



**PROPOSED PHOTOVOLTAIC POWER PLANT OF TERASUN
ENERGY (PTY) LTD AT ARANDIS, ERONGO REGION**

ENVIRONMENTAL MANAGEMENT PLAN



Prepared for: TeraSun Energy (Pty) Ltd

May 2022

DOCUMENT CONTROL

Report title	Environmental Management Plan (EMP) for the proposed PV Power Plant of TeraSun Energy (Pty) Ltd at Arandis
Author	Pierré Smit
Reviewer	Werner Petrick
Client	TeraSun Energy (Pty) Ltd
Project Number	NSPTS20224
Report Number	1
Status	Final for public review
Issue Date	May 2022

DISCLAIMER

Neither the author nor Namisun Environmental Projects and Development (Namisun) have any business, personal, financial, or other interest in the proposed project apart from fair remuneration for environmental consulting work performed. The content of this report is based on the author's best scientific and professional knowledge, input from specialists, as well as available information. Namisun accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on this document.

Project information contained herein is based on the interpretation of data collected and data provided by the client, accepted in good faith as being accurate and valid. Namisun reserves the right to modify the report in any way deemed necessary should new, relevant, or previously unavailable or undisclosed information become available that could alter the assessment findings. This report must not be altered or added to without the prior written consent of the author.

ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE PROPOSED PHOTOVOLTAIC POWER PLANT OF TERASUN ENERGY (PTY) LTD AT ARANDIS

CONTENTS

1. INTRODUCTION	1-1
2. LEGAL FRAMEWORK.....	2-1
2.1 PERMITS.....	2-2
3. DETAILS OF PERSONS WHO PREPARED THIS EMP	3-1
4. SCOPE OF THE EMP	4-1
4.1 INDUCTION AND ENVIRONMENTAL AWARENESS TRAINING.....	4-2
4.2 SOCIAL AND ENVIRONMENTAL MANAGEMENT SYSTEM	4-2
5. ENVIRONMENTAL OBJECTIVES.....	5-1
6. PROJECT OVERVIEW.....	6-1
6.1 CONSTRUCTION PHASE	6-1
6.2 OPERATIONAL PHASE.....	6-1
6.3 DECOMMISSIONING AND CLOSURE	6-1
7. MANAGEMENT AND MITIGATION PLANS	7-1
7.1 STAKEHOLDER MANAGEMENT AND MITIGATION PLAN.....	7-1
7.1.1 INTRODUCTION	7-1
7.1.2 MANAGEMENT AND MITIGATION COMMITMENTS RELATING TO STAKEHOLDERS.....	7-2
7.2 SAFETY AND SECURITY MANAGEMENT	7-3
7.2.1 INTRODUCTION	7-3
7.2.2 RELEVANT FACILITIES / ACTIVITIES	7-3
7.2.3 SAFETY AND SECURITY MANAGEMENT PLAN	7-4
7.3 SOIL MANAGEMENT.....	7-5
7.3.1 INTRODUCTION	7-5
7.3.2 RELEVANT FACILITIES / ACTIVITIES	7-5
7.4 SOIL MANAGEMENT AND MITIGATION PLAN.....	7-5
7.5 BIODIVERSITY (FAUNA AND FLORA) MANAGEMENT.....	7-8
7.5.1 INTRODUCTION	7-8
7.5.2 RELEVANT FACILITIES / ACTIVITIES	7-8
7.5.3 BIODIVERSITY MANAGEMENT AND MITIGATION PLAN.....	7-9
7.6 SURFACE AND STORMWATER MANAGEMENT	7-12
7.6.1 INTRODUCTION	7-12
7.6.2 RELEVANT FACILITIES / ACTIVITIES	7-12
7.6.3 SURFACE AND STORMWATER MANAGEMENT AND MITIGATION PLAN.....	7-13
7.7 GROUNDWATER MANAGEMENT.....	7-15
7.7.1 INTRODUCTION	7-15
7.7.2 RELEVANT FACILITIES / ACTIVITIES	7-16
7.7.3 GROUNDWATER MANAGEMENT AND MITIGATION PLAN.....	7-16
7.8 AIR QUALITY MANAGEMENT.....	7-16
7.8.1 INTRODUCTION	7-16
7.8.2 RELEVANT FACILITIES / ACTIVITIES	7-17
7.8.3 AIR QUALITY MANAGEMENT AND MITIGATION PLAN	7-17
7.9 NOISE MANAGEMENT	7-18
7.9.1 INTRODUCTION	7-18
7.9.2 RELEVANT FACILITIES / ACTIVITIES	7-18
7.9.3 NOISE MANAGEMENT AND MITIGATION PLAN	7-18
7.10 ARCHAEOLOGICAL RESOURCES MANAGEMENT.....	7-19
7.10.1 INTRODUCTION	7-19
7.10.2 RELEVANT FACILITIES / ACTIVITIES	7-19
7.10.3 ARCHAEOLOGICAL MANAGEMENT AND MITIGATION PLAN	7-19

7.11	VISUAL ASPECT MANAGEMENT	7-20
7.11.1	INTRODUCTION	7-20
7.11.2	RELEVANT FACILITIES / ACTIVITIES	7-20
7.11.3	VISUAL MANAGEMENT AND MITIGATION PLAN	7-20
7.12	WASTE MANAGEMENT	7-21
7.12.1	INTRODUCTION	7-21
7.12.2	SOLID WASTE MANAGEMENT AND MITIGATION PLAN	7-21
7.13	SOCIO-ECONOMIC ASPECT MANAGEMENT	7-24
7.13.1	INTRODUCTION	7-24
7.13.2	RELEVANT FACILITIES / ACTIVITIES	7-24
7.13.3	SOCIO-ECONOMIC MANAGEMENT AND MITIGATION PLAN	7-24
7.14	TRAFFIC MANAGEMENT	7-26
7.14.1	RELEVANT FACILITIES / ACTIVITIES	7-26
7.14.2	TRAFFIC MANAGEMENT AND MITIGATION PLAN	7-27
7.15	CARBON MANAGEMENT	7-28
	RELEVANT FACILITIES / ACTIVITIES	7-28
7.15.1	CARBON MANAGEMENT AND MITIGATION PLAN	7-28
8.	MONITORING PLAN	8-1
8.1	INTRODUCTION	8-1
8.2	AIR QUALITY MONITORING	8-1
8.3	NOISE MONITORING	8-1
8.4	SOIL MANAGEMENT MONITORING	8-2
8.5	WASTE MANAGEMENT AND DISPOSAL MONITORING	8-2
8.6	RE-ESTABLISHED PROTECTED PLANTS	8-2
8.7	AVIFAUNA	8-2
9.	PERSONS RESPONSIBLE FOR IMPLEMENTING THE EMP	9-1
10.	MONITORING AND AUDITING COMPLIANCE TO THE EMP	10-1
10.1	AUDITS AND INSPECTIONS	10-1
10.2	SUBMISSION OF INFORMATION	10-1
11.	REFERENCES	11-1

LIST OF FIGURES

FIGURE 1-1: LOCATION OF THE PV POWER PLANT IN RELATION TO SOME REFERENCE POINTS	1-2
FIGURE 1-2: PROPOSED NEW LAYOUT AND SETTING	1-3

LIST OF TABLES

TABLE 2-1: LIST OF LEGISLATION RELEVANT TO THE TERASUN ENERGY PV POWER PLANT	2-1
TABLE 2-2: NOTIFICATION, REGISTRATION, APPROVAL AND PERMITS	2-2
TABLE 4-1: SUMMARY OF ISSUES IDENTIFIED IN THE 2012 AND 2014 EIAs WITH RELEVANT MANAGEMENT AND MITIGATION PLANS	4-1
TABLE 6-1: SUMMARY OF CONSTRUCTION PHASE INFRASTRUCTURE, SERVICES AND ACTIVITIES	6-3
TABLE 6-2: SUMMARY OF OPERATIONAL PHASE INFRASTRUCTURE, SERVICES AND ACTIVITIES	6-4
TABLE 7-1: ARANDIS STAKEHOLDERS	7-1
TABLE 7-2: STAKEHOLDER MANAGEMENT AND MITIGATION PLAN	7-3
TABLE 7-3: GENERAL (THIRD PARTY) SAFETY AND SECURITY MANAGEMENT PLAN	7-4
TABLE 7-4: SOIL POLLUTION MANAGEMENT AND MITIGATION PLAN	7-6
TABLE 7-5: SOIL AND PHYSICAL DISTURBANCE MANAGEMENT AND MITIGATION PLAN	7-6
TABLE 7-6: TOPSOIL MANAGEMENT AND MITIGATION PLAN	7-7
TABLE 7-7: MANAGEMENT AND MITIGATION PLAN TO PREVENT THE LOSS OF ORGANISMS AND HABITATS AND TO MAINTAIN KEY ECOLOGICAL PROCESSES	7-9
TABLE 7-8: CONTAMINATION OF SURFACE WATER MANAGEMENT AND MITIGATION PLAN	7-13
TABLE 7-9: EFFLUENT MANAGEMENT AND MITIGATION PLAN	7-14
TABLE 7-10: SPILLAGE MANAGEMENT AND MITIGATION PLAN	7-15
TABLE 7-11: GROUNDWATER MANAGEMENT PLAN	7-16
TABLE 7-12: DUST MANAGEMENT AND MITIGATION PLAN	7-17
TABLE 7-13: NOISE MANAGEMENT AND MITIGATION PLAN	7-18
TABLE 7-14: ARCHAEOLOGICAL MANAGEMENT AND MITIGATION PLAN	7-19
TABLE 7-15: VISUAL DISTURBANCE MANAGEMENT AND MITIGATION PLAN	7-20
TABLE 7-16: SOLID WASTE MANAGEMENT AND MITIGATION PLAN	7-21
TABLE 7-17: WASTE STORAGE AND DISPOSAL PROCEDURE	7-22
TABLE 7-18: SOCIO-ECONOMIC IMPACT MANAGEMENT AND MITIGATION PLAN	7-25
TABLE 7-19: TRAFFIC IMPACT MANAGEMENT AND MITIGATION PLAN	7-27
TABLE 7-20: CARBON MANAGEMENT AND MITIGATION PLAN	7-28

ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report:

Acronyms / Abbreviations	Definition
ATC	Arandis Town Council
CTAN	Coastal Tourism Association of Namibia
DRFN	Desert Research Foundation of Namibia
DWA	Directorate of Water Affairs
EAP	Environmental Assessment Practitioner
EAPAN	Environmental Assessment Professionals' Association of Namibia
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPC	Engineering, procurement and construction
HAN	Hospitality Association of Namibia
HFO	Heavy Fuel Oil
HIV / AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
I&APs	Interested and Affected Party
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MET	Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
MoHSS	Ministry of Health and Social Services
MP	Management Program
MSDS	Material Safety Data Sheets
MW	Megawatt
NACOMA	Namibian Coast Conservation and Management Project
NANGOF	Namibia Non-Governmental Organizations' Forum
NEWS	Namibia Environment and Wildlife Society
NIMT	Namibian Institute of Mining and Technology
NNF	Namibian Nature Foundation
O&M	Operations and maintenance
PPA	Power Purchase Agreement
(Pty) Ltd	Proprietary Limited
PV	Photovoltaic
SAIEA	Southern Africa Institute for Environmental Assessment
SEMS	Social and Environmental Management System
SME	Small and medium enterprises
TB	Tuberculosis
WWF	World Wildlife Fund in Namibia

ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE TERASUN ENERGY PV POWER PLANT AT ARANDIS

1. INTRODUCTION

Arandis Power (Pty) Ltd (Arandis Power) has an Environmental Clearance Certificate (ECC) for the development of the Arandis Thermal Power Generation and Waste Oil Recycling Plants within the area allocated for noxious industry to the east of Arandis. Arandis is in the Erongo Region, about 60 km east of Swakopmund, off the main B2 road to Windhoek, over Swakopmund to Walvis Bay. The location of the approved project is shown in Figures 1-1 and 1-2 respectively.

The ECC was issued by the Ministry of Environment and Tourism (MET), now the Ministry of Environment, Forestry and Tourism (MEFT) following the Environmental Impact Assessment (EIA) process that was conducted in 2012. As part of the EIA conducted then, an “Environmental Management Plan (EMP) for the Arandis Thermal Power Generation and Waste Oil Recycling Plants” (SLR, 2012) was developed and submitted to the authorities, and approved by MET.

The proposed power station’s nominal output capacity was assessed and approved at 120 Megawatt (MW) which would be generated by engines utilising a residual fuel known as heavy fuel oil (HFO) and recycled oil from a waste oil recycling plant.

Since the project was conceptualised in 2007, solar (photovoltaic (PV)) power has reduced in price and has become a feasible alternative to the waste oil generated power. Arandis Power therefore proposed to construct and operate a ‘Hybrid’ Thermal / PV Plant with the maximum output capacity remaining 120 MW. The PV Power Plant was planned north of the approved Thermal Power Plant with its 8 HFO engines. The project was planned as a combined PV / Thermal Plant, which can operate flexible.

Another EIA (scoping) process, which included the assessment of the Hybrid Thermal / PV Plant was conducted in 2014. The subsequent EMP for the proposed Hybrid Thermal / PV Plant was based on the findings of the original 2012 EIA (relating to the HFO Power Plant), combined with the 2014 EIA. The EMP documented a series of individual management programs (MPs) which were designed to meet legal requirements and avoid or minimize the impacts associated with the Hybrid Thermal / PV Plant. The management commitments from the 2012 EMP (SLR, 2012) relevant to the HFO Power Plant remained applicable and were included in the MPs. The updated EMP of 2014 were submitted to the authorities and an environmental clearance certificate (ECC) was issued to Arandis Power (Pty) Ltd, which was renewed in 2017. The ECC was again renewed in September 2020 and is still valid.

Arandis Power intends to differentiate the HFO Power Plant from the PV Power Plant. This way, the PV Power Plant becomes an entity independent from the HFO Power Plant and will be operated by TeraSun Energy (Pty) Ltd (TeraSun Energy). As a result of the differentiation, permission is asked to split the approved combined EMP into two and be made specific to each of the two independent entities.

This document is the EMP specifically related to the TeraSun Energy PV Power Plant.

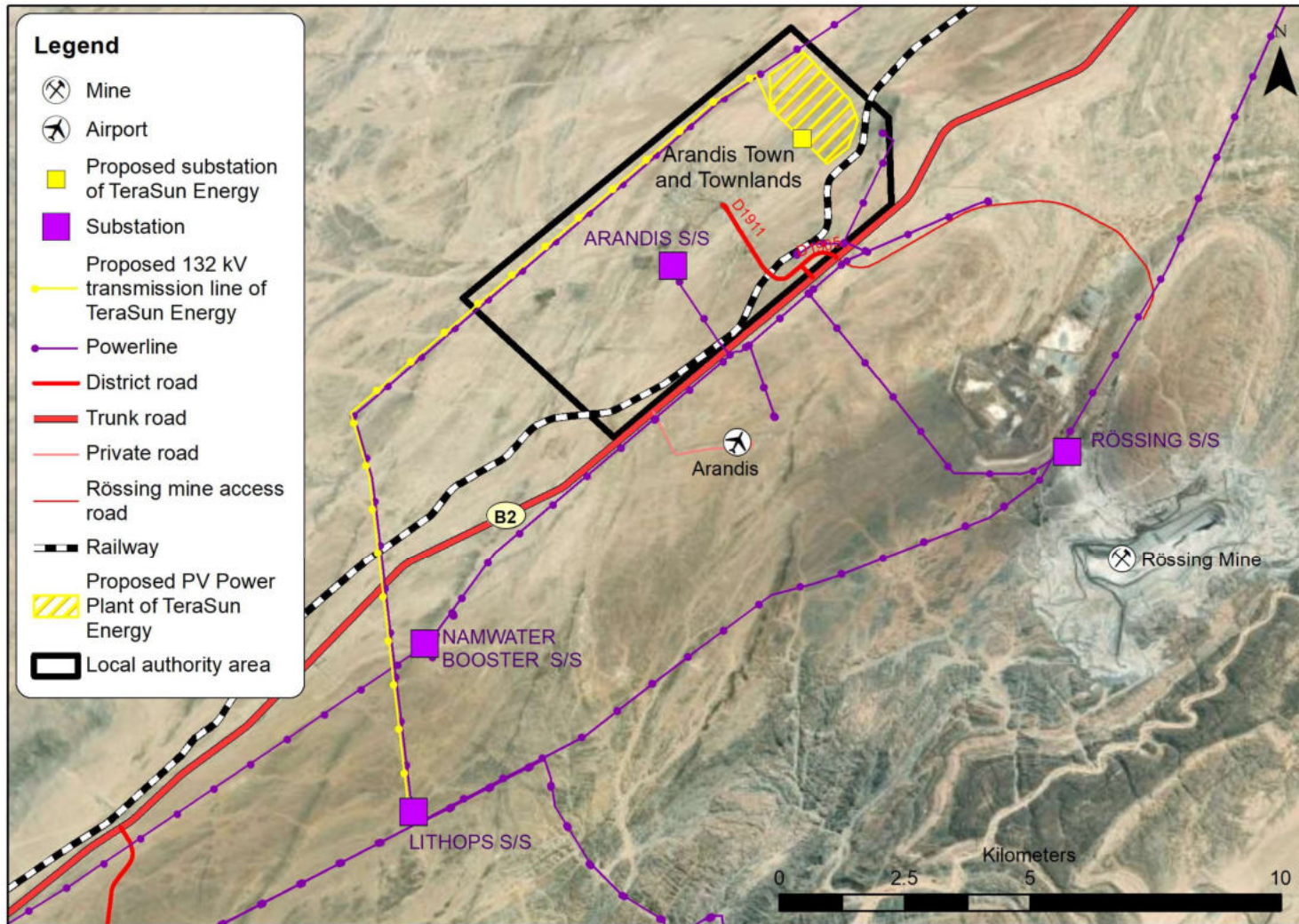


FIGURE 1-1: LOCATION OF THE PV POWER PLANT IN RELATION TO SOME REFERENCE POINTS



FIGURE 1-2: PROPOSED NEW LAYOUT AND SETTING

(Source: TeraSun, 2022)

Explanation: Green = sensitive zones; white = areas earmarked for development; red line = new powerline

2. LEGAL FRAMEWORK

This section outlines Namibian legislation which is relevant to the PV Power Plant. Table 2-1 provides a summary list of the relevant legislation.

TABLE 2-1: LIST OF LEGISLATION RELEVANT TO THE TERASUN ENERGY PV POWER PLANT

YEAR	NAME
Current Namibian legislation	
1990	The Constitution of the Republic of Namibia of 1990
1992	The Labour Act, No. 6 of 1992
1992	The Regional Councils Act, No. 22 of 1992
1997	Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 (GN156, GG 1617 of 1 August 1997)
1998	Affirmative Action (Employment) Act, No. 29 of 1998
1997	Namibian Water Corporation Act, No. 12 of 1997
1998	The Health Act, No. 21 of 1998
1999	Road Traffic and Transport Act, No. 22 of 1999
2007	Electricity Act, No. 4 of 2007
2001	The Forestry Act, No. 12 of 2001
2004	National Heritage Act, No. 27 of 2004
2007	Labour Act, No. 11 of 2007
2007	Environmental Management Act, No. 7 of 2007
2013	Water Resources Management Act, No. 11 of 2013
Former South African legislation still relevant in Namibia	
1919	Public Health Act, No. 36 of 1919
1969	Soil Conservation Act, No. 76 of 1969
1974	Hazardous Substances Ordinance, No. 14 of 1974
1975	Nature Conservation Ordinance, No. 14 of 1975
Namibian policy	
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation
1998	Draft White Paper on the Energy Policy of Namibia
2000	National Water Policy White Paper
2010	National Policy on Climate Change
International law to which Namibia is a signatory	
1985	Vienna Convention for the protection of the ozone layer
1987	Montreal Protocol on substances that deplete the ozone layer
1989	The Basel Convention on the control of trans-boundary movements of hazardous wastes and their

YEAR	NAME
	disposal
1989	The Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade
1992	The Rio de Janeiro Convention on biological diversity
1992	United Nations Framework Convention on climate change

2.1 PERMITS

Before the operations can commence, TeraSun Energy will need to acquire a number of permits and certificates as outlined in Table 2-2 below.

TABLE 2-2: NOTIFICATION, REGISTRATION, APPROVAL AND PERMITS

ISSUE	LEGISLATION	REQUIREMENT / PERMIT
Occupational health and safety issues, mostly compliance, some requiring permits or notification	Labour Act, 2007	This law, under the Regulations relating to the Health and Safety of Employees at Work, 1997, stipulates various occupational health and safety requirements, some of which are compliance rather than related to prior approval, and some of which overlap or are related to environmental clearances.
Disturbance of archaeological objects, paleontological sites or meteorites	National Heritage Act, 2004	Requirement to obtain consent in terms of Section 55 before altering or developing any land in which an archaeological object or palaeontological site or a meteorite is believed to be located.
Protection of protected plants	Nature Conservation Ordinance, 1975	Section 73 of this ordinance prohibits the picking of plants.
Wastewater permit	Water Act, 1956	Permits required in the case of purification of wastewater and discharge of dirty water. See Section 21 and 22

3. DETAILS OF PERSONS WHO PREPARED THIS EMP

SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) was the independent firm of consultants that had been appointed by Arandis Power to undertake the initial environmental impact assessments and related processes, including the existing approved EMP.

This document, an independent EMP applicable to TeraSun Energy only, was compiled by Namisun in 2021. Dr Pierré Smit, the author of this updated document, holds a PhD in Landscape Ecology and has over twenty-seven years of experience in environmental management, managing environmental assessment and the implementation of EMPs and Environmental Management Systems in Namibia. Werner Petrick, the reviewer, has more than twenty-three years of relevant experience in conducting / managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Werner has a B. Eng (Civil) degree and a master's degree in environmental management and is certified as lead environmental assessment practitioner (EAP) and reviewer under the Environmental Assessment Professionals Association of Namibia (EAPAN).

4. SCOPE OF THE EMP

This EMP contains a series of management and mitigation plans designed to meet legal requirements and to minimize the negative impacts associated with TeraSun Energy's PV Power Plant at Arandis during the construction, operational, decommissioning and closure phases.

The commitments contained in this EMP form the overarching contractual agreement with the Namibian authorities for sound environmental management. All employees, contractors and sub-contractors and any visitors to site will be expected to comply with the commitments contained herein.

The EMP provides an outline of the overall management objectives for the various environmental and social aspects which have been identified in the environmental impact assessment processes, followed by the detailed management and mitigation plans as well as monitoring and auditing requirements.

Table 4-1 provides a list of the main environmental and social issues identified during the 2012 and 2014 EIA processes, and reference them to the relevant management and mitigation measures. Management and mitigation plans have been developed to address the specific issues and the detailed management plans are described in Section 7.

TABLE 4-1: SUMMARY OF ISSUES IDENTIFIED IN THE 2012 AND 2014 EIAs WITH RELEVANT MANAGEMENT AND MITIGATION PLANS

ENVIRONMENTAL COMPONENT	ISSUE	RELEVANT MANAGEMENT AND MITIGATION PLAN
STAKEHOLDERS	Stakeholder consultation	Stakeholder Management and Mitigation Plan (Section 7.1)
TOPOGRAPHY	Hazardous excavations and infrastructure	Safety and Security Management and Mitigation Plan (Section 7.2)
SOIL AND LAND CAPABILITY	Loss of soil resources from pollution	Soil Management and Mitigation Plan (Section 7.3)
	Loss of soil resources from physical disturbance	
BIODIVERSITY – NATURAL VEGETATION AND ANIMAL LIFE	Physical destruction of biodiversity	Biodiversity Management and Mitigation Plan (Section 7.5)
	General disturbance of biodiversity	
	Interruption of drainage and inference with water flow	
SURFACE WATER	Altering drainage patterns	Surface Water and Stormwater Management and Mitigation Plan (Section 7.6)
	Pollution of surface water	
GROUNDWATER	Contamination of groundwater	Groundwater Management and Mitigation Plan (Section 7.7)

ENVIRONMENTAL COMPONENT	ISSUE	RELEVANT MANAGEMENT AND MITIGATION PLAN
AIR QUALITY (INCLUDING GREENHOUSE GAS EMISSIONS)	Air pollution	Air Quality Management and Mitigation Plan (Section 7.8)
NOISE	Noise pollution	Noise Management and Mitigation Plan (Section 7.9)
ARCHAEOLOGY	Damage to archaeological resources and landscapes	Archaeology Resources Management and Mitigation Plan (Section 7.10)
VISUAL	Visual impact	Visual Management and Mitigation Plan (section 7.9)
SOCIO-ECONOMIC	Contribution to national, regional and local economy	Socio-economic Management and Mitigation Plan (section 7.13)
	Employment creation and skills training	
	In-migration and community health	
	Impact on government services	
TRAFFIC	Impact on road infrastructure capacity	Traffic Management and Mitigation Plan (section 7.14)
	Impact on road safety	

4.1 INDUCTION AND ENVIRONMENTAL AWARENESS TRAINING

All persons who work or visit this site will be required to undergo induction. Different induction programs will be developed for managers, employees, contractors, and visitors. The environmental management and mitigation plans in Section 7 highlight the areas where training is required.

4.2 SOCIAL AND ENVIRONMENTAL MANAGEMENT SYSTEM

TeraSun Energy will need to develop and implement a Social and Environmental Management System (SEMS). The specific requirements of this EMP will be incorporated into a SEMS to be developed prior to construction. in line with the Equator Principles.

5. ENVIRONMENTAL OBJECTIVES

The following overall social and environmental objectives, as outlined in the 2012 EIA for the Arandis Power operations, remain applicable. These have been set and are guided by the specific Sustainability and Environmental Policies, included in Appendix A and Appendix B respectively:

- To ensure compliance with relevant national legislation and standards, Equator Principles, corporate sustainability and environmental policies and objectives as well as the EMP.
- To limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat within the operational area.
- To investigate and exploit measures to reduce resource and energy consumption.
- To limit contaminated effluent discharge through containment, recycling, or removal of contaminated water.
- To conserve soil resources by stripping, stockpiling, and managing topsoil.
- To protect soils and surface and groundwater resources through the implementation of measures for spill prevention and clean-up.
- To ensure the appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, management, temporary storage, and removal of waste.
- To reduce the potential for dust emissions through the implementation of dust control measures.
- To protect archaeological resources by avoiding sites of significance, or, if this cannot be done, to ensure thorough documentation and authorisation thereof prior to destruction.
- To undertake rehabilitation wherever possible during the life of the operations.
- To incorporate final closure objectives in construction and project planning.
- To develop, implement and manage environmental monitoring systems for ground and surface water, soils, air quality, biodiversity, and noise.
- To support and encourage environmental awareness and responsibility amongst all employees and service providers.
- To provide appropriate environmental education and training for all employees and service providers.
- To keep surrounding communities informed of project activities through the implementation of forums for communication and constructive dialogue.
- To ensure the safety of surrounding communities through access and traffic control.

6. PROJECT OVERVIEW

6.1 CONSTRUCTION PHASE

The purpose of the construction phase is primarily to establish the infrastructure and activities required for the operational phase. Several work areas will be established onsite during the construction phase. These work areas will be within the footprint of the planned operational infrastructure, as indicated in Figure 1-2. A summary of the construction phase infrastructure, services and activities is provided in Table 6-1.

Construction of the plant will take approximately 21 months to complete.

6.2 OPERATIONAL PHASE

The PV Power Plant will have a maximum output capacity of 100 Megawatt (MW). The location and layout of the plant is indicated in Figure 1-2.

6.3 DECOMMISSIONING AND CLOSURE

It should be noted that although the Power Purchase Agreement (PPA) with NamPower would be for a period of 20 years, the life of the operations could be expanded well into the future. It is therefore at this stage, uncertain when the operations will be decommissioned for rehabilitation and closure.

At a conceptual level, decommissioning will be considered as the reverse of the construction phase activities with the demolition and removal of most of the infrastructure and activities very similar to those described with respect to the construction phase. It is anticipated that all the structures associated with the plant and its operations will be demolished during the decommissioning phase and that no infrastructure will remain onsite.

The final closure objectives will need to be discussed and agreed with the Arandis Town Council (ATC) as the area has been zoned for heavy industry.

The following broader objectives will be applied:

- Disturbed areas will be returned to as close to their original state as practicable.
- Contamination beyond the site by wind or surface runoff will be prevented through appropriate containment bunds and air pollution prevention measures.
- Relevant linear infrastructure within the footprint of the proposed site comprising roads, railways, pipelines, power lines and related components will be removed, and the disturbed land rehabilitated to blend with the surrounding natural environment, unless an alternative end-use is identified.
- Socio-economic impacts (including the loss of employment) will be minimized through careful planning and preparation for closure beginning three to five years before closure takes place.

The above principles and concepts will be refined as part of ongoing detailed closure planning and costing during the life of the operations and in consultation with ATC.

It is envisaged that no surface infrastructure within the proposed plant site will remain once demolition and decommissioning activities have ceased. It is therefore not anticipated that any closure activities, apart from environmental monitoring, will be required once the rehabilitation has been completed. Environmental monitoring should continue for a couple of years after rehabilitation to ensure closure objectives have been achieved.

SLR Environmental Consulting (Namibia) (Pty) Ltd

TABLE 6-1: SUMMARY OF CONSTRUCTION PHASE INFRASTRUCTURE, SERVICES AND ACTIVITIES

CONSTRUCTION INFRASTRUCTURE AND SERVICES	CONSTRUCTION ACTIVITIES
<p>The following facilities will be required for the construction phase.</p> <ul style="list-style-type: none"> • Contractors lay-down areas • Workshop and maintenance areas • Storage area for storing and handling fuel, lubricants, solvents, paints, and construction materials • Mobile site offices • Waste collection and storage areas • Mobile change houses / ablution / sanitation facilities • Access road and access control • Parking area for cars and equipment • Temporary power and water supply infrastructure. <p>Water: Potable water will be required for human consumption, civil construction, and dust management during the construction phase of the project. Water will be transported to the site via the existing municipal network system.</p> <p>Power: Temporary power for the construction phase will be supplied by generators.</p> <p>Sanitation: Temporary sanitation will be provided onsite. Initially, portable toilets with associated septic tanks will be used. The septic tanks will be emptied on a regular basis by an appointed contractor for disposal at the Arandis municipal sewage treatment works.</p> <p>Site access: The main access from the D1911 road to the site will be constructed in consultation with and with approval from relevant regulatory authorities. It will be designed and constructed in strict accordance with the relevant technical standards.</p>	<p>Earthworks: Excavation and trenching Disposal or treatment of contaminated soil Construction of temporary access and internal roads Civil works and building activities Storage and handling of material: Sand, rock, cement, chemicals, fuel, additives in cements Water and electricity utilisation Mixing and pouring of concrete, and concrete works Operation and movement of construction vehicles and equipment Refuelling of equipment Handling, storage, and disposal of hazardous waste (hydrocarbon waste, empty paint containers, cement bags, chemical additives containers, contaminated PPE and other wastes, broken panels, redundant concrete) Handling, storage, and disposal of non-hazardous waste (domestic waste, steel, wood, other construction waste, rubble, packaging material) Transportation of hazardous material and non-hazardous material. Transportation of materials and equipment Handling and storage of hazardous material (fuel, lubricants, paints, gas for welding, cement, chemical additives) Laying of cables, water pipelines and sewerage lines</p> <p>Waste management: General waste and hazardous waste will be trucked offsite and disposed of at the licensed waste sites at Arandis, Swakopmund and Walvis Bay. Waste management plan to be implemented (Section 7.12).</p>

SLR Environmental Consulting (Namibia) (Pty) Ltd

TABLE 6-2: SUMMARY OF OPERATIONAL PHASE INFRASTRUCTURE, SERVICES AND ACTIVITIES

OPERATIONAL INFRASTRUCTURE AND SERVICES	OPERATIONAL ACTIVITIES/FACILITIES
<p>The operational phase will consist of the following onsite facilities:</p> <ul style="list-style-type: none"> • Solar panels, inverters and transformers • AC-, DC-, communication cabling • A small substation • A tracking system • Fencing • Sewage connections • Infrastructure: Pipelines, access road, municipal power supply, communication, and lighting • Storage areas (may include a laydown area) • A guardhouse, security and access control • Offices <p>Water: The PV Power Plant's panels will be cleaned with water twice per year, and on demand. A maximum of ~1,100 m³ of water per year is required for this purpose. Water will be supplied to the site via a municipal feedline.</p> <p>Power: The site will be connected to the national grid via the proposed new powerline.</p> <p>Sanitation: Sewerage will be managed, either by means of French drains, septic tanks or managed chemical systems.</p> <p>Housing: No housing will be provided for workers onsite.</p>	<p>The PV Power Plant is planned on an approved lease of 120 ha. The PV Power Plant is planned with a capacity of 100 MWp. The PV modules are planned on single-axis trackers, arranged in rows in a N-S direction with a E-W tracker system.</p> <p>The following dimensions are proposed:</p> <ul style="list-style-type: none"> • Panel size of approximately 2 m x 1 m • Maximum height above ground is 1.5 – 2.5 m from centre axis of single axis tracker; minimum ground clearance to be 0.4 m • The row widths are 10 – 12 m in the case of two-panels and 6 – 8 m for one-panel structures. <p>The total number of panels for the plant will be approximately 160,000. See Figure 1-2 for the layout of the PV Power Plant.</p> <p>Waste management: General waste and hazardous non-mineralised waste will be sorted and managed by a contractor and trucked offsite to be disposed of at the licensed waste sites at Arandis, Swakopmund and Walvis Bay respectively.</p> <p>A Waste Management Plan will be implemented (Section 7.12).</p> <p>Water management: The PV Power Plant infrastructure will be positioned/designed in such a way that interruption of the natural drainage and inference with water flow is limited (see Section 7.4 of the EMP).</p>

7. MANAGEMENT AND MITIGATION PLANS

This section of the EMP comprises the following management and mitigation plans:

- Stakeholders
- Safety and security
- Soil
- Biodiversity
- Surface and stormwater
- Groundwater
- Air quality
- Noise
- Archaeological resources
- Visual aspects
- Waste management
- Socio-economic aspects
- Traffic
- Carbon.

The various management and mitigation plans provided below indicate the project phase during which the relevant management and mitigation measures will be implemented.

7.1 STAKEHOLDER MANAGEMENT AND MITIGATION PLAN

7.1.1 INTRODUCTION

At the beginning of the 2012 EIA process, SLR identified several stakeholders who needed to be informed about the project. The list of Interested and Affected Parties (I&APs) has grown throughout the EIA public consultation process and was again updated as part of the 2014 EIA process. Table 7-1 provides a broad list of stakeholders that are relevant to the proposed project. They were informed about the project through the EIA public consultation process.

TABLE 7-1: ARANDIS STAKEHOLDERS

STAKEHOLDER GROUPING	ORGANISATION
Shareholders	Shareholders of Arandis Power
Local and regional government – councillors and key officers	ATC, Erongo Regional Council, Walvis Bay and Swakopmund Town Councils
Authorities notably:	Ministry of Mines and Energy (MME); MET now MEFT; National Planning Commission; Ministry of Agriculture, Water and Land Reform (MAWLR), particularly the Directorate of Water Affairs (DWA); Ministry of Works and Transport; Ministry of Industrialisation and Trade; Ministry of Labour, Industrial Relations and Employment Creation; Ministry of Education, Arts and Culture; Ministry of Health

STAKEHOLDER GROUPING	ORGANISATION
	and Social Services (MoHSS); Ministry of Urban and Rural Development
Parastatals	NamWater; NamPower; TransNamib; Roads Authority (RA); Erongo Red; Telecom Namibia; National Heritage Council;
Neighbouring mines or exploration companies	Rössing Uranium Limited; Orano Mining; North River Resources (Namib Lead), Swakop Uranium (Husab); Bannerman (Etango) and Langer Heinrich Uranium
Non-governmental organizations (NGOs)	Namibian Coast Conservation and Management Project (NACOMA); Southern Africa Institute for Environmental Assessment (SAIEA); Earthlife Namibia; Desert Research Foundation of Namibia (DRFN); Wildlife Society of Namibia; Namibian Nature Foundation (NNF); World Wildlife Fund in Namibia (WWF); Namibia Environment and Wildlife Society (NEWS); Rössing Foundation; Namibia Non-Governmental Organizations' Forum (NANGOF); Walvis Bay Corridor Group; Coastal Tourism Association of Namibia (CTAN); Hospitality Association of Namibia (HAN)
National chambers	Chamber of Mines of Namibia; Namibia Chamber of Environment, National Chamber of Commerce and Industry
Local businesses	Especially in Arandis, Swakopmund and Walvis Bay
Educational institutions	Namibian Institute of Mining and Technology (NIMT); Arandis Primary School, UB Dax Senior Primary School and Kolin Foundation Secondary School.
Government services (Arandis)	Namibian Police, Clinic, Magistrate's Office, NATIS, NamPol Traffic division
Residents	Residents of informal settlements; homeowners/tenants in Arandis
Media	The Namibian; Allgemeine Zeitung; Die Republikein; Namib Times; Channel 7; Namibian Broadcasting Corporation Radio; Radio Wave 96.7FM; Namibia Economist; Informante; Insight; New Era
Other interested and affected parties (I&APs)	Other people with an interest in or who may be affected by the proposed project who attended meetings during the scoping phase, or who attended open days during the EIA phase, or have responded to advertisements during the main EIA phase.

7.1.2 MANAGEMENT AND MITIGATION COMMITMENTS RELATING TO STAKEHOLDERS

Objectives:

- Ensure that ongoing feedback is provided on the relevant project activities, together with feedback on the environmental management performance of the PV Power Plant and that opportunity is provided for interested and affected parties to raise comments and ensure concerns (complaints) on the same.
- Ensure communication/engagement strategies meet the needs of stakeholders.

TABLE 7-2: STAKEHOLDER MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	COMMITMENT
These commitments apply to <u>all phases</u>		
1	Arandis stakeholder identification	Maintain and update the stakeholder register, including stakeholders' needs and expectations. Ensure that all relevant stakeholder groups are included.
2	Liaising with interested and affected parties	Devise and implement a stakeholder communication and engagement strategy.
3		As far as is reasonable, inform identified stakeholders about the PV Power Plant's activities.
4		Use appropriate communication channels to consult with and disseminate information to the public.
5		Communication channels could include public meetings or open days, newsletters for both employees and the public, national and local newspapers, television, radio and the internet, an annual sustainable development report.
6	Managing issues and complaints	Develop and implement a concerns / complaints (grievance) process for the public and publicise the channels through which complaints and comments can be submitted to the company. Respond within reasonable time frames to all complaints and comments on receipt thereof and keep complete records of both complaints and responses. The process for receiving and responding to concern/complaints will be formally documented in a grievance procedure.
7	Safety of third parties	Through appropriate communication and inductions, provide information to educate third parties about the dangers associated with the PV Power Plant and related activities.
8	Reporting	Report regularly as required to the relevant authorities in terms of authorisations issued by the relevant departments or ministries.
9		In the event of an emergency an incident report will be submitted to DWA and MEFT.

7.2 SAFETY AND SECURITY MANAGEMENT

7.2.1 INTRODUCTION

It is essential that safety and security measures are defined and implemented to ensure that the PV Power Plant cannot be accessed by unauthorised people. Hazardous excavations and infrastructure will be present from construction through operation to decommissioning. The closure phase will not present any permanent hazardous excavations or infrastructure as all infrastructure will be removed from the site. There is however also the potential for an increase in road accidents because of the increase in traffic to and from the site. Traffic safety management measures are addressed in detail in Table 7.41.

7.2.2 RELEVANT FACILITIES / ACTIVITIES

Construction	Operational	Decommissioning	Closure
Excavations and trenches Scaffolding	Structures and equipment Scaffolding for	Excavations and trenches Scaffolding	N/A

Construction	Operational	Decommissioning	Closure
Vehicles and equipment (including cranes)	maintenance purposes	Vehicles and equipment (including cranes) Rubble and scrap stockpiles	

7.2.3 SAFETY AND SECURITY MANAGEMENT PLAN

This plan is made up of the following components:

- General (third party) safety and security.

7.2.3.1 General (third party) Safety and Security

Objective: prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure.

TABLE 7-3: GENERAL (THIRD PARTY) SAFETY AND SECURITY MANAGEMENT PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Prevent access of unauthorised people to the PV Power Plant	Provide appropriate fencing, security access control and warning signs (in appropriate languages with danger pictures) at the PV Power Plant access point, around the entire site at appropriate intervals, based on risk. Train staff to ensure that third parties and animals do not unwittingly enter a safety risk area. Small vertebrates should however be able to cross the PV Power Plant area undisturbed up to the size of a 20 cm.
2	Educate third parties	Third parties will be provided with information concerning the dangers associated with hazardous excavations and infrastructure at stakeholder information meetings.
3	Prevent drowning	Water holding facilities will be covered and fenced-off to prevent drowning
3	Emergency	Develop and implement an emergency response plan for accidental injury to third parties or animals.

Impacts on the health and safety of workers and contractors were not assessed by the EIA. TeraSun Energy will adhere to all the relevant Namibian legislation regarding health and safety and implement a formal health and safety management system.

7.3 SOIL MANAGEMENT

7.3.1 INTRODUCTION

The physical loss of soils and or the loss of soil functionality are important issues because soil is an important natural resource and provides important ecosystem services, such as water filtering, provision of growth medium for plants, provision of shelter and habitat for specialist vertebrate and invertebrates. Soil is also a key component with respect to rehabilitation at the end of the project life. Soil can be impacted upon in the following manner by the proposed project:

- Loss of soil resources through pollution.
- Loss of soil resources through physical disturbance.

7.3.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Soil pollution			
General construction activities Storage and handling of hazardous substances Waste management Equipment maintenance Concrete mixing Utilisation of vehicles which may leak lubricants and fuel	Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Wastewater	Site demolition General decommissioning activities Storage and handling of hazardous substances Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Wastewater	N/A
Soil disturbance			
Site preparation, including clearing and grubbing General construction activities Trenching and excavations; preparation of foundations Compaction, also for roads Vehicle movement	Vehicle movement Waste management Vehicle movement	Demolition Earthworks Vehicle movement Waste management Rehabilitation	Erosion of final rehabilitated land

7.4 SOIL MANAGEMENT AND MITIGATION PLAN

This plan is made up of the following components:

- Loss of soil resources through pollution.
- Loss of soil resources through physical disturbance.

7.4.1.1 Soil Pollution Management

Objective: Prevent soil pollution and mitigate accidental spills.

TABLE 7-4: SOIL POLLUTION MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Soil pollution	<p>Ensure that all potentially polluting substances and materials such as hazardous chemicals (new and used) and wastewater are handled in a manner that they do not pollute soils. This will be implemented through one or more procedure(s), work instruction(s) and or method statement(s) covering the following:</p> <ul style="list-style-type: none"> • Pollution prevention through basic infrastructure design and through education and training of workers (permanent and temporary). • Correct off-loading, storage and handling procedures • The required steps to enable fast reaction to contain and remediate pollution incidents. Options include in situ treatment or disposal of contaminated soils as hazardous waste. The preferred option is in situ remediation of soils. • Specifications for post-rehabilitation audit criteria will be developed as part of detailed closure planning to ascertain whether the remediation has been successful. <p>Proper hazardous and non-hazardous waste storage and disposal – refer to Table 7-16.</p>
2	Emergency	Major spillage incidents will be handled in accordance with an emergency response procedure.

7.4.1.2 Physical Disturbance Management

Objective: Prevent the loss of soils and related functionality through physical disturbance, erosion and compaction.

TABLE 7-5: SOIL AND PHYSICAL DISTURBANCE MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Soil resource management	<p>A soil management plan will be implemented. The key components are:</p> <ul style="list-style-type: none"> • Limit the disturbance of soils to what is absolutely necessary both in terms of site clearing, grubbing, trenching and excavation, as well as in terms of general construction activities and the use of vehicles. Apply the principle of selective clearing and grubbing to minimize the magnitude of earthworks and the levelling prior to construction. Where possible, apply uprights with differentiating heights to compensate for topographic variation, instead of levelling the ground to get equal heights of the structures. • Where soils are disturbed, topsoil must be collected, stored, maintained and replaced in accordance with the specifications of a Topsoil Management Plan (Table 7-6).
2		As part of decommissioning and closure planning, the rehabilitation of land will take into consideration the requirements for long-term erosion prevention.

7.4.1.3 Topsoil Stockpiling and Management

Objective: Ensure that all topsoil stripping, stockpiling and replacement operations will be undertaken in a manner that limits impacts on the soils' ecological functionality and ensure that the soils can be used for restoration as and when required.

TABLE 7-6: TOPSOIL MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction and operation phases</u>		
1	Delineation of stockpiling areas	Limit the disturbance of soils to what is absolutely necessary (i.e., the planned layout for the PV Power Plant).
2	Stockpile management	Stockpiling areas will be identified as far as practically possible in proximity to the source of the soil.
3		Soil stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.
4		Implement erosion control measures. Options for preventing erosion of stockpiles could include rock cladding or establishment of vegetation such as the Vetivier grass.
5		Soil stockpiles heights will be restricted to a maximum of 2 m. The stockpiles' sides should as far as practically possible be stabilised as a slope of 1 in 6 or less.
6		No waste material will be placed on the soil stockpiles.
7		Equipment movement on top of the soil stockpiles will be limited as far as possible.
8		Monitoring
9	Handling of soils	Handle soils in dry weather conditions as far as possible to cause as little compaction as possible.
10		Accumulation of soil will depend on the magnitude of the selective clearing and grubbing activities and as far as possible restricted to a stripping depth of 300 – 500 mm
11		Topsoil will be stockpiled together with any vegetation cover present.
These commitments apply to <u>decommissioning</u>		
12	Restoration of disturbed land and restoration of vegetation	Stockpiled soil will be used for restoration purposes. The accumulated soil (will be redistributed to achieve an approximate uniform and stable thickness that is free draining.
13		A representative sampling of the stockpiled soils will be analysed to determine its nutrient status. As a minimum the following elements will be tested for: EC, CEC, pH, Ca, Mg, K, Na, P, Zn, Clay % and Organic Carbon – to provide a basis for determining the fertility of soil. Based on the analysis, fertilisers will be added, if necessary.
14		Erosion control measures will be implemented to ensure that the soil is not washed away and that erosion gullies do not develop prior to vegetation establishment.

7.5 BIODIVERSITY (FAUNA AND FLORA) MANAGEMENT

7.5.1 INTRODUCTION

Biodiversity can be impacted upon in the following manner by the project:

- Physical destruction and killing of organisms.
- Disturbance, loss and fragmentation of habitats.
- Interruption of key ecological processes.

7.5.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Physical destruction and killing of organisms			
Site preparation and general construction activities Clearing and grubbing Excavations, trenching Compaction Access road construction Vehicles and equipment Waste management Lighting Leaks and spills	General operational activities Maintenance Vehicles and equipment Waste management Wastewater Water use Lighting Leaks and spills	General demolition and earthworks Rehabilitation activities Waste management Vehicles and equipment Lighting Leaks and spills	Erosion of disturbed land
Disturbance, loss and fragmentation of habitats			
Site preparation and general construction activities Clearing and grubbing Excavations, trenching Soil stripping Compaction Access road construction Vehicles and equipment Fencing Establishing structures	Maintenance Vehicles and equipment Lighting Leaks and spills	General demolition and earthworks Rehabilitation activities Leaks and spills Vehicles and equipment Lighting	Erosion of disturbed land
Interruption of key ecological processes			
Site preparation and general construction activities Clearing and grubbing Excavations, trenching Establishing structures inside the drainage lines Compaction Access road construction Leaks and spills	Operational activities inside the drainage lines Waste management Wastewater Water use Lighting	General demolition and earthworks Rehabilitation activities Leaks and spills	Erosion of disturbed land

7.5.3 BIODIVERSITY MANAGEMENT AND MITIGATION PLAN

The detailed management plan is provided below and indicates how impacts will be avoided, minimized and mitigated. This plan is made up of the following components:

- Managing the physical destruction of organisms.
- Managing general disturbance and destruction of habitats.
- Design requirements to maintain key ecological processes

7.5.3.1 Managing Loss of Organisms and Habitats and Maintain Key Ecological Processes

Objective: Prevent, as far as is possible, the unacceptable loss of species and habitats and maintain key ecological processes.

TABLE 7-7: MANAGEMENT AND MITIGATION PLAN TO PREVENT THE LOSS OF ORGANISMS AND HABITATS AND TO MAINTAIN KEY ECOLOGICAL PROCESSES

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>Design/Planning & Construction</u>		
1	Loss of organisms and habitats; disturbance, and interruption of key ecological processes	Design the footprint of the layout in consideration of the biodiversity sensitivity of the site, and concentrations of protected plants (see Figure 1-2, which illustrates the avoiding of development in the biodiversity sensitive parts of the lease).
2		Avoid, where possible, the placement of panels in the large drainage line (see Table 7-9).
3		Place all structures in such a way to allow free flow of water down drainage lines.
4		Avoid, where possible, the physical destruction of protected plants through design / layout (see No. 1) and by rescuing and relocating them to an area that will not be disturbed.
These commitments apply to <u>construction</u>		
5	Loss of organisms; disturbance, loss and fragmentation of habitats	Limit the areas of disturbance to only what is absolutely necessary. Apply the principle of selective clearing and grubbing to minimize the magnitude of earthworks and the levelling prior to construction. Where possible, apply uprights with differentiating heights to compensate for topographic variation, instead of levelling the ground to get equal heights of the structures.
6		Demarcate and fence construction, operational and decommissioning footprint areas. All personnel including contractors should always remain within these boundaries. Clearly define no-go and demarcated areas. These areas will be indicated on a site plan. The fence around the PV Power Plant area should not block the movement of small vertebrate and not obstruct the free flow of water.
7		Keep tracks between the panel arrays as small as possible.
8		Implement an alien / invasive / weed management program to control the spread of these organisms onto and from disturbed areas
9		Deliberate trapping, collecting, harming, poaching or killing of local fauna is prohibited. Also, the harvesting or collection of plant material is prohibited.

No	ISSUE	MANAGEMENT COMMITMENT
		<p>The use of fire for cooking, hunting and heating is prohibited.</p> <p>Vehicles must use established access roads. No off-road driving will be allowed</p> <p>All drivers to adhere to the site speed limits.</p> <p>Commence rescuing and relocation of plants as soon as possible.</p>
10		<p>Rigorously police the construction crews' adherence to the rules and do not hesitate to invoke penalty clause/s.</p>
11	<p>Protection of <i>Commiphora</i>, <i>Lithops</i>, <i>Aloe</i> and other conservation worthy species</p>	<p>All <i>Commiphora</i> and <i>Aloe</i> on the development site should be considered for rescue and relocation, with the necessary permits and supervision in place.</p> <p>The amended layout carved out the extensive ancient rings comprising >100 <i>A. asperifolia</i>. These clumps must be avoided and protected, where possible, so that the construction crews and staff do not disturb these patches of plants.</p> <ul style="list-style-type: none"> • The amended layout carved out the occurrence of <i>Lithops</i> and these areas must be avoided during construction to prevent their disturbance. • If applicable, a permit will be obtained in a timeously manner for the removal or destruction of protected plant species such as <i>Lithops ruschiorum</i>, <i>Commiphora saxicola</i> and <i>Aloe asperifolia</i>.
12		<p>Plant rescue and relocation should not be undertaken lightly and should avoid disturbance of areas that would otherwise remain pristine or undisturbed. Preferably a botanist must supervise the rescuing and relocation of the plants. Advantages must be weighed up to determine whether such high-profile fixes should be undertaken. If they are then they should be carefully designed and include long-term monitoring, from which the results should be published to inform future activities of this nature.</p>
13		<p>As a matter of principle, apply the following priority rule for each PV panel:</p> <ul style="list-style-type: none"> • Avoid all <i>Aloes</i>, <i>Commiphora</i> and <i>Lithops</i> spp. • Avoid all other perennial vegetation (especially woody plants). • Rescue and relocate affected plants if avoidance is not possible.
14		<p>Assess usefulness of plant rescue and relocation operations by consulting the relevant experts (restoration ecologist/botanist) and implement such a program if deemed necessary and of low risk.</p> <p>If plant rescue and relocation is required, the following will be considered:</p> <ul style="list-style-type: none"> • Plant rescue and relocation should avoid disturbance of areas that would otherwise remain pristine or undisturbed. • Advantages must be weighed up to determine whether such high-profile fixes should be undertaken. If they are, then they should be carefully designed and include long-term monitoring, from which the results should be published to inform future activities of this nature. In all cases there should be a clear-cut long-term goal. • Relocation should be to nearby similar, safe, undisturbed natural habitats, bearing in mind the high potential of illegal trade in these plants. • Rescued plants should be offered for relocation into botanical gardens. • In some cases relocated plants must be watered – weekly first, then at increasing intervals, for at least two months but preferably for a longer, suitable period.

No	ISSUE	MANAGEMENT COMMITMENT
		<ul style="list-style-type: none"> As this intervention will be done manually, staff needs to be adequately trained and supervised, preferably by an appointed botanist.
These commitments apply to <u>construction, operation and decommissioning</u>		
15	Impacts on fauna and flora in general	<p>Implement an alien/invasive/weed management program.</p> <p>Redirect diverted surface water flow back to natural flow paths.</p> <p>Cover all water bodies to prevent access by larger fauna / birds and equip the water bodies with measures to enable fauna to get out when they fall in.</p> <p>Deliberate trapping, collecting, harming, poaching, or killing of local fauna, as well as plant harvesting is prohibited.</p> <p>No off-road driving is allowed, and all personnel must adhere to the site speed limits.</p>
16	Impact on avifauna	Monitoring of any potentially negative impacts is considered essential; recommendations for monitoring are provided in Section 8.9. Should the results show that such impacts, including injuries and or mortalities of birds are taking place, mitigation measures would need to be investigated, if necessary, on a species-specific basis.
17	Educate workers	Educate all workers on the sensitivity of the site and its surroundings and on species of conservation importance.
18	Monitoring	Monitor success of plant relocation projects.
19		Regularly inspect areas immediately adjacent to operations for signs of illegal plant or fauna collection or hunting.
20		The rings of <i>Aloe</i> plants should be monitored, starting with an initial survey prior to the start of development
These commitments apply to <u>construction, operation, decommissioning and closure</u>		
21	Rehabilitation of destroyed or damaged habitat	<p>During the operational phase closure objectives will be established in consultation with ATC and a biodiversity expert.</p> <p>Develop a rehabilitation plan in consultation with relevant experts and stakeholders at an early stage in the life of project.</p> <p>As part of the rehabilitation plan, ensure that all surface infrastructure is removed from site and no residual infrastructure or landforms remain</p> <p>Establish a rehabilitation budget and including funding of concurrent rehabilitation into the operational budget for the operation.</p> <p>Where possible, commence rehabilitation as soon as area becomes available.</p> <p>Undertake follow up audits and monitoring in the short and long-term to determine the success of the rehabilitation and restoration.</p>
22	Lighting	<p>Reduce fixed outdoor lights to the minimum that is compatible with operational effectiveness and safety.</p> <p>Where light is only intermittently needed, use motion detectors, time switches or similar, to only supply light when needed.</p> <p>Use yellow outdoor lights (invertebrates see yellow poorly)</p> <p>Install self-closing doors and non-opening windows in operating buildings.</p>
23	Pollution	Implement surface and groundwater management measures as outlined in Table 7-11, Table 7-8 and Table 7-9.

No	ISSUE	MANAGEMENT COMMITMENT
		Implement spill management measures as outlined in Prevent pollution of surface water resources, runoff, and health-related impacts on third parties. TABLE 7-10. Implement soil management measures as outlined in Table 7-6. Implement an efficient waste management system section Table 7-16. Ensure proper handling, storage and use of input materials as outlined in Table 7-8. Provide adequate sanitation facilities for workers.
24	Monitoring	Inspect the areas outside of the plant site for evidence of pollution arising from construction, operational and decommissioning activities.
25	Emergencies	Injury to or killing of animals and illegal harvesting of plants by employees and contractors will be managed in accordance with an emergency response procedure. Unauthorised access by employees and contractors in “no go” areas may constitute an emergency and will be managed in accordance with the emergency response procedure.

7.6 SURFACE AND STORMWATER MANAGEMENT

7.6.1 INTRODUCTION

Water is a scarce resource in Namibia. The project will introduce a range of infrastructure and activities that have the potential to contaminate surface water resources. No significant impacts have been identified about alteration of surface drainage patterns.

7.6.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING -	CLOSURE
Site preparation and general construction activities Storage and handling of hazardous substances Management of wastewater Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Fallout dust	Management of wastewater Waste management Equipment maintenance Storage and handling of hazardous substances Utilisation of vehicles which may leak lubricants and fuel Fallout dust	Demolition General decommissioning activities Storage and handling of hazardous substances Management of wastewater Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Fallout dust	N/A

7.6.3 SURFACE AND STORMWATER MANAGEMENT AND MITIGATION PLAN

This plan is made up of the following components:

- Pollution of surface water.
- Process, domestic and treated effluent management.
- Spill management.

7.6.3.1 Contamination of Surface Water

Objective: Prevent pollution of surface water resources, runoff, and health-related impacts on third parties.

TABLE 7-8: CONTAMINATION OF SURFACE WATER MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>design, construction, operation and decommissioning phases</u>		
1	Clean and wastewater	Surface water management facilities will be designed, constructed, and operated so that wastewater is kept separate from clean water runoff. Runoff in the drainage lines will be left intact and without interference as far as possible. Wastewater will not be allowed to spill into clean water catchments. All surface water management infrastructure will be maintained.
2	General surface water pollution and spills	All hazardous chemicals (new and used), wastewater and wastes are stored, used and handled in a manner that they do not contaminate surface water runoff.
3		Cement and cement aggregate will be stored and mixed on impermeable covers. Concrete will not be mixed directly on the ground. Emptied cement bags will be stored in weatherproof containers and disposed of regularly and will not be used for any other purpose. All excess cement will be collected from the batching plant daily and disposed of appropriately.
4		No sanitation facilities will be located within 100 m of a watercourse.
5		Vehicles and equipment will be properly maintained, and oil or fuel leaks will be repaired immediately upon detection.
6		Any spills will be cleaned up immediately. Spill kits or adsorbent materials will be kept on hand to clean-up spills. Once used, this material will be treated as hazardous waste and disposed of accordingly.
7		Implement proper hazardous and non-hazardous waste storage and disposal procedures as outlined in Table 7-16
8	Handling and storage of input material	Input materials will be properly stored and handled. Material Safety Data Sheets (MSDS) will be kept and adhered to where relevant. The table below lists the anticipated input materials and summarises how these will be handled and stored. Detailed procedures for off-loading, storing and handling of these materials will be developed and implemented.

No	ISSUE	MANAGEMENT COMMITMENT	
		Input material	Handling and storage
		Building materials, tools, machinery	Stored in designated storage areas.
9	Emergency	Major spillages incidents will be handled in accordance with the emergency response procedure.	
10	Training and awareness	Induct all relevant employees and contractors in spillage management procedure.	

7.6.3.2 Process, Domestic and Treated Effluent Management

Objective: Prevent pollution of surface water resources, runoff, and health-related impacts on third parties.

TABLE 7-9: EFFLUENT MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT	
		These commitments apply to <u>construction phase only</u>	
1	Domestic wastewater management	Temporary sanitation will be provided onsite until the permanent sanitation facilities have been constructed and commissioned. Initially, portable toilets with associated septic tanks will be used. The septic tanks will be emptied on a regular basis by an appointed contractor for disposal at the Arandis municipal sewage treatment works.	
		These commitments apply to <u>operation phase only</u>	
2	Domestic wastewater management	Sewage will be managed, either with a French drain, septic tank or serviced chemical toilets. If septic tanks are used, it will be emptied on a regular basis by an appointed contractor for disposal at the Arandis municipal sewage treatment works. Permits must be obtained prior to any discharge of effluents / wastewater or sewage (see Section 2.1).	
3	Spillage of domestic wastewater	Prevent spillages of wastewater and sewage by properly maintaining and regularly inspecting containment facilities and conveyance infrastructure. Where spillage does occur, ensure it is properly contained.	
4		Ensure that checking for wastewater and sewage spills is included in periodical inspection checklists.	
5		Report spillages as per the incident management procedure and clean-up spills within 24 hours of the incident occurring.	
6	Pollution of soil and / or water	In the event of wastewater and sewage uncontained discharges, stop the incident as soon as possible and then find the root cause.	
7	when spillage or discharge occurs.	In the event of soil or water pollution, spills will be cleaned up/remediated immediately (within 24 hours) in line with spillage management procedure.	
8	Legal compliance	Conduct regular inspections and audits to ensure compliance, where required.	
9	Emergency	Major spillages incidents will be handled in accordance with the emergency response procedure.	
10	Training and awareness	Induct all relevant employees and contractors in the spillage management procedure.	

7.6.3.3 Spill Management

Objective: Prevent pollution of surface water resources, runoff, and health-related impacts on third parties.

TABLE 7-10: SPILLAGE MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Dealing with spills	Ensure that spill kits are in place.
2		Ensure that a system is in place to deal with hydrocarbon spills and subsequent clean-up thereof.
3		Contain any spills and commence with remediation within 24 hours. In this regard the remediation options include in situ treatment or disposal of contaminated soils as hazardous waste.
4		In cases where spills cannot be cleaned up immediately, monitor seepage into deeper soils and groundwater closely.
5		If contamination of water occurs, separate hydrocarbons from water and treat water before recycling and re-use.
6	Legal Compliance	Comply with all legal requirements regarding spills and containment structures.
7		Hydrocarbon spills of 200 L or more must be reported to MME in terms of Section 49 of the Petroleum Products Regulations 2000.
8	Monitoring of spills	Ensure that the monitoring of potential leaks and spills are included in the daily inspection program to develop an early detection system.
9		Identify post-rehabilitation audit criteria for verifying that remediation has been successful.
10	Awareness and training	Induct all employees and contractors in the spillage management procedure.
11		Train selected employees on containment, handling of spills and the de-contamination and rehabilitation of affected environments.
12	Emergency	Major spillages incidents will be handled in accordance with the emergency response procedure.
13		Identify and contract a service provider / specialist to assist with the handling and clean-up of emergency spills offsite.
14		Periodically test the emergency response.

7.7 GROUNDWATER MANAGEMENT

7.7.1 INTRODUCTION

Potential groundwater quality impacts are potential issues during the construction, operation, and decommissioning phases unless measures are undertaken to prevent and mitigate such impacts. Potential pollution sources from the proposed operations are expected to be of a diffuse nature. No significant groundwater quantity impacts are expected due to the nature of the project.

7.7.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Site preparation and general construction activities Storage and handling of hazardous substances Management of wastewater Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Fallout dust	Storage and handling of hazardous substances Management of wastewater Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Fallout dust	Demolition General decommissioning activities Storage and handling of hazardous substances Management of wastewater Waste management Equipment maintenance Utilisation of vehicles which may leak lubricants and fuel Fallout dust	N/A

7.7.3 GROUNDWATER MANAGEMENT AND MITIGATION PLAN

Objective: Prevent groundwater contamination

TABLE 7-11: GROUNDWATER MANAGEMENT PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u> only		
1	Contamination of groundwater	Engineered containment of sewage facilities, wastewater, waste storage areas and maintenance areas. Site speed limit and vehicle signage to reduce risk of vehicle accidents and spillage of hydrocarbons.
2	Training	Prevent pollution through education and training of workers (permanent and temporary).
3	Monitoring	As a surface water monitoring program will be implemented to monitor potential pollution impact on surface water resources, no direct groundwater monitoring program is necessary. Corrective action will be taken when necessary.
4	Emergency	Major spillage incidents will be handled in accordance with the emergency response procedure.

7.8 AIR QUALITY MANAGEMENT

7.8.1 INTRODUCTION

There are a few activities that have the potential to pollute the air. These activities are temporary in nature and will only last a few months. The most relevant offsite receptor points are the Arandis Railway Station accommodation site and residences within Arandis town, approximately 0.8 km and 1.7 km away respectively. No residual impacts are expected after closure.

7.8.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Site preparation and establishment General construction activities Earthworks for all surface infrastructure Soil stripping Construction of trenches and foundations Access road construction Vehicle movement Exhaust fumes (vehicles, generators)	Vehicle movement Exhaust fumes (vehicles)	General demolition activities Vehicle movement Exhaust fumes (vehicles)	N/A

7.8.3 AIR QUALITY MANAGEMENT AND MITIGATION PLAN

This management plan is made up of the following components:

- Dust management.

7.8.3.1 Dust Management

Objective: To limit TeraSun Energy's contribution to cumulative air pollution impacts.

TABLE 7-12: DUST MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to construction, operation and decommissioning		
1	Dust suppression	Dust suppression on temporary access and site roads through chemical binding agents and or water sprays combined with vehicle speed controls will be implemented to achieve a control efficiency of 90% and at least 75% respectively.
2	Monitoring	A fulltime weather station will be installed onsite and weather data will be obtained and monitored for management purposes. No fulltime collection and analysis of dust fall-out is necessary. However, if deemed necessary (e.g., for investigation purposes after a complaint), dust monitoring must be done in accordance with relevant standards. Data should be analysed, and appropriate action taken to correct non-conformances.
3	Auditing	In case dust monitoring is conducted, quarterly performance audits and inspections will be done to verify that the monitoring is taking place according to specifications and that the operation is adhering to the specified dust fallout indicators.
4	Complaints system	All air-related complaints will be documented, investigated and reasonable efforts made to address the area of concern

7.9 NOISE MANAGEMENT

7.9.1 INTRODUCTION

During the construction phase, a few activities may have the potential to generate noise. Potential receptors sites include the town of Arandis, and fauna. The incremental contribution to the baseline is considered negligible during the operational phase.

7.9.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Site preparation and establishment General construction activities Earthworks for all surface infrastructure Construction of trenches and foundations Equipment maintenance Access road construction Vehicle movement Generators	General site management activities Equipment maintenance Vehicle movement Waste management Support services and amenities	Demolition General decommissioning and rehabilitation activities Earthworks Vehicle movement Waste management	N/a

7.9.3 NOISE MANAGEMENT AND MITIGATION PLAN

Objective: Prevent an unacceptable increase in disturbing noise and limit nuisance noise at sensitive receptors as far as practically possible.

TABLE 7-13: NOISE MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>design</u>		
1	Design of facility	The layout of the PV Power Plant will be designed in such a way that maximum benefit is provided to the amenity of the local area and occupiers of the nearest noise-sensitive receptors.
These commitments apply to <u>construction, operation and decommissioning</u>		
2	Minimize noise during operations	It is considered that all activities onsite would produce minimal levels of noise.
3	Maintenance of vehicles and equipment	Vehicles and equipment will be regularly serviced and maintained in good working order. The sound of reverse hooters will be engineered in such a manner to limit audibility in the surrounding environment.

NO	ISSUE	MANAGEMENT COMMITMENT
4	Complaints system	All noise complaints will be documented, investigated and reasonable efforts made to address the area of concern. This may include consulting a noise specialist for mitigation advice.
5	Monitoring	Where necessary, noise monitoring will be used as part of the investigatory process into noise complaints and as part of the assessment of the impact of mitigation and, if required, the alteration thereof.

7.10 ARCHAEOLOGICAL RESOURCES MANAGEMENT

7.10.1 INTRODUCTION

There are several activities / infrastructure components in all phases of the project that have the potential to damage archaeological resources. These must be managed to minimize destruction of heritage resources.

7.10.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Site preparation and general construction activities Clearing and grubbing Trenching and excavations Preparation of foundations Compacting bases Access road construction Vehicles and equipment	General operational activities Waste management Support services and amenities	General demolition and rehabilitation activities Earthworks Waste management Vehicles and equipment	N/A

7.10.3 ARCHAEOLOGICAL MANAGEMENT AND MITIGATION PLAN

Objective: Minimize damage of heritage resources that may be caused by the proposed project.

TABLE 7-14: ARCHAEOLOGICAL MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u> phases		
1	Identification of archaeological sites	All workers (temporary and permanent) will be educated about the heritage and cultural sites that may be encountered and about the need to conserve these.
2		Contractors working on the site shall be made aware that under the National Heritage Act any items protected under the definition of heritage found during development should be reported to the National Heritage Council.

NO	ISSUE	MANAGEMENT COMMITMENT
3	Disturbance of archaeological sites	The relevant archaeological sites outside of the project footprint area will be demarcated to restrict incidental access to the various sites.
4	Emergency	If new heritage and or cultural resources are discovered, the project proponent will follow a chance find emergency procedure, which includes the following: <ul style="list-style-type: none"> • Work at the find will be stopped to prevent damage • An appropriate heritage specialist will be appointed to assess the find and related impacts • Permitting applications will be made to the National Heritage Council, if required.

7.11 VISUAL ASPECT MANAGEMENT

7.11.1 INTRODUCTION

Visual impacts may be caused by activities and infrastructure during all project phases. Views from the Rest Area on the B2 road at the Arandis junction and Hospital Road present the greatest visual exposure. The proposed development is however not likely to visually affect either of the nearby National Parks. Furthermore, once the proposed Arandis Town Plan is partially or fully implemented, visual impacts would reduce as the area would become industrial.

7.11.2 RELEVANT FACILITIES / ACTIVITIES

Construction	Operational	Decommissioning	Closure
Site preparation and general construction activities Clearing and grubbing Excavations and trenching Access road construction Vehicles and equipment	General operational activities Vehicles and equipment movement Waste management	General demolition and rehabilitation activities Earthworks Waste management Vehicles and equipment	N/A

7.11.3 VISUAL MANAGEMENT AND MITIGATION PLAN

Objective: Limit negative visual impacts.

TABLE 7-15: VISUAL DISTURBANCE MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to the <u>construction, operation and decommissioning</u>		
1	Minimising visual impacts	Land disturbance should be limited to what is absolutely necessary.
2		Manage all dust plume sources with dust suppressants to limit visual intrusion by dust in line with the air quality management plan (refer to Table 7-12).

NO	ISSUE	MANAGEMENT COMMITMENT
3		The use of night light will be kept to a minimum and will illuminate only that which is required. The use of standard high pole flood lights will be avoided.
4		Painting infrastructure with colours that blend in with the surrounding environment where possible. Advice on the appropriate colours should be sought from a visual impact expert.
5		Prevent littering.
6		Ongoing vegetation establishment on rehabilitated areas
7		In the decommissioning phase all infrastructure will be removed, and the site will be rehabilitated and re-vegetated.

7.12 WASTE MANAGEMENT

7.12.1 INTRODUCTION

The types of solid waste expected to be generated include:

- General waste (domestic waste and other non-hazardous waste).
- Hazardous waste.
- Medical waste.

Liquid waste (effluent and contaminated surface runoff) is dealt with under the surface water management plan.

7.12.2 SOLID WASTE MANAGEMENT AND MITIGATION PLAN

Objective: Ensure proper storage, removal, transportation, and disposal of all solid waste.

The solid waste management plan is outlined in Table 7-16 and should be read together with Table 7-17 .

TABLE 7-16: SOLID WASTE MANAGEMENT AND MITIGATION PLAN

NO	ISSUE	MANAGEMENT COMMITMENT
These commitments apply <u>construction, operation and decommissioning</u> phases		
1	Waste management hierarchy	<p>The following waste management hierarchy will be implemented:</p> <ul style="list-style-type: none"> • Waste minimisation. • Re-use and recover waste. • Treat waste if required. • Disposal in suitably permitted and managed landfills. <p>Each waste type will be assessed to see whether there are alternative uses for the material. This will be done as a priority before the disposal option.</p>

No	ISSUE	MANAGEMENT COMMITMENT
2	Classification and record keeping	<p>A waste management procedure that will cover the storage, handling, and transportation of waste to and from the site will be developed and implemented. Employees and contractors will be made aware of these procedures.</p> <p>An inventory of wastes will be compiled and will include estimated quantities of waste. The inventory will be kept up to date.</p> <p>Written evidence of safe disposal of all waste types will be kept.</p>
3	Waste collection in work areas	<p>Adequate skips and rubbish bins equipped with lids will be provided.</p> <p>Waste will be separated at source.</p> <p>Littering will be prohibited.</p> <p>Mixing of re-usable materials with other wastes, especially hazardous wastes will be prevented.</p> <p>Care will be taken to ensure that scrap metal and building rubble does not become polluted or mixed with any other waste.</p> <p>Onsite facilities will be provided for sorting and temporary storage prior to removal and disposal to appropriate recycling or disposal facilities offsite (Arandis for general waste and Walvis Bay for hazardous waste).</p> <p>During decommissioning and closure, laydown areas within the site footprint for re-usable non-hazardous materials will be established.</p>
4	Waste transport	<p>Waste will be transported to the licensed disposal facilities by an approved waste contractor.</p> <p>Vehicles transporting hazardous waste will be clearly marked.</p> <p>The integrity of transport packaging and containers will be appropriate to the type of waste being transported.</p> <p>Loading and unloading procedures will be followed to avoid spillage.</p>
5	Waste disposal	<p>No waste shall be burnt or buried onsite.</p> <p>Domestic waste will be disposed of to a licensed landfill site in Arandis.</p> <p>Hazardous waste will be disposed of to the licensed hazardous landfill in Walvis Bay.</p>
6	Waste management	The types of waste per project phase, storage and disposal procedures are provided in Table 7-17 below

Table 7-19 briefly outlines the procedure for the storage and disposal of solid wastes.

TABLE 7-17: WASTE STORAGE AND DISPOSAL PROCEDURE

WASTE TYPE	WASTE SPECIFICS (EXAMPLE OF WASTE TYPES)	STORAGE FACILITY	END USE
CONSTRUCTION AND DECOMMISSIONING PHASE			
Non-hazardous waste	Pallets and wooden crates, cable drums, scrap metal, general domestic waste such as food and packaging	Skips in relevant work areas will be provided for different waste types.	Waste will be sorted, and recyclable waste will be removed by a reputable recycling company. The remainder of the waste will be

WASTE TYPE	WASTE SPECIFICS (EXAMPLE OF WASTE TYPES)	STORAGE FACILITY	END USE
			transported by a waste management contractor to a licensed general landfill facility in Arandis for disposal.
	Building rubble and waste concrete	Designated rubble collection areas (offsite) will be identified to which contractors will take rubble and concrete.	The waste management contractor will regularly remove the waste from the designated collection points to a licensed disposal facility.
Hazardous solid waste	Hydrocarbon contaminated waste, treated timber crates, broken panels, printer cartridges, paint, tar, solvents, fluorescent bulbs, batteries, empty hazardous material containers etc.	Hazardous waste will be separated at source and stored in designated containers in dedicated bunded storage areas.	Hazardous waste will be disposed of at the licensed hazardous disposal site in Walvis Bay by the waste management contractor.
	Hydrocarbons	Used hydrocarbons will be stored in drums in dedicated bunded areas. The bunds will be able to accommodate 110 % of the container contents and include a sump and oil trap. The storage area will include a concrete slab, proper bunding and an oil sump.	Used oil will be sent to a reputable recycling company for recycling.
	Sewage	Sewage will be contained	
Medical waste	Medical waste such as material with blood stains, bandages, etc.	Medical waste will be stored in sealed containers for this purpose.	Medical waste will be removed by the waste management contractor to a licensed incineration facility in Swakopmund for incineration.
OPERATIONAL AND DECOMMISSIONING PHASE			
Non-hazardous solid waste	Pallets and wooden crates, rubber, cardboard, paper, cable drums, metal cut-offs. scrap metal, general domestic waste such as food and packaging	Containers will be provided and used for different waste types. A waste management contractor will remove the containers regularly.	Recyclable waste will be sent to a reputable recycling company. The remainder of the waste will be removed by the waste management contractor to a licensed general landfill facility in Arandis for disposal.
	Building rubble and	Designated rubble collection points will be	Building rubble will be disposed of at a licensed waste disposal

WASTE TYPE	WASTE SPECIFICS (EXAMPLE OF WASTE TYPES)	STORAGE FACILITY	END USE
	waste concrete	determined to which rubble and concrete will be taken.	facility.
Hazardous solid waste	Treated timber crates, printer cartridges, batteries, fluorescent bulbs, paint, solvents, tar, empty hazardous material containers, broken panels, etc.	Hazardous waste will be separated at source and stored in designated containers in banded work areas. The waste management contractor will remove these containers regularly for disposal.	Hazardous waste will be disposed of at the licensed hazardous disposal site in Walvis Bay by a waste management contractor.
	Sewage	Sewage will be contained	Sewage will be contained
Medical waste	Medical waste such as material with blood stains, bandages, etc.	Medical waste will be stored in sealed containers for this purpose.	Medical waste will be removed by the waste management contractor to a licensed incineration facility in Swakopmund for incineration.

7.13 SOCIO-ECONOMIC ASPECT MANAGEMENT

7.13.1 INTRODUCTION

The project will have socio-economic impacts in all phases. Some of these are positive impacts such as economic development, while others are negative impacts such as increased pressure on infrastructure, society and the tourism industry.

7.13.2 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Construction and initial operational activities Recruitment of contractors and workers	Operational activities Recruitment of contractors and workers	Decommissioning activities Dismissal of contractors and workers	Aftercare and maintenance activities

7.13.3 SOCIO –ECONOMIC MANAGEMENT AND MITIGATION PLAN

Objectives:

- Enhance the positive impacts and limit the potential negative impacts associated with the employment, procurement and skills training.
- Minimize the impact of in-migration of job seekers and the associated community health.
- Minimize the impact on government services.

TABLE 7-18: SOCIO-ECONOMIC IMPACT MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>construction, operation and decommissioning</u>		
1	Enhancement of positive economic impacts	<p>Recruitment of nationals, in particular local people.</p> <p>Payment of competitive salaries and wages to nationals.</p> <p>Local procurement whenever possible and encourage employees and the community to do the same.</p> <p>A recruitment office is set-up in Arandis for both the construction and operations phases; to ensure that local people are considered first, followed by people from the rest of the Erongo Region and then other Namibians. Several local institutions offered to share their database of skilled artisans and service providers to maximize benefits to the local community.</p> <p>Development and implementation of socio-economic management policies which will promote positive impacts. Training of local and regional contractors, beginning before the project commences.</p> <p>Promote small and medium enterprises (SME) development wherever possible.</p> <p>Use small-scale contractors wherever possible.</p>
2	Skills training and procurement	<p>Up-front skills training, particularly to potential employees currently living in Arandis and the Erongo Region.</p> <p>Training of local employees will continue throughout the life of the operation.</p> <p>Technical training and skills development will form part of the training program.</p> <p>The government policy of improving gender equality and the empowerment of women will be supported.</p> <p>Provide support to NIMT, based in Arandis, and ATC in working towards the town becoming a centre of education excellence.</p>
3		<p>Tender selection criteria will include suppliers of goods and services which use local suppliers down the supply chain. Support the development of a workers database together with ATC and suggest that this is made available to construction contractors.</p> <p>Procurement policies will promote the use of SMEs.</p> <p>The human resources policy will support the selection of women for training and recruitment and support women to perform well in the workplace while balancing their other duties in the family and community.</p> <p>Support employees and community members to continue learning and developing skills so they too benefit from being able to offer labour flexibility and productivity.</p>

No	ISSUE	MANAGEMENT COMMITMENT
4	Minimize loss of jobs and economic impact upon closure	<p>In preparation for decommissioning and of planned and unplanned closure, the following steps will be taken:</p> <ul style="list-style-type: none"> • Promote continuous learning programs to diversify and upgrade skills. • Maximize the permanent workforce and make pension plans compulsory. • Provide training on personal financial management. • Enable and promote home ownership. • Ensure that closure planning considerations incorporate the following aspects: <ul style="list-style-type: none"> ○ the skilling of employees for the downscaling, early closure and long-term closure scenarios ○ the needs of tourism for the downscaling, early closure and long-term closure scenarios.
5	In-migration and social ills	<p>A representative stakeholder committee together with ATC to monitor social impacts and the effectiveness of the mitigation measures will be put in place.</p> <p>Broadly disseminate information on the actual number of skilled and unskilled positions available during all project phases to manage expectations.</p> <p>A policy of zero tolerance to alcohol in the workplace will be implemented and all personnel arriving for work on every shift will breathalyse.</p> <p>Establish a comprehensive HIV / AIDS / TB workplace policy and employees' wellness program. Tender requirements for all contractors will stipulate clear HIV policies and programs. These will be part of their reporting requirements.</p> <p>Close collaboration with ATC and the MoHSS will ensure support and partnerships that encourage a sense of community that combats social ills, e.g., multi-purpose community and skills development centres; networking points for new migrants; sports tournaments, social clubs, youth clubs, activities that promote women's empowerment that can lead to gender equality, and community policing.</p>
6	Increased pressure on government services	<p>Collaboration with ATC and other stakeholders will ensure engagement with the relevant authorities to ensure that the planned upgrading of government services is implemented, that the basic health services are provided to the workforce during all phases of the project and for the benefit of all parties.</p>

7.14 TRAFFIC MANAGEMENT

There are several transportation activities in all phases of this proposed project that have the potential to impact on the existing road transportation infrastructure and community safety. The increase in transportation activities during the construction and decommissioning will be temporary in nature, while the operational activities will be of a long-term nature. No impacts are expected in the closure phase.

7.14.1 RELEVANT FACILITIES / ACTIVITIES

CONSTRUCTION	OPERATIONAL	DECOMMISSIONING	CLOSURE
Vehicle movement associated with earth	Deliveries Transportation of	Vehicle movement associated with	N/A

moving activities Transportation of construction workers Deliveries, including abnormal vehicles	operational personnel Collection activities, in particular waste items	demolition and rehabilitation activities Transportation of workers	
--	---	---	--

7.14.2 TRAFFIC MANAGEMENT AND MITIGATION PLAN

Objective: Minimize the impact on road transport infrastructure and community safety.

TABLE 7-19: TRAFFIC IMPACT MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>design</u>		
1	Access point	Submit detailed design drawings to the various authorities for approval of the site access from the D1911 road. Ensure changes to road infrastructure comply with the requirements of the Road Authority.
These commitments apply to <u>construction, operation and decommissioning</u>		
2	Community safety	Traffic and information signs, road markings and lighting will be provided where relevant. Dedicated pedestrian routes will be identified and implemented in conjunction with ATC. Signage and pedestrian routes will be properly maintained. All persons working onsite are expected to conform to the site traffic rules: <ul style="list-style-type: none"> • Adhere to speed limits. • Ensure drivers have valid driver licenses. • All vehicles should be roadworthy. • Zero tolerance for drinking and driving. • Drive with lights on when onsite. Co-ordinate transport of heavy loads with RA. Transport hazardous substances in line with the requirements as indicated on the MSDS
3		Together with other stakeholders, engage with RA to address the predicted decline in the level of service of the Arandis intersections.
4.	Training	Road traffic will be included in the general awareness training programs for employees, which includes contractors.
5	Emergency	Any road accident involving or caused by project related traffic will be handled in accordance with the emergency response procedure.

7.15 CARBON MANAGEMENT

There are several activities in all phases of this proposed project that have the potential to impact on the carbon footprint of the project. The carbon footprint, which will result from construction and decommissioning activities will be temporary in nature. Activities during the operational phase will however result in a longer-term carbon footprint. No impacts are expected in the closure phase.

RELEVANT FACILITIES / ACTIVITIES

Construction	Operational	Decommissioning	Closure
Exhaust fumes (vehicles, generators) Construction activities and materials	Exhaust fumes (vehicles, generators) Utilisation of consumables Waste management Wastewater Transportation activities	Demolition and earthwork activities Exhaust fumes (vehicles, generators)	N/A

7.15.1 CARBON MANAGEMENT AND MITIGATION PLAN

Objectives: To minimize the impact on the carbon footprint.

TABLE 7-20: CARBON MANAGEMENT AND MITIGATION PLAN

No	ISSUE	MANAGEMENT COMMITMENT
These commitments apply to <u>all phases of the project</u>		
1	Resources consumption	Resources such as process consumables and water will utilised efficiently during all phases of the project.
These commitments apply to <u>the operational phase</u>		
2	Maintenance	Ensure that an ongoing and comprehensive maintenance program is implemented to ensure that the PV Power Plant operates optimally.

8. MONITORING PLAN

8.1 INTRODUCTION

This section outlines the monitoring plan for the PV Power Plant and its activities.

As a general approach, the monitoring programs will comprise the following:

- A formal procedure.
- Appropriately calibrated equipment – regular inspections and calibration of equipment will be undertaken in line with the equipment calibration / validation procedure.
- Where samples require analysis, they will be preserved according to laboratory specifications.
- Where practical, an accredited, commercial laboratory will undertake sample analyses.
- Parameters to be monitored can be identified in consultation with a specialist in the field and or the relevant authority.
- If necessary, following the initial monitoring results, certain parameters may be removed from the monitoring program in consultation with a specialist and or the relevant authority.
- Monitoring data will be stored in a structured database.
- Data will be interpreted and reports on trends in the data will be compiled on a quarterly basis.
- Both the data and the reports will be kept on record for the life of mine.

As a general comment, if monitoring points become damaged or redundant then they can be replaced with new points.

8.2 AIR QUALITY MONITORING

No air quality monitoring is necessary. Where necessary, the monitoring of fall-out dust will be done as part of the investigatory process into complaints about dust and as part of an assessment of the impact of mitigation and, if required, the alteration thereof. In such a case, fall-out dust monitoring must be done in accordance with relevant standards. Data should be analysed, and appropriate action taken to correct non-conformances quarterly performance audits and inspections will be done to verify that the monitoring is taking place according to specifications and that the operation is adhering to the specified dust fallout indicators.

8.3 NOISE MONITORING

Where necessary, noise monitoring will be used as part of the investigatory process into complaints about noise and as part of the assessment of the impact of mitigation and, if required, the alteration thereof. In such a case, a noise monitoring program will be undertaken at the nearest receptor areas to confirm whether noise levels are within the relevant guideline values

8.4 SOIL MANAGEMENT MONITORING

Regular inspections of soil stockpiles and rehabilitated areas will be undertaken to ensure that the topsoil management plan is being properly implemented.

8.5 WASTE MANAGEMENT AND DISPOSAL MONITORING

Regular inspections of all waste handling and management facilities will be undertaken to ensure that the waste management procedures are being properly implemented. The volume and type of waste, and the disposal destination, will be monitored and recorded as required. Safe disposal certificates will be kept on file.

8.6 RE-ESTABLISHED PROTECTED PLANTS

Develop and formalize procedures for periodic inspections and reporting of success and progress on re-established plants. If necessary, consult with an acknowledged botanist.

8.7 AVIFAUNA

Develop and formalize procedures for periodic inspections and reporting of injuries and or mortalities of birds. If necessary, consult with an avifauna specialist (see Section 7.5.3 for further actions).

9. PERSONS RESPONSIBLE FOR IMPLEMENTING THE EMP

During the construction phase, the contractors responsible for the engineering, procurement, and construction (EPC) of the plant, will be responsible for implementing the requirements of the EMP. This requirement will be included in the respective EPC contracts. During the operational phase, Operations and Maintenance (O&M) contracts will be put in place for the O&M of the plant, which will include the implementation of the EMP.

An Environmental Officer onsite will be responsible for co-ordinating the implementation of the EMP.

Other responsibilities will include:

- Inspections and auditing.
- Provide environmental awareness training to all employees and temporary workers.
- Implement the monitoring plan onsite.
- Ensure compliance to this EMP.
- Ensure compliance to any authorizations issued.
- Regular reporting as required by any authorizations issued.
- Implement and manage the stakeholder complaints and grievance procedure.
- Stakeholder engagement.

At this stage it is envisaged that this department will be headed up by an Environmental Manager.

It should also be noted that any contractors used during any phase of the project will also be responsible for implementing this EMP.

10. MONITORING AND AUDITING COMPLIANCE TO THE EMP

10.1 AUDITS AND INSPECTIONS

The Environmental Officer will conduct internal management audits against the commitments in the EMP. During the construction phase, daily inspections and two-weekly audits will be conducted. In the operational phase, weekly inspections and quarterly audits will be conducted. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

In addition, an independent professional will conduct an EMP performance assessment on annual basis. Compliance with the commitments of the EMP and the continued adequacy of the EMP relative to the onsite activities will be assessed in this report.

10.2 SUBMISSION OF INFORMATION

Monitoring reports will be provided to the relevant authorities as per permits and authorisations issued by the relevant departments and ministries.

11. REFERENCES

African Conservation Services, 2019 (for SLR). Environmental Impact Assessment amendment to the Husab Mine: proposed onsite 12 MW solar PV plant Avifaunal baseline / scoping and assessment study.

African Wilderness Restoration (AWR), 2014. Biodiversity Baseline Report and Impact Assessment for the proposed extension to the existing Arandis Thermal Power Generation and Waste Oil Recycling Plants. Unpublished Report to SLR Namibia.

Enviro Dynamics, 2012. Environmental Impact Assessment for the proposed construction of the west coast transmission lines – Erongo Coal Power Station (ECPS) to the existing Walmund – Rössing Transmission Line. Unpublished report for NamPower.

Mannheimer, 2021. Mapping of plant species of conservation concern at the proposed site for the PV Power Plant of TeraSun Energy near Arandis. Unpublished report to Namisun.

Namisun, 2022. EIA (Amendment) Report for the proposed PV Power Plant of TeraSun Energy near Arandis, Erongo Region. Unpublished report submitted to the MEFT.

SLR Environmental Consulting (Namibia) (Pty) Ltd., 2012. Scoping Report (including impact assessment) for the proposed amendment to the Arandis Thermal Power Generation and Waste Oil Recycling Plants. SLR Consulting. SLR Project Ref No.: 7NA.14008.00001. September 2012.

SLR Environmental Consulting (Namibia) (Pty) Ltd., 2014. Environmental Management Plan for the proposed Arandis Hybrid Thermal / Photovoltaic Power Plant. SLR Project No.: 734.14008.00001. July 2014.

APPENDIX A: ARANDIS POWER SUSTAINABILITY POLICY



Arandis Power (Pty) Ltd is an independent power producer based in the Erongo Region in Namibia. We are committed to operating our activities in a responsible manner that meets the needs of the present without compromising the ability of future generations to meet their own needs. To do this we aim to ensure that our business is:

- Economically sound and financially profitable,
- Socially responsible, and
- Operated in a safe and environmentally responsible manner.

Arandis Power is committed to achieving world-class sustainable development and will therefore:

- Incorporate sustainable development principles in all aspect of our business.
- Implement and maintain risk management strategies that take cognizance of sustainable development risks and mitigating procedures.
- Implement and maintain ethical business practices and sound corporate governance processes.
- Implement and maintain an effective and transparent stakeholder engagement process.
- Develop capacity to ensure the future well-being of our employees.
- Safeguard the health and safety of all our stakeholders.
- Promote fundamental human rights.
- Support meaningful and sustainable local community development programs.
- Ensure continual improvement in environmental performance, specifically in optimizing resource utilization, conserving biodiversity and minimizing any negative impacts from our operations on the environment.
- Facilitate and encourage responsible energy use.
- Implement social transformation policies and practices in line with relevant legislation and in the interests of creating a diverse and balanced workforce.

Arandis Power furthermore undertakes to measure, record, independently verify and report on all material sustainable development issues on a regular and transparent basis.

APPENDIX B: ARANDIS POWER ENVIRONMENTAL POLICY

Arandis Power (Pty) Ltd is an independent power producer based in the Erongo Region in Namibia. We are committed to operating our activities in a responsible manner to avoid, reduce and or mitigate our impacts on the environment.

To achieve excellence in environmental performance in a sustainable manner, we are committed to:

- Integrating environmental management our business model.
- Complying with all applicable Namibian policies, regulations and guidelines and where no local legislation exists, adhering to international good practice.
- In our area of impact, identifying and managing significant environmental aspects of our business in order to:
 - optimise resource consumption,
 - protect environmental biodiversity,
 - minimize the social, environmental and economic impacts,
 - minimize the release of effluent,
 - minimize the generation waste,
 - rehabilitate disturbed land where possible,
 - safeguard cultural heritage resources,
 - mitigate our impact on climate change.
- Putting into place an integrated environmental management system and action plans for all significant aspects and set targets in key areas. Progress towards these targets will be monitored and reported on a regular basis to Arandis Power's management, internal and external stakeholders.
- Promoting education, training and motivation of employees to raise their environmental awareness and conduct.
- Sharing information with interested and affected parties to inform them of our environmental performance.
- Integrating risk and closure planning into the project development and management and ensuring that funds are put aside during the project's lifetime to meet our rehabilitation and closure commitments.

This policy and associated objectives and targets will be regularly reviewed to ensure that they adequately reflect our commitment to continually improving our environmental management systems and performance. This policy will be communicated to and applied by all our employees, contractors and suppliers and will be made available to the public.