggested mitigations, if implemented, for potentially negative impacts will reduce the impacts on the biophysical and socio-economic environment so that their significance is negligible. The mitigation measures are included in the EMP implementation guidelines later.

3. Responsibilities, Capacity Building and Training Requirements

3.1 Responsibilities

The main stakeholders that are responsible for specific aspects of the EMP's implementation or to whom the responsibility reports:

Officer Bearers

- The **Proponent**- Salt Company (Pty) Ltd;
- **Project Manager (PM)**;

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- The **Environmental Assessment Practitioner (EAP)**
- The **Environmental Control Officer (ECO)**

Competent Authorities

- Environmental authority - Ministry of Environment & Tourism (**MET**)
- Department of Water Affairs (**DWA**)
- Ministry of Mines & Energy (**MME**)
- Ministry of Fisheries & Marine Resources (**MFMR**)

The roles and responsibilities of each individual / party are summarised in **Table 1**.

3.2 ECO - Detailed Responsibilities

- responsible for maintaining compliance to the EMP;
- implementation of the Environmental Management System (EMS);
- coordination, monitoring and consultation with stakeholders and personnel, including the promotion of environmental management competence and providing risk assessment expertise;
- undertake Environmental Risk Assessments (ERAs);
- set environmental objectives and targets;
- monitoring of systems to ensure compliance to legislation and company policies;
- to facilitate updating of the environmental management process and ascertaining the state of environmental risk and performance;
- compile annual reports for MET;
- ensuring that all personnel undergo environmental awareness training as per company environmental standards;
- coordinate internal and external environmental audits

3.3 Capacity Building and Training Requirements

The proponent is responsible to ensure all personnel are trained on all the company Health, Safety and Environment (HSE) policies relevant to the site. The plant equipment technical team must be trained to maintain the plant. Equipment manuals must be supplied and the supplier data sheets. HSE manuals must be available on site at all times. Material Safety Data Sheets (MSDS) are to be available for quick reference.

Where the capacity of the personnel is insufficient the proponent must take up the responsibility to build capacity especially where compliance to HSE issues are lacking. For this EMP to be successful, compliance monitoring is essential. Reporting the data from the monitoring to the environmental authority will be necessary in order to show that capacity building and training has been carried out.

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Table 1. Roles and responsibilities of each individual and/or party for the implementation of the ML66E,F,G,H,I,J,K&L EMP

PARTY	ROLE	RESPONSIBILITY & ACCOUNTABILITY
Proponent - SaltCo (Pty) Ltd	The proponent bears the ultimate responsibility for ML66E-L operations and is thus responsible for environmental performance.	Must be informed of environmental issues and impacts of all operations (existing and future) and the resultant effect that such activities have on the environment;
EAP	Undertake Environmental Impact Assessment and generate a draft Environmental Management Plan	To complete EIA and EMP reports; Ensure overall compliance of the EMP; Undertake periodic external environmental audits.
ECO	Monitor the implementation of the EMP as well as to identify potentially detrimental impacts not identified in the EMP so that it can be reviewed and updated.	Brief the contractor about the requirements of the EMP; Provide technical advice relating to environmental issues to the company's Project Manager (PM) ; Undertake periodic audits of the effectiveness of the environmental specifications on the site; Keep a record of activities on site with a site diary and site photographs; Receive the site monitoring results of the MLs biology and chemistry; Ensure that heritage sites are cordoned off from all activities with appropriate barriers.
MET	National Environmental Enforcing Agents	Enforcement of Environmental Regulations; Enforcing EMP compliance
DWA	Permitting authority for sea water and groundwater abstraction and effluent discharges into the sea or on land	Water Affairs oversees prevention and prohibition of all violations of national legislation concerning natural water bodies; They issue permits for abstraction and discharge.
MME	Issuing authority for mining licenses.	Responsible for the regulatory stipulations pertaining to the Minerals Act.
MFMR	Issuing authority for aquaculture permits	Responsible for monitoring water quality for the aquaculture sector

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4. Environmental Management System

The EMP guidelines provide a framework for creating a process and document control system. This system is commonly referred to as an Environmental Management System (EMS). This system includes the aspects of monitoring and reporting which are outlined in the EMP guidelines. Some of the EMS documentation elements are described below. The detailed documentation for every environmental aspect needs to be developed by the various officers. There may be considerable overlap between the health, safety and environment fields and it is advised that these three management systems be integrated especially where human and material resources are limited. The ECO can fulfil all three roles.

The ECO must take up the training, monitoring and reporting responsibility. It is important that the monitoring of the necessary environmental aspects of the SaltCo's operations is undertaken. The main purpose of monitoring is to ensure that the prescribed mitigation measures / actions in the EMP are complied with. The ECO officer should write up a monitoring report on a monthly basis. This can be compiled from the environmental control data sheet records. The environmental control data sheets need to be compiled in conjunction with the Environmental Control Procedure (ECP). The specialist health, safety and environment personnel should write up the ECPs for the various measures, controls and processes. Thereafter the environmental control data sheets can be drafted and used on a daily, weekly or ad hoc basis depending on the need. This data is used to write up the monthly environmental report.

Compliance with the EMP can be measured by means of periodic internal environmental audits. It is recommended that an internal environmental audit be undertaken every year. The first audit can take place 1 year after the receipt of the environmental clearance certificate. An annual environmental audit (EA) report can be compiled from the monthly monitoring reports. The proponent's supervisor will assess if the contractor is compliant with the EMP's guidelines and contract.

The Environmental Assessment Practitioner (EAP) should be approached to undertake an independent EA. Every 3 years the EAP should integrate the environmental audits into the application to renew the environmental clearance certificate. The updated EIA report should include an assessment of the impacts based on the internal EA reports and compliance to the EMP. This is to be submitted to the Ministry of Environment & Tourism.

The Department of Water Affairs requires monitoring reports to be submitted as per the permits that are issued for water abstraction and effluent discharge.

Whilst many of the anticipated environmental impacts have been identified in the EIA, there are possibly other impacts that arise from the SaltCo's operations. These should be assessed during the annual review process and included in any EIA updates.

5. EMP IMPLEMENTATION GUIDELINES

The following section (**Tables 2 to 12**) describes the main potential impacts as well as necessary measures to mitigate and/or enhance the potentially significant environmental and socio-economic impacts during implementation of each aspect of:

- Solar salt operations,
- Mining of calcitic marble and dolomitic marble
- Guano harvesting and
- Oyster farming.

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The guano harvesting and oyster farming are included in the EMP where relevant but not throughout all management plans. Expansion of these activities is not envisaged at this time. If this changes then the EMP will be updated to include these activities.

This document may need to be periodically reviewed and updated due to new insights or operational changes to ensure that all the environmental impact aspects are included. Upon re-application for the environmental clearance certificate every three years the updated EMP can be submitted for approval.

The mitigations and monitoring actions for each of the environmental impact aspects of each activity in the ML66E,F,G,H,I,J,K&L areas have been subdivided for each aspect of the operations. This operational EMP categorises aspects into loosely defined phases of planning, operational, expansion and decommissioning phases. These phases are applicable in the following ways:

- current activities place all operations within the **operational phase**;
- elements of the **planning phase** apply to the current baseline EIA report preparation, the review process, permit and certificate renewal periods;
- the establishment of new activities on site and the upgrading of infrastructure or equipment is covered under the **expansion phase**;
- should any of the activities discussed ever draw to a close then the **decommissioning phase** section will be applicable in particular the application of the fund to the rehabilitation of the ML66E,F,G,H,I,J,K&L areas.

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Table 2. Potential Noise Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L during Planning, Expansion, Operational and Decommissioning phases. (Authority refers to the responsible person / party)

Planning Phase

NOISE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS				
Organisms with increased sensitivity to noise can be disturbed or prolonged exposure can lead to hearing damage	Ensure noise levels do not exceed 60dBA for birds, workers on site should not be exposed to more than 110 dBA during a 24-hour period.	Noise monitoring plan is on file. Occupational health policy is on file	PROPONENT / EAP	MET / MME
Noise impact of inappropriate siting of crystallisers, wash dams and channels, salt processing plant, rock salt extraction, accessory works. Mine processing plant is very remote with no residential areas within a 10km radius. Impacts are negligible or insignificant.	Mitigations need to be planned. Maintenance plans for all equipment will ensure that noise impacts for personnel and tourists with result in negligible health and nuisance effects.	Noise monitoring plan is on file. Occupational health policy is on file.	PROPONENT / EAP	MET
MARBLE QUARRYING				
The primary source of noise from extraction of aggregate and dimension stone is from earth-moving equipment, processing equipment, and blasting.	<ul style="list-style-type: none"> Ø Landscaping, berms, and stockpiles can be constructed to form sound barriers. Ø Noisy equipment (such as crushers) can be located away from populated areas and can be enclosed in sound-deadening structures. Ø Conveyors can be used instead of trucks for in-pit movement of materials. 	Noise monitoring plan is on file. Occupational health policy is on file.	PROPONENT / EAP	MET
The truck traffic that often accompanies mining can be a significant noise source.	Ø Noisy operations can be scheduled or limited to certain times of the day.	Noise monitoring plan is on file. Occupational health policy is on file.	PROPONENT / EAP	MET

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Expansion Phase

NOISE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
SOLAR SALT OPERATIONS				
Noise impact of expansion activities at the salt pan is expected to be negligible provided industry standards are maintained.	<p>No noise measurements as part of a monitoring programme are deemed necessary.</p> <p>If complaints regarding noise are received:</p> <ul style="list-style-type: none"> Ø Measure noise levels in surrounding areas attributable to the plant under various operating conditions and at various times; Ø Investigate and, if required, implement further noise reduction measures. <p>Maintain all sound proofing, silencers and other equipment in good working order to minimise excess noise.</p>	<p>Monitoring:</p> <ul style="list-style-type: none"> Ø Keep a register of all complaints received and remediation action taken. Ø Compile all information in an annual report. <p>Performance Indicator:</p> <p>Number of registered complaints</p>	ECO	PROPONENT / Ministry of Labour
MARBLE QUARRYING				
Construction activities that can cause noise include: removing overburden, drilling, blasting, removal of vegetation.	<p>It is recommended that, as far as is feasible, noise generating activities be limited to day-time hours (considered to be between 07:00 and 18:00) since noise impacts are most significant during the night. This includes:</p> <ul style="list-style-type: none"> Ø Limiting all construction activities to day-time hours; Ø Limiting truck and other vehicle activity to and from the mining site during the operational phase to day-time hours. Ø Vibrating equipment must be on vibration isolation mountings. Ø The site layout should be designed in such a manner that the noisiest sections of the plant are at the centre of the site, using surrounding buildings as noise attenuation shields. Ø A mechanism to monitor noise levels, record and respond to complaints and mitigate impacts should be developed. 	<p>Monitoring:</p> <ul style="list-style-type: none"> Ø Keep a register of all complaints received and remediation action taken. Ø Compile all information in an annual report. <p>Performance Indicator:</p> <p>Number of registered complaints</p>	ECO	PROPONENT / Ministry of Labour

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Operational Phase

NOISE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
SOLAR SALT OPERATIONS				
Noise impact of operational activities at the salt pan is expected to be negligible.	<p>No noise measurements as part of a monitoring programme are deemed necessary.</p> <p>If complaints regarding noise are received:</p> <ul style="list-style-type: none"> Ø Measure noise levels in surrounding areas attributable to the plant under various operating conditions and at various times; Ø Investigate and, if required, implement further noise reduction measures. <p>Maintain all sound proofing, silencers and other equipment in good working order to minimise excess noise.</p>	<p>Monitoring:</p> <ul style="list-style-type: none"> Ø Keep a register of all complaints received and remediation action taken. Ø Compile all information in an annual report. <p>Performance Indicator:</p> <p>Number of registered complaints</p>	ECO	PROPONENT / Ministry of Labour
MARBLE QUARRYING				
<p>The operational phase will include the following sources of noise:</p> <p>Pumps, compressors, fans, mixers and electrical motors associated with the process;</p> <p>Road traffic; and</p> <p>General commercial and light industrial activities.</p>	<p>All moving parts of machines should be properly lubricated;</p> <p>Non-moving parts of machines should be properly fastened;</p>	<p>A mechanism to monitor noise levels, record and respond to complaints and mitigate impacts should be developed.</p>	ECO	PROPONENT / Ministry of Labour
GUANO HARVESTING				
<p>There is a possibility that noise generated during the maintenance of platforms will disrupt the roosting patterns of birds which will reduce the production rate of guano over 18 months.</p>	<p>Ensure that any maintenance of platforms is done when birds are not present in large numbers</p>	<p>Ø Compile all information in an annual report.</p>	ECO	PROPONENT / Ministry of Labour
	<p>Any operations occurring within ML 66J should not occur near the guano platforms to not disturb roosting birds, sufficient buffer distance should be created to allow the saltpan area to remain as much as a natural environment as possible.</p>		ECO	PROPONENT / Ministry of Labour
OYSTER FARMING				
Minimal noise is associated with oyster farming activities.	Oyster farming should only occur in the designated salt pans within the ML66J and not in the sea opposite the pans. Negligible noise is created through oyster farming methods.	No monitoring of noise levels is deemed necessary for the oyster farming activities.	ECO	PROPONENT

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Decommissioning Phase

NOISE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
Machinery used during this phase could create excessive noise.	Machinery is to be maintained in a state that ensures no excessive noise is created.	A register of complaints should be kept on file.	PROPONENT	MET / MME
The impact significance associated with the decommissioning phase will be less depending on potential changes to the ambient noise levels over the life of the projects.	Personnel are to wear PPE to reduce the exposure to noise levels in excess of 85dbs	A summary of the issues should be included in the annual report.		

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Table 3. Potential Visual Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L, during Planning, Expansion, Operational and Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

VISUAL MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring / Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS				
Location of access road resulting in negative impact on the environment.	The current site access road was established decades earlier and is fully operational. Signage indicates the turn off to the solar salt operations.	Maintain existing access road.	PROPONENT	Roads Authority
Visual impact of inappropriate siting of crystallisers, wash dams and channels, salt processing plant, accessory works. Mine processing plant is very remote with no residential areas within a 3km radius. Impacts are negligible or insignificant.	Mitigations need to be planned. The infrastructure should not be very visible to the general public making use of any nearby main roads.	Visual baseline in the form of a photo survey should be undertaken.	PROPONENT / EAP	MET
MARBLE QUARRYING				
The removal of vegetation leaves area bare and stripped of topsoil.	Plan for the stockpiling of top soil (if relevant) should not exceed 2.5m. Topsoil can be replaced at decommissioning.	Visual baseline in the form of a photo survey should be undertaken.	PROPONENT / EAP	MET
GUANO HARVESTING				
New guano platforms that are planned should blend into the background and be inconspicuous	The platforms should be made of wood and not painted with bright colours.	Visual baseline in the form of a photo survey should be undertaken.	PROPONENT / EAP	MET

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Expansion Phase

VISUAL MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring / Competent Authority
EXPANSION PHASE				
SOLAR SALT OPERATIONS				
Visual impact of increasing the number of crystalliser ponds could affect tourism. Unlikely to affect tourism activities due to remoteness of the ML66J area. The boundaries of each crystalliser pond will not exceed 5m above the pan surface. Additional pans would attract more birdlife which would benefit tourism	Ensure site area is organised and clear of solid wastes; Restricted access for public safety reduces exposure of the solar salt operations to tourists; access by visitors for a tour of the operations must be by appointment;	Carry out audits and report findings; Keep a visitors' log	PM / ECO	PROPONENT

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Operational Phase

VISUAL MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring / Competent Authority
OPERATIONAL PHASE				
SOLAR SALT OPERATIONS				
Visual impact of increasing the number of crystallisers at the pan on tourism. Unlikely to affect tourism activities due to remoteness of the ML66J area. The boundaries of each crystalliser will not exceed 5m above the pan.	Ensure site area is organised and clear of solid wastes; Restricted access for public safety reduces exposure of the solar salt operations to tourists; access by visitors for a tour of the operations must be by appointment; access to actual expansion area sites is prohibited. Bird watching from the perimeter of the pans within the mining licence area is permissible. Access roads to popular fishing spots allow for this bird watching activity.	Carry out audits and report findings; Keep a visitors log	PM / ECO	PROPONENT
MARBLE QUARRYING				
Impact to visual resources would be considered unfavourable if the landscape is significantly degraded or modified. The current quarrying activities occur in shallow pits of up to 4m.	Once quarrying is complete ensure that all shallow pits are covered up.	Visual baseline in the form of a photo survey should be undertaken.	PROPONENT / EAP	MET

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Decommissioning Phase

VISUAL MANAGEMENT PLAN				
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DECOMMISSIONING PHASE				
SOLAR SALT AND QUARRYING OPERATIONS				
Access roads to and haulage roads within the ML66E, F&J areas inside the Dorob National Park could leave tracks that persist in the environment for decades.	Confirm requirements of competent authority; Place signage prohibiting access and possibly barricade access roads to abandoned ML66J area. Ensure no new access roads are created and only existing tracks should be utilised.	Requirements for restricting or prohibiting access to the abandoned mine are on file. Required mitigations are actioned and proof filed in EMS filing system.	PROponent	MME / MET

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Table 4. Potential Socio-Economic Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. during Planning, Expansion, Operational And Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

SOCIO-ECONOMIC MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS				
Servicing of vehicles within ML66J area.	Plans to service vehicles within ML66J should be drawn up according to industry standards.	Plan on file	PROPONENT	MET
Inadequate planning and design of salt operations at the pans.	Solar salt operations at the pan must be planned and designed with minimal impact on the environment and pressure on natural resources e.g. use of ground water; communicate plans to the competent authorities.	Plans and amended plans are to be filed.	PROPONENT / EAP	MET / MME
No employees are accommodated within ML66J area.	Plans to accommodate personnel at a permanent accommodation camp should be drawn up according to the requirements of the competent authority. Locate and design staff housing with minimal impact.	Plan on file	PROPONENT	MET
MARBLE QUARRYING				
During construction, traffic volumes on the public roads to and from the mining site are likely to increase with the transport of construction workers, construction material, and equipment to site.	Erect appropriate road hazard / information signage to warn road users of the turning of heavy vehicles.	Plan on file	PROPONENT	MET
	Ensure that construction vehicles switch their headlights on, at all times.			

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Expansion Phase

SOCIO-ECONOMIC MANAGEMENT PLAN

Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
MARBLE QUARRYING				
Residential areas occur near the southern boundary of ML66J and no known developments are planned within the mining licence area.	There are no current plans to set up residential areas in the ML	Record any changes to the Municipal structure plans.	PROPONENT	MET

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Operational Phase

SOCIO-ECONOMIC MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
SOLAR SALT OPERATIONS				
Positive impact of short and long term employment for locals	Maximise employment of local labour where possible Careful attention to the recruitment of workers to ensure it is fair and also does not generate conflict.	Include the employee statistics in the annual audit showing long term trends.	PROPONENT	Ministry of Labour
Development of the salt pans restricting access and potentially limiting tourism opportunities.	Ensure that potential tourist sites can be easily accessed in the future even if expansion plans are to be implemented. Access to the saltworks would have to be arranged beforehand so that public safety is maintained. Access to the ML66,E,F,G,H,I&J area where tourists can learn about the process could potentially be allowed but only by appointment. A visitor's centre would need to be developed. Public safety would have to be prioritised for such tours and some areas would be off limits.	A public relations report should document the mine site visits and the use of the access road to the pans or to the beach passed the pans.	ECO	PROPONENT
MARBLE QUARRYING				
During operations, the volume of traffic will be significantly less as fewer employees are anticipated,	Keep a record of the truck traffic volumes hauling ore from the mining site	Keep a complaints register and incident register on file.	PROPONENT	MET
OYSTER FARMING				
The project may help to improve agricultural production by way of proving additional income to the farmers.	Maximise agricultural activities where possible for the benefit of the economy	Record trends in sales and employment figures.	PROPONENT	MET
Positive impact of short and long term employment for locals	Maximise employment of local labour where possible Careful attention to the recruitment of workers to ensure it is fair and also does not generate conflict.	Include the employee statistics in the annual audit showing long term trends.	PROPONENT	Ministry of Labour

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Decommissioning Phase

SOCIO-ECONOMIC MANAGEMENT PLAN

Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
Negative impact of short term employed locals losing their jobs once a phase / the project draws to an end.	Maximise employment of local labour for long term periods where possible Careful attention to the recruitment of workers to ensure it is fair and also does not generate conflict.	Include the employee statistics in the annual audit showing long term trends.	PROPONENT	Ministry of Labour

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Table 5. Potential Biodiversity Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. During Planning, Expansion, Operational And Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

BIODIVERSITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS				
Potential damage to the natural environment of ML66G,H,I&J resulting in loss of biodiversity.	<ul style="list-style-type: none"> ➢ Undertake EIA study; ➢ Write up EIA Report; ➢ Draft an EMP; ➢ Plan an EMS; ➢ Renewal or Update EIA Report 	Record of Decision / EMP approved – documents filed. Schedule to develop EMS documentation on file.	PROPONENT / EAP	MET/ MME
Awareness of public and government departments regarding the SaltCo's operations and routine expansion plans for ML66G,H,I&J solar salt operations. Operations have existed for decades and all neighbours and stakeholders are aware of the solar salt operations.	Public consultation with all key stakeholders was deemed unnecessary for the Baseline EIA Report because of the sustainable nature of the solar salt operations and the fact that operations have gone on for decades and all stakeholders are aware of the extent of solar salt operations at Cape Cross.	Environmental Clearance Certificate should be filed.	PROPONENT / EAP	MET
MARBLE QUARRYING				
Rock is removed by quarrying, along with any sediments it may have contained. The habitat is modified. Habitation of excavations may take a very long time.	Plan the mining so as to reduce the size of the footprint but maximise the resource utilisation.	Record of Decision / Environmental Clearance Certificate / EMP approved – documents filed. Schedule to develop EMS documentation on file.	PROPONENT / EAP	MET

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Expansion Phase

BIODIVERSITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
SOLAR SALT OPERATIONS				
Solar salt operations are occasionally expanded through the increase in the number of crystallisers. Expansions beyond the boundaries of the ML66J area may potentially affect ecosystem services negatively. The plans for expanding current crystallisers do not extend beyond borders of the ML66J boundary.	Plans to develop more crystallisers within ML66J have left sufficient buffer distances between the proposed ponds. See the map provided in the EIA report.	Check that actual crystalliser pond layout matches map. This should be done before the start of any expansions. Check list updated weekly and filed.	PM	PROPONENT
Loss and/or destruction of natural areas	Confine expansion activities to the demarcated maintenance/staff building area.	Monitor compliance and file report	PM / ECO	PROPONENT
MARBLE QUARRYING				
The significant impact of mining is land degradation due to pits, roads, dumps of waste rocks, site services	All requisite mitigation measures will be practiced to minimize the impact of land degradation	Monitor compliance and file report	PM / ECO	PROPONENT

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Operational Phase

BIODIVERSITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
SOLAR SALT OPERATIONS				
The discharge of bitterns at the high water mark at the discharge pipe could affect the biodiversity of the intertidal fauna. The footprint of the impact is very small. The dynamic nature of the coastline ensures rapid dilution of the bitterns. The impact is deemed negligible.	<ul style="list-style-type: none"> ➤ The bitterns could be discharged with fresher seawater from the evaporation ponds. 	<ul style="list-style-type: none"> ➤ The discharge site could be monitored for the abundance of micro fauna living in the sands. The results could be compared to any baseline results or current sites north and south of the discharge point. 	ECO	PROPONENT / MET / MFMR
	<ul style="list-style-type: none"> ➤ An effluent discharge permit is to be renewed periodically and the conditions adhered to. 	<ul style="list-style-type: none"> ➤ The effluent discharge permit must be filed with other documents issued by the competent authorities. 		
MARBLE QUARRYING				
The impact on biodiversity is thought to be minimal	Biodiverse habitats should be avoided.	The mining area that is being affected is not a high biodiversity habitat.	ECO	PROPONENT / EAP / MET
OYSTER FARMING				
Introduction of alien species to the marine environment could affect biodiversity. No known affects have been documented by the MFMR from the aquaculture activities currently taking place in Walvis Bay. The Richwater Oyster Farm is contained within the manmade, landbased salt pans.	Note any changes to the intertidal habitats adjacent to the salt works.	Keep all records and findings on file	PM/ ECO	PROPONENT / EAP / MET
GUANO HARVESTING				
Impact on breeding birds on the platforms	Reduce the harvesting times and undertake harvesting when birds are not breeding or have migrated to other areas.	Plan on file	PM/ ECO	PROPONENT / EAP / MET

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Decommissioning Phase

BIODIVERSITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
MARBLE QUARRYING				
If reclamation and rehabilitation of mine site does not take place the habitats for the re-establishment of organisms may be reduced.	Plan to rehabilitate of the mine site after the operation come to an end so that organisms can re-establish themselves within the mining licence area.	Mine closure plan to be developed and put on file.	PROPONENT	MET / MME
OYSTER FARMING				
The closure of the mine would most likely include the decommissioning of the seawater intake pumps. This would result in the eventual drying out of the constructed salt pans. Thus oyster farming would cease or no longer be viable. There is no risk that the oysters will enter the marine ecosystem at this time unless artificially introduced by the proponent.	Care should be taken to remove all possibilities of oysters entering the local marine ecosystem.	The mitigation is included in the closure plan of the oyster farm.	ECO	PROPONENT / MET / MFMR
GUANO HARVESTING				
The mine closure plan should include this aspect in planning. The birds that nest on the platforms will need to use this habitat continually.	The artificially created environment must be sustained and managed beyond mine closure to ensure that the biodiversity is maintained.	The mitigation is included in the mine closure plan and the mine closure plan is on file.	ECO	PROPONENT / MET

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Table 6. Potential Health and Safety Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. during Planning, Expansion, Operational and Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

HEALTH AND SAFETY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
The potential impacts on human health and safety resulting from operations could include occupational accidents and injuries, vehicle accidents, exposure to weather extremes, trips and fall on uneven terrain, adverse health effects from dust generation and emissions, and contact with hazardous materials.	➤ Draw up operational procedure manuals	A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that incidents do not repeat themselves.	PM/ ECO	Ministry of Labour / PROPONENT
	➤ Provide health and safety awareness training			
	➤ Establish practical standard housekeeping rules			

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Expansion Phase

HEALTH AND SAFETY MANAGEMENT PLAN

Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
Increased risk for road accidents with increased vehicle movements.	Install road traffic signs warning public of construction vehicles in the area. This is only necessary where the public road and the access road meet. Construct new intersection with turning and acceleration lanes	Intersection is fully functional	ECO	PROPONENT

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Operational Phase

HEALTH AND SAFETY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
Road safety for road users.	<ul style="list-style-type: none"> > Maintain vehicles > Obey traffic rules > No over loading > Ensure licenses are valid (vehicles and operators) 	<ul style="list-style-type: none"> Monitoring reports on file Non-compliances reported and on file 	PM/ ECO	Roads Authority / Traffic Police
Movement and presence of vehicles (bulldozers, front-end loaders, trucks) on and around the pan and mining site presents risks of accidents due to collisions or unstable substrate. This poses risks to personnel safety and asset security.	<ul style="list-style-type: none"> > Coordinate movement of operational vehicles; > Operational distances to be maintained; > Maintain the integrity of roads; > Training of personnel. 	<ul style="list-style-type: none"> Operators certificates on file; File any incident reports; Schedule of road maintenance on file 	PM/ ECO	PROPONENT
Risk to health and safety of employees	<p>Maintain "good housekeeping". Hazardous substances, compressed gas cylinders and chemical products must be properly labelled and securely stored in locked containers or areas to prevent mixing or water contamination that would result in noxious gases, explosions or other worker hazards.</p> <p>Ensure that all operators and or maintenance crews on-site are familiar with the company's ERP or equivalent (Emergency Response Guide 2008).</p> <p>Conduct thorough safety training to personnel about the use of protective clothing, footwear, gloves and belts; safety goggles and shields; dust masks and respirators; the correct handling of materials and the safe use of all equipment.</p> <p>First aid treatment, emergency treatment and medical assistance must be available immediately.</p> <p>Regular inspections must be carried out to inspect and test fire-fighting equipment. Fire-fighting equipment must be readily accessible. Fire prevention considerations include fire doors, fire pumps, and emergency fuel-flow stopping devices. Escape routes must be protected during fire outbreaks.</p> <p>Provide medical assistance where needed.</p>	<ul style="list-style-type: none"> A register must be maintained of all training provided to staff. A register must be maintained for all safety equipment and medical supplies kept on site. This should include date of purchase and date of service/replacement for items that can expire or deteriorate with age. A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that incidents do not repeat themselves. Compile all monitoring information in an annual report. 	PM/ ECO	Ministry of Labour / PROPONENT

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Decommissioning Phase

HEALTH AND SAFETY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
Abandonment of the ML66E,F,G,H,I,J,K&L area potentially exposes public and wildlife to hazards. When a mine is abandoned the infrastructure and altered landscape can affect the safe access of wildlife and general public if not rehabilitated	<ul style="list-style-type: none"> ➤ All movable assets to be removed off site 	At the time of mine closure and abandonment the contractor must rehabilitate the mine site to the state agreed upon at the start of the agreement. Comparisons with the baseline report drafted at the start of the relationship must be made.	PROPONENT CONTRACTOR	MET / MME
	<ul style="list-style-type: none"> ➤ All waste to be removed from site 	<ul style="list-style-type: none"> ➤ Removal of contractor's movable assets i.e. plant equipment 		
	<ul style="list-style-type: none"> ➤ All buildings to be demolished and removed from site (unless permission is granted from MME/MET to allow the buildings to be used for next license holder or other land use stakeholder) 	<ul style="list-style-type: none"> ➤ Demolishment of contractor's fixed immovable assets 		
	<ul style="list-style-type: none"> ➤ All immovable machinery to be dismantled and removed from site 	<ul style="list-style-type: none"> ➤ Removal of this demolished plant and building rubble by contractor 		
	<ul style="list-style-type: none"> ➤ All plant concrete structures to be demolished and removed off site 	<ul style="list-style-type: none"> ➤ contractor to fill in dangerously deep pits or holes in the ground that poses a threat to the public safety 		
	<ul style="list-style-type: none"> ➤ All earth mounds around crystallisers / pits to be levelled to acceptably safe sloping angles. 	<ul style="list-style-type: none"> ➤ If such pits or holes are too large to fill the contractor must barricade such hazards to prevent any accidents 		
		<ul style="list-style-type: none"> ➤ The proponent is to fulfil the same rehabilitation tasks as above for all the accessory works area, including infrastructure, tailings, pits and holes etc. which they created before the Contractor began works within the ML66E,F,G,H,I,J,K&L area. 		

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Table 7. Potential Dust Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. during Planning, Expansion, Operational and Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

DUST MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS & GUANO HARVESTING				
Dust may be generated during the planning phase but this dust is expected to be insignificant compared to the ambient conditions.	It is recommended that regular dust suppression be included during, when dust becomes an issue. Personnel are to be issued with dust masks for health reasons when needed.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	PM/ ECO	Ministry of Labour / PROPONENT
MARBLE QUARRYING				
Dust may occur as fugitive dust from excavation, from haul roads, and from blasting, or can be from point sources, such as drilling, crushing and screening	It is recommended that regular dust suppression be included during, when dust becomes an issue. Personnel are to be issued with dust masks for health reasons when needed.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	PM/ ECO	Ministry of Labour / PROPONENT

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Expansion Phase

DUST MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
SOLAR SALT OPERATIONS & GUANO HARVESTING				
Dust may be generated during the expansion phase but this dust is expected to be insignificant compared to the ambient conditions.	It is recommended that regular dust suppression be included during expansion, when dust becomes an issue. Personnel are to be issued with dust masks for health reasons when needed.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. Report on each expansion period	PM/ ECO	Ministry of Labour / PROPONENT
MARBLE QUARRYING				
Dust may occur as fugitive dust from excavation, from haul roads, and from blasting, or can be from point sources, such as drilling, crushing and screening during expansion.	It is recommended that regular dust suppression be included during, when dust becomes an issue. Personnel are to be issued with dust masks for health reasons when needed.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	PM/ ECO	Ministry of Labour / PROPONENT

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Operational Phase

DUST MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring / Competent Authority
OPERATIONAL PHASE				
SOLAR SALT OPERATIONS GUANO HARVESTING				
Generation of dust from high traffic volumes on haul road is expected to be negligible.	The C34 is a salt road and well maintained. Very little dust is created from driving on these roads. High vehicle speed increases the amount of dust stirred up from unpaved roads. Lowering the speed of the vehicle can reduce emissions significantly. The trucks will not travel above the speed limit as per the trucks payload type and the permit stipulations.	Register of complaints on file.	PM/ ECO	Roads Authority / Traffic Police
MARBLE QUARRYING				
Site conditions can affect the impact of dust generated during extraction of aggregate and dimension stone	The following measures can be put in place to reduce dust: <ul style="list-style-type: none"> ➢ Regular spraying of water by water sprinkling system over haulage roads.. ➢ Periodic maintenance of haulage road ➢ All over burden dumps can be stabilized with legumes and grass to prevent the erosion of soil and arrest the dust emission during windy days. 	Register of complaints on file.	PM/ ECO	Roads Authority / Traffic Police

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Decommissioning Phase

DUST MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
Dust may be generated during the decommissioning phase but this dust is expected to be insignificant compared to the ambient conditions.	It is recommended that regular dust suppression be included during, when dust becomes an issue. Personnel are to be issued with dust masks for health reasons when needed.	Regular visual inspection. A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.	PM / ECO	Ministry of Labour PROPONENT

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Table 8. Potential Waste Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. during planning, expansion, operational and decommissioning phases. (Authority refers to the responsible person / party)

Planning Phase

WASTE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
Waste disposal sites	Weekly removal of waste to Swakopmund refuse dump. Materials that could be incinerated should be burnt on site. A maintenance plan of the incineration pit should be drawn up if necessary.	Waste Management Plan on file	PROPONENT	MET
Machinery maintenance poses risks of pollution.	Accessory works application drawn up as per plan in the EIA and submitted Locate equipment and buildings appropriately and plan installation of structures to avoid localised pollution (e.g. workshop with oil water separators or sumps for safe removal to hazardous waste sites and bund structures below stationery machinery where necessary).	Accessory works application submitted and receipt kept on file Plan on file	PROPONENT	MME
Sewerage facilities are currently portable facilities at the processing plant.	Plan for more permanent structures to deal with sewerage and devise a programme for regular removal of waste to Swakopmund sewerage treatment facility.	Waste Management Plan on file	PROPONENT	Swakopmund Municipality
Sewerage facilities for an accommodation camp are not needed at present as no personnel stay at the mine	Plan for the expansion of septic tanks or French drains in the event an accommodation camp is required in the future.	Waste Management Plan on file Application for effluent discharge submitted to competent authority and receipt on file	PROPONENT	DWAF
MARBLE QUARRYING				
Machinery maintenance poses risks of pollution.	Locate equipment and buildings appropriately and plan installation of structures to avoid localised pollution (e.g. workshop with oil water separators or sumps for safe removal to hazardous waste sites and bund structures below stationery machinery where necessary).	Plan on file	PROPONENT	MME

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Expansion Phase

WASTE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
ALL ACTIVITIES				
Sanitation	Ensure adequate sewage and sanitation management for expansion workers. The contractor must provide suitable sanitary arrangements for the expansion personnel. A minimum of 1 toilet will be provided per 15 persons at each working area. The contractor must maintain, keep clean, neat and hygienic all site sanitation facilities.	Monitor compliance and file report	PM / ECO	PROPONENT
Solid waste disposal	Manage solid waste disposal.	Monitor compliance and file report	PM / ECO	PROPONENT
Hazardous waste disposal	Ensure spillage does not occur.	Hazardous waste certificate from hazardous waste dump in Walvis Bay on file.	PM / ECO	PROPONENT

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SALTCOMPANY (PTY) LTD

Operational Phase

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WASTE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
ALL ACTIVITIES				
Pollution from solid waste	<p>Develop a Waste Management Plan, outlining:</p> <ul style="list-style-type: none"> ➢ Expected type and amount of waste; ➢ Measures to reduce waste; ➢ Type and expected volume of recyclable waste; ➢ Recycling facilities that will collect/receive waste; ➢ Type of storage for different waste types; ➢ Collection and transport of waste; and ➢ Monitoring procedures to ensure the waste management plan is implemented. <p>The following actions should enable the effective management of waste, preventing pollution within the ML:</p> <ul style="list-style-type: none"> ➢ Ensure that no material used at the site enters the surrounding environment; ➢ Aim to minimise waste through reducing and re-using (e.g. packaging, metal scrap) material; ➢ Collect recyclables separately and deliver these to suitable facilities or arrange for collection; ➢ Prevent littering by staff at work sites by providing bins or waste bags in sufficient manner; ➢ Provide separate bins for hazardous / polluting materials and mark these clearly; <p>Store hazardous / polluting materials on impermeable ground until it is disposed of / collected.</p>	<p>Monitoring:</p> <ul style="list-style-type: none"> ➢ Regular inspection of waste collection and disposal areas. ➢ Check and file waste disposal slips. ➢ Compile all monitoring information in an annual report and audit this report against the waste management plan. <p>Performance Indicators:</p> <ul style="list-style-type: none"> ➢ Availability of plan ➢ Extent to which plan is complied with ➢ Presence of litter within the area and surrounding land ➢ Availability of rubbish bins and skips ➢ Total volume of general and hazardous waste storage capacity ➢ Total volume of general and hazardous waste stored on site ➢ Degree to which different waste is separated Frequency of waste collection 	PM/ ECO	PROPONENT
Servicing of vehicles outside the vehicle maintenance building. Oils and lubricants penetrating soil surface.	<p>All vehicles must be serviced in a designated area inside the maintenance building.</p> <p>Catch trays must be installed.</p>	<p>Monitor maintenance workshop and wash bays for compliance and file reports.</p>	PM/ ECO	PROPONENT
Oil or diesel spills	In the event of an oil/fuel spill, the spill must be cleaned up immediately and deposited at a registered hazardous waste landfill site in Walvis Bay. Refer to ERP.	<p>Emergency Response Plan on file.</p> <p>Hazardous waste disposal certificate on file.</p>	PM/ ECO	PROPONENT
Inappropriate disposal of waste around accommodation camp site.	<p>Designate restricted places for eating in working areas, and provide adequate refuse bins.</p> <p>Implement Waste Management Plan</p>	Monitor compliancy and report on file.	PM/ ECO	PROPONENT
MARBLE QUARRING				
The nature of overburden and waste rock is weathered dolomite and sandy soil. Mine waste consists of discontinuity of dolomite waste unusable pieces of marble which will be generated during extraction of marble blocks.	Any waste that is generated will be dumped in designated dump site areas.	Monitor compliancy and report on file.	PM/ ECO	PROPONENT

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Decommissioning Phase

WASTE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
When all activities come to an end, no waste or litter should be present on site.	All waste to be removed from site	Monitor compliancy and report on file.	PM/ ECO	PROPONENT

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Table 9. Potential Impacts on Water Quality of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. During Planning, Expansion, Operational and Decommissioning Phases. (Authority refers to the responsible person / party
Planning Phase

WATER QUALITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
Possible impacts to marine water quality and sediments through hydrocarbon pollution by marine construction infrastructure and discharge	Plan for structures to deal with possible pollution of water in rare instances. .	Waste Management Plan on file Application for effluent discharge submitted to competent authority and receipt on file	PROPONENT	DWAF
The main source of water used for the projects will be sea water	Only sea water is pumped out of the ocean to join the crystallisers natural flow and if required to be utilised when mining marble.	Monitor water use and report on file.	PM/ ECO	PROPONENT

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Expansion Phase

WATER QUALITY MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
Potential contamination of marine waters and sediments by inappropriate disposal of soil and/or surplus rock from construction activities or backfilling used lubricating oils from marine machinery maintenance and human wastes, which could in turn lead to impacts upon marine flora, fauna and habitat.	Ensure adequate disposal, sewage and sanitation management for expansion workers.	Monitor compliance and file report	PM/ECO	PROPONENT

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Operational Phase

WATER QUALITY MANAGEMENT PLAN

Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
Groundwater (salt pan brine) contamination by oil, grease, fuel, sewerage.	<p>Prevention:</p> <ul style="list-style-type: none"> ➤ Control storage, collection, disposal and recycling of potential pollutants; ➤ Maintain bunds, concrete surfaces and sealed containers; ➤ Ensure vehicles and equipment are well maintained <p>Mitigation:</p> <ul style="list-style-type: none"> ➤ Devise safe handling procedures. ➤ Communicate response procedures for accidental spills; ➤ Ensure all equipment is available for dealing with accidental spills; ➤ Create an Emergency Response Plan (ERP); ➤ File MSDS in ERP; ➤ Monitor water quality from test holes (if relevant); ➤ Provide awareness training 	<p>Administration of EMS documentation:</p> <ul style="list-style-type: none"> ➤ All certificates for hazardous waste disposal filed; ➤ Checklists and schedule for auditing compliance to the EMP are filed ➤ Reports are filed; ➤ Awareness training attendance lists signed and filed. 	ECO	PROPONENT / DWAF
Pollution of groundwater supplies	Specific ground sealing and drainage is required around fuel depots and ablation blocks to prevent runoff affecting groundwater. See section above. Specific methods of drilling, cutting / blasting should be employed so as not to contaminate sources of water.	Monitor oil water separators, oil sumps, bunds and assess compliance and file reports.	PM/ ECO	PROPONENT
Pressure on local water resources. Water for drinking purposes must be imported to the site.	Implement water saving strategies.	Monitor water use and report on file.	PM/ ECO	PROPONENT

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Decommissioning Phase

WATER QUALITY MANAGEMENT PLAN

Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
Any runoff water from stockpiles and the mine area can be collected for the removal of sediments before disposal. Waste water should be collected in sump, should not be reused or disposed of in water bodies to avoid water pollution	If feasible check dams can be constructed in gullies to arrest silt in runoff water, so there would be negligible pollution due to activity at the mine site Public health shouldn't be affected as the water used should not be made available for human consumption	Monitor water use and report on file.	PM/ ECO	PROPONENT / DWAF

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Table 10. Potential Impacts on Marine Ecology of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming at ML66E,F,G,H,I,J,K&L. during Planning, Expansion, Operational and Decommissioning Phases. (Authority refers to the responsible person / party)

Planning Phase

MARINE ECOLOGY IMPACTS				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
PLANNING PHASE				
SOLAR SALT OPERATIONS				
Any issues associated with the location of the crystallisers, wash water dams, accessory works and the associated discharge pipelines leading to and from the ocean should potentially impact on intertidal and shallow subtidal biota during the construction phase	Plan a comprehensive environmental awareness programme amongst contracted personnel. Restrict disturbance of the intertidal and subtidal areas to the smallest area possible.	Planning reports and the mitigation action check list on file.	PM/ ECO	PROPONENT
MARBLE QUARRYING				
Quarrying can substantially modify the routing of recharge and water quality may be degraded thus degrading the quality of the ecosystem	Plan a comprehensive environmental awareness programme amongst contracted personnel. Ensure the proponent has measures in place to mitigate any damages to the marine environment by ensuring mining sites are at a distance from any water body.	Planning reports and the mitigation action check list on file.	PM/ ECO	PROPONENT
OYSTER FARMING				
Appropriate siting of an aquaculture development such as oyster ponds is critical to avoiding and reducing many potential adverse ecological effects, and may also result in enhancing the positive effects of the activity	Proposed sites should be researched on first to avoid sensitive, diverse or non-tolerant habitats and species especially to human activities	Planning reports and the mitigation action check list on file.	PM/ ECO	PROPONENT

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Expansion Phase

MARINE ECOLOGY IMPACTS				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
EXPANSION PHASE				
The construction and installation of discharge pipelines intakes and discharge, accessory works, crystallisers (construction site, pipe lay-down areas, and trenching in the marine environment, vehicular traffic on the beach and poses consequent disturbance of intertidal and subtidal biota).	The proponent should ensure all expansion processes are carried out as they are stated on file.	Monitoring reports and the mitigation action check list on file.	PM/ECO	PROPONENT

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Planning Phase

MARINE ECOLOGY IMPACTS				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
OPERATIONAL PHASE				
Any release of liquid hydrocarbons has the potential for direct, indirect, and cumulative effects on the marine environment through contamination of the water and/or sediments. These effects include physical oiling and toxicity impacts to marine fauna and flora, localised mortality of plankton, pelagic eggs and fish larvae, and habitat loss or contamination	The ECO should conduct a comprehensive environmental awareness programme amongst contracted construction personnel. Only equipment and vehicles actively involved in construction should be permitted on the associated works areas. When not in use, and overnight, all equipment and plant must be withdrawn; Refueling of equipment from a bowser should take place away from the beach and wet works areas;	Monitoring reports and the mitigation action check list on file.	PM/ ECO	PROPONENT
Litter can enter the marine environment. Inputs can be either direct by discarding garbage into the sea, or indirectly from the land when litter is blown into the water by wind.	<ul style="list-style-type: none"> ➢ Regularly clean up any spills during. ➢ No dumping of materials into the environment ➢ Ensure regular collection and removal of refuse and litter from intertidal areas. ➢ Have good house-keeping practices in place during construction. 	Monitoring reports and the mitigation action check list on file.	PM/ ECO	PROPONENT
Disturbance and destruction of marine biota through alteration and disruption of the coastal zone during quarrying, the disturbance of and possible injury to shore birds and marine biota through blasting. Impact is considered negligible.	Blasting should be carried out during times when limited flight movements occur.	Monitoring reports and the mitigation action check list on file.	PM/ ECO	PROPONENT

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Decommissioning Phase

MARINE ECOLOGY IMPACTS				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
DECOMMISSIONING PHASE				
The potential impacts during the decommissioning phase are thus expected to be minimal, and no key issues related to the marine environment are identified at this stage, since cessation in the operation of all activities.	The proponent should ensure all decommissioning processes are carried out as they are stated on file	Monitoring reports and the mitigation action check list on file.	PM/ ECO	PROPONENT

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Table 10. Potential Archaeological and Heritage Impacts of Solar Salt Operations, Marble Quarrying, Guano Harvesting and Oyster Farming in ML66E,F,G,H,I,J,K&L. (Authority refers to the responsible person / party)

ARCHAEOLOGICAL / HERITAGE MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
No trace of any archaeological or historical remains as relevant to the National Heritage Act 27 of 2004, occur in the ML66 areas.	A photographic record of the ML66E,F,G,H,I & J should be taken. The proponent should be made aware of the provisions of Section 55 (4) of the National Heritage Act setting out the requirement that any sites or remains found in the course of planning and related work should be reported to the authorities as soon as possible.	This assessment is based on the presence or absence of visible surface indications, on inference from other parts of the Namib coast and it is suggested that the project areas are in no way sensitive archaeologically.	PROPONENT / ECO	National Heritage Council / Ministry of Education Arts and Culture

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Table 11. General Decommissioning Requirements as Stipulated in the Minerals Act

DECOMMISSIONING MANAGEMENT PLAN				
Nature of Environmental Impact / Aspect / Risk	Mitigation / Enhancement Measure	Monitoring Measure / Control / Tool / Performance Indicator	Responsible Implementing Authority	Monitoring Competent Authority
Risks associated with abandoning a mine without rehabilitating according to an approved plan:	Minerals Act:	At the time of mine closure and abandonment the contractor must rehabilitate the mine site to the state agreed upon at the start of the agreement. Comparisons with the baseline report drafted at the start of the relationship must be made.	PROPONENT	MET / MME
Minerals Act: Section 54	Section 54	➤ Removal of movable assets i.e. plant equipment		
Any person who contravenes or fails to comply with the provisions of subsection (2) shall be guilty of an offence and on conviction be liable to a fine not exceeding R8 000 or to imprisonment for a period not exceeding 12 months or to both such fine and such imprisonment.	Abandonment of mining areas	➤ Demolishment of fixed immovable assets		
Contractual Agreements	The holder of a mineral licence may abandon the mining area by notice in writing addressed and delivered to the Commissioner who in turn will notify the license holder that the mine has been abandoned as from the date of the cancellation notice.	➤ Removal of this demolished plant and building rubble		
The Contractor's failure to meet the obligations as stipulated in the contractual agreement with regards to rehabilitation will incur penalties to the value of the cost of rehabilitating the ML66E-J area to a state agreed upon by the Contractor and Proponent at the start of the contractual agreement.	(2) The holder of the mineral licence to which such area relates shall:	➤ Fill in dangerously deep pits or holes in the ground that poses a threat to the public safety		
	➤ demolish any accessory works erected or constructed by such person in such area, except in so far as the owner of the land retains such accessory works on such conditions as may mutually be agreed upon between such owner and person and remove from such land all debris and any other object brought onto such land;	➤ If such pits or holes are too large to fill, barricade such hazards to prevent any accidents		
	➤ take all such steps as may be necessary to remedy to the reasonable satisfaction of the Minister any damage caused by any mining operations carried on by such holder to the surface of, and the environment on, the land in the area in question.	➤ The proponent is to fulfil the same rehabilitation tasks as above for all the accessory works area, including infrastructure, tailings, pits and holes etc. which they created before the contractor began works within the ML66 E-L area.		
	The abandonment of a mining area shall not affect any legal proceedings instituted against such holder or any obligation or liability of such holder in terms of the provisions of the Act.	➤ It is understood that the overburden removed for the creation of the crystalliser ponds would remain in the disposal area and that the crystalliser ponds and roads would remain in place. It will not be required to have the pan levelled (tailings and roads replaced within the created ponds) by either the proponent or contractor.		
		➤ It is understood that the abandoned ML11 area could be started up again by another license holder and solar salt operations are started on the pans provided the brine infiltration process continues as it has until now and for the duration of the current and future mining. In this case no rehabilitation of the crystallizing ground will be required.		

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