

## REPORT

# AMENDED ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED 75MW CONCENTRATING SOLAR THERMAL POWER PLANT AND ASSOCIATED INFRASTRUCTURE

**Client:** ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd

**Reference:** MD2562\_R001\_D0.1

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Classification

Project related



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## Acronyms

Acronym	Description
ASME	American Society of Mechanical Engineers
API	American Petroleum Institute
BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
CLO	Community Liaison Officer
CSP	Concentrated Solar Power
DAFF	Department of Agriculture, Fisheries and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ELO	Environmental Liaison Officer
ERP	Emergency Response Plan
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IAP	Alien Invasive Plant
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
KV	KiloVolts
MC	Main Contractor
MMP	Maintenance Management Plan
MSDS	Material Safety Data Sheets
MW	MegaWatt
LM	Local Municipality
NCR	Non-Conformance Report
NC DENC	Northern Cape Department of Environmental and Nature Conservation

Acronym	Description
NDP	National Development Programme
NDT	Non-destructive Testing
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	National Environmental Management Air Quality Act (Act No. 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act (Act No. 10 of 2004)
NEM:PAA	National Environmental Management Protected Areas Act (Act No. 57 of 2003)
NEM:WA	National Environmental Management – Waste Act (Act No. 59 of 2008)
NFA	National Forests Act (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystems Protected Areas
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act (Act No 85 of 1993)
PIA	Palaeontological Impact Assessment
PM	Project Manager
PPE	Personnel Protective Equipment
PPP	Public Participation Process
PV	Photovoltaic
QMS	Quality Management System
RoW	Right of Way
SACNASP	South African Council of Natural Science Professionals
SADC	Southern African Development Community
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SASS	South African Scoring System
SAPAD	South African Protected Areas Database
SCA	Systemic Conservation Assessments
SDC	Safe Disposal Certificates
SEF	Site Environmental File



Acronym	Description
SEPA	State Environmental Policy Act
SHE	Safety, Health and Environmental
WUA	Water Use Authorisation
WUL	Water Use Licence

## Glossary

TERM	DESCRIPTION
<b>Building And Demolition Waste</b>	Building and demolition waste means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any building structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition.
<b>Construction Project Management Team</b>	The key team members for implementation of the Environmental Management Programme include a Project Manager, Site Engineer, Safety and Health Officer and an Environmental Control Officer.
<b>Contractor-Or Sub-Contractor</b>	Companies and or individual persons appointed on behalf of the Developer to undertake construction activities.
<b>Corrective Action</b>	A plan created by management to address, correct or eliminate a non-conformance that has occurred.
<b>Development</b>	Means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint; Carrying out any works on or over or under a place; Constructing or putting up for display signs or boards; Any change to the natural or existing condition or topography of land; and Any removal or destruction of trees, or removal of vegetation or topsoil.
<b>Degradation</b>	The lowering of the quality of the environment through human activities e.g. river degradation, soil degradation, atmospheric degradation.
<b>Demolition</b>	Demolition is the tearing-down of buildings and other structures, the opposite of construction. Demolition contrasts with deconstruction, which involves taking a building apart while carefully preserving valuable elements for re-use.
<b>Domestic Waste</b>	Domestic waste means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes generated directly by the consumption of products for domestic use.

TERM	DESCRIPTION
<b>Environment</b>	Environment means the surroundings within which humans exist and that are made up of, including: The land, water and atmosphere of the earth; Micro-organisms, plants and animal life; any part or combination of (i) of (ii) and the interrelationships among and between them; and The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
<b>Emergency</b>	An undesired event that results in a probable significant environmental impact and requires the notification of the relevant statutory body such as a local or provincial authority.
<b>Environmental Control Officer</b>	An individual nominated through the developer to monitor and audit the implementation of the EMP conditions on a monthly basis.
<b>Environmental Impact</b>	A change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
<b>Environmental Assessment Report</b>	Document developed during the initial planning stages of a project. The document highlights specific environmental issues which may impact on the project throughout its lifetime and includes mitigation measures which must be implemented by the Contractor during the construction phase.
<b>Environmental Site Officer</b>	An individual appointed by the Contractor to be present on site, to act on behalf of the Contractor in matters concerning the implementation of and day to day monitoring of the EMP.
<b>Environmental Management Programme</b>	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of the project. This EMP focuses on the planning phase, construction phase, operation (maintenance) phase and decommissioning phase of the project.
<b>General Waste</b>	Refers to waste that does not pose an immediate hazard or threat to health or to the environment, and includes: (a) Domestic waste; (b) Building and demolition waste; (c) Business waste; and (d) Inert waste.
<b>Groundwater</b>	All subsurface water that fills voids between highly permeable ground strata comprised of sand, gravel, broken rocks, porous rocks, etc. and move under the influence of gravitation.

TERM	DESCRIPTION
<b>Hazardous Waste</b>	Refers to any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
<b>Heritage Resources</b>	This means any place or object of cultural significance, including all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people.
<b>Impact</b>	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
<b>Incident</b>	An undesired event which may result in a significant environmental impact but can be managed through internal response.
<b>Integrated Environmental Management (IEM)</b>	Is a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity - at local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).
<b>Interested And Affected Party</b>	A person, group of persons or organisation interested in or affected by a development.
<b>Method Statement</b>	A method statement is a written submission by the Contractor to the Engineer in response to the specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting a Method Statement. It contains sufficient detail to enable the Engineer to assess whether the Contractor's proposal is in accordance with the Specifications and/or will

TERM	DESCRIPTION
	produce results in accordance with the Specifications.
<b>Mitigation</b>	Measures designed to avoid, reduce or remedy adverse impacts.
<b>Pollution</b>	Any change in the environment caused by – substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
<b>Project Manager</b>	A person appointed by the Developer to oversee the overall project management and the management of the professional project team.
<b>Recycle</b>	A process where waste is reclaimed for further use, this involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material.
<b>Rehabilitation</b>	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before disruption.
<b>Re-Use</b>	To utilise articles from the waste stream again for a similar or a different purpose without changing the form of properties of the articles.
<b>Screening</b>	Is the process that determines whether or not a development proposal requires environmental assessment and the level of assessment required. Screening is therefore a decision-making process that is initiated during the early stages of the development of a proposal
<b>Sustainable Development</b>	According to World Commission on Environment and Development (1987), this is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
<b>Toolbox Talk</b>	Short talks that focus on a specific topic e.g. manual handling, working at heights etc. It explores the risks of specific health and safety issues and ways to deal with them. It helps inform inexperienced workers and provide reminders to experienced workers of correct control measures.
<b>Waste</b>	Waste means any substance, whether or not that substance can be reduced, re-used, recycled and recovered - That is surplus, unwanted, rejected, discarded, abandoned or disposed of;

TERM	DESCRIPTION
	<p>Which the generator has no further use of for the purposes of production;</p> <p>That must be treated or disposed of; or</p> <p>That is identified as a waste by the relevant Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but a by-product is not considered waste; and any portion of waste, once re-used, recycled and recovered, ceases to be waste.</p>
<b>Waste Disposal Facility</b>	<p>Waste disposal facility means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premises.</p>
<b>Watercourse</b>	<p>Can be a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and/or d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse.</p>
<b>Wetland</b>	<p>Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with mustow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.</p>
<b>Workforce</b>	<p>The entire project team including people employed by the Developer directly, the Principal Agent or the Contractor, persons involved in activities related to the project, or person present at or visiting the construction area, including permanent contactors and casual labour.</p>

## 1 INTRODUCTION

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Increasing economic growth and social development within South Africa is placing a growing demand on energy supply. Coupled with the rapid advancement in economic and social development, is the growing awareness of environmental impact, climate change and the need for sustainable development. Whilst South Africa relies heavily on coal to meet its energy needs, the country is well endowed with renewable energy resources that offer sustainable alternatives to fossil fuels. Renewable energy harnesses naturally occurring non-depletable sources of energy, such as solar, wind, biomass, hydro, tidal, wave, ocean current and geothermal, to produce electricity, gaseous and liquid fuels, heat or a combination of these energy types. The successful use of renewable energy technology in South Africa still requires extensive investigation, however, Concentrating Solar Power (CSP) technologies have been identified as being potentially viable and capable of being employed on a large scale.

### 1.1 Context and Background

South Africa has a high level of renewable energy potential and to this end the South African Government has set a target of 10 000 GWh renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This equates to approximately 4% (1 667 MW) of the projected electricity demand for 2013 (41 539 MW). To contribute towards this target and towards socio-economic and environmentally sustainable growth, and to kick-start and stimulate the renewable energy industry in South Africa, an appropriate market mechanism, the Renewable Energy Feed-in Tariff or REFIT programme, has been proposed by the National Energy Regulator of South Africa (NERSA).

The establishment of the REFIT will provide an excellent opportunity for South Africa to increase the deployment of renewable energy in the country and contribute towards the sustained growth of the sector in the country, the region and internationally. Feed-in Tariffs (FIT) are, essentially, guaranteed prices for electricity supply rather than conventional consumer tariffs. The capital costs involved in the development and construction of renewable energy generating facilities far outweighs the incremental costs of typical, fossil fuel generation plant expansion and continued usage. The basic economic principle underpinning the REFIT is the establishment of a tariff (price) that covers the cost of generation plus a "reasonable return" to encourage developers to invest. The proposed project involves diversification of electricity production fuel sources, improved efficiency in electricity production, a decrease in the quantity of fossil fuel burned, a decrease in Greenhouse Gas (GHG) emissions and a decrease in a number of other aerial pollutant emissions. These can all be seen as making a contribution to improving the sustainability of development in South Africa. This is in line with Government's commitment to reduce the country's emissions by 34% by 2020 and 42% by 2025 with financial and technical support from the international community. The project can therefore be seen as making a contribution to improving the sustainability of development in South Africa.

The proposed Solafrica CSP project is likely to qualify for registration as a Clean Development Mechanism (CDM) project as the proposed development will lead to reductions in Greenhouse Gases (GHGs) due to the resultant reduction in electricity that will need to be produced from power plants using non-renewable resources like coal. A CDM is a project based instrument that allows public or private entities to trade in GHG mitigating activities in developing countries and earn abatement credits called Certified Emissions Reductions (CERs). If the project is formally registered with the Executive Board of the CDM, managed by the United Nations Framework Convention on Climate Change, the reductions in GHGs levels achieved by the project can be registered as Certified Emission Reductions (CERs) allowing Solafrica to sell CERs (the formal name for carbon credits) to buyers who need these credits for compliance purposes in developed countries. In light of the above, Solafrica intends to develop the project as a CDM project and to generate and sell CERs to support the financial viability of the project. The CDM requirements with regards to the CSP project include the following:

- Requirements defined by the international process include:
  - Projects must result in real, measurable and long-term emission reductions, as certified by a third party agency;
  - Emission reductions must be additional to any that would occur without the project, and
  - Projects must be in line with sustainable development objectives, as defined by the national government. In South Africa this is the Department of Energy which is the relevant national authority for CDM.

South Africa experiences some of the highest levels of solar radiation in the world. The average daily solar radiation in South Africa varies between 4.5 and 6.5 kWh/m<sup>2</sup> (16 and 23 MJ/m<sup>2</sup>), compared to approximately 3.6 kWh/m<sup>2</sup> for parts of the United States and  $\pm$  2.5 kWh/m<sup>2</sup> for Europe and the United Kingdom. **Figure 1** below illustrates the annual solar radiation (direct and diffuse) for South Africa, which identifies significant solar resource potential for solar water heating applications, solar photovoltaic and solar thermal power generation.

In 2006, Eskom Holdings Limited conducted an Environmental Impact Assessment (EIA) Study for a pilot CSP plant with an installed capacity of approximately 100MWe. Through a series of feasibility studies and high level assessments undertaken by Eskom - land availability, land use capability, fuel availability and costs, grid connection capacity and strengthening effects, and DNI measurements were considered in the selection of feasible sites. Based on the afore-mentioned considerations the Northern Cape Province ranked as the most favourable area for the establishment of a new CSP plant. Within the Northern Cape Province, the Upington and Groblershoop areas were specifically identified as potential areas for the establishment of the CSP plant – the farms Olyvenhouts Drift, Bokpoort and Tampansrus were selected for further detailed investigation. Subsequent to the Scoping and EIA studies, the farm Olyvenhouts Drift was selected as the preferred site and with consideration of the site specific environmental sensitivities, a preferred location for the plant on the farm was selected. Eskom received authorisation from the Department of Environmental Affairs to construct the CSP plant during 2006.



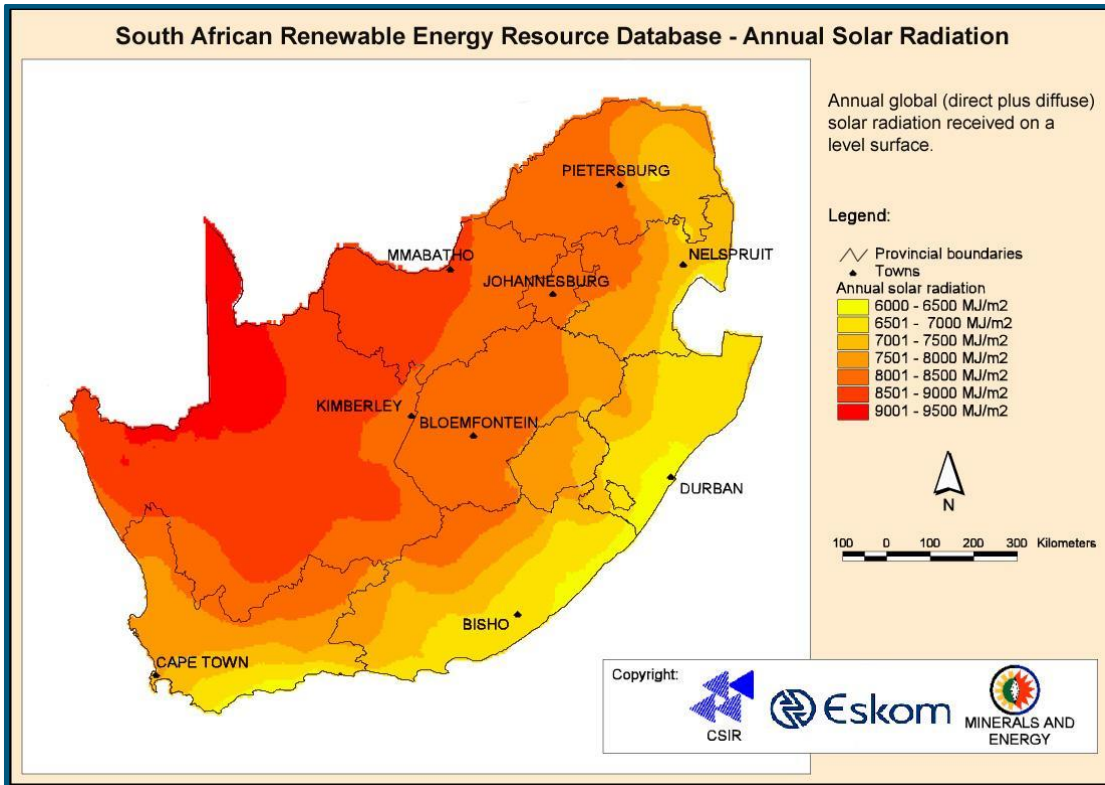


Figure 1: Annual Incoming Short Wave Radiation for South Africa (Courtesy: DME, Eskom, CSIR)

Table 1: International Solar Potential Relative to South Africa

Location	Site Latitude	Annual DNI (kWh/m <sup>2</sup> )	Relative Solar Resource
<b>South Africa</b>			
Upington, Northern Cape	28°S	2955	100%
<b>United States</b>			
Barstow, California	35°N	2725	92%
Las Vegas, Nevada	36°N	2573	87%
Albuquerque, New Mexico	35°N	2443	83%
<b>International</b>			
Northern Mexico	26 - 30°N	2835	96%
Wadi Rum, Jordan	30°N	2500	85%
Quarzazate, Morocco	31°N	2364	80%
Crete	35°N	2293	78%
Jodhpur, India	26°N	2200	74%
Spain	34°N	2100	71%

Against the backdrop of the above Eskom CSP EIA, Solafrica proposes the construction and operation of a CSP plant associated infrastructure in the Northern Cape Province in the region of two of the alternative sites identified during the Eskom CSP EIA study. The close proximity to the Eskom sites arises from the fact that the selection of feasible sites was guided by similar considerations as mentioned above. The two alternative sites identified by Solafrica were (refer to Figure 1 for the locality map):

- Site 1: Olyvenhouts Drift (15 km west of Upington), and
- Site 2: Bokpoort 390 (northwest of Groblershoop).

The power station is proposed to operate at an installed generation capacity of a maximum 75 MW. The exact output will depend on the generating technology utilised, the specification of the equipment installed, and the ambient operating conditions. The potential impacts associated with the maximum output of 75 MW have been evaluated within the environmental studies. The footprint of the proposed CSP plant is conservatively estimated at 350 hectares (ha).

It is preferred that the proposed power plant will utilise a wet cooling method to condense steam, used to drive a turbine, back into water. According to an engineering pre-feasibility study completed by Hatch during July 2010, the plant operation will require approximately 859 000 m<sup>3</sup> of water per year. The environmental impact assessment has been based on this maximum amount of water that may be used and the associated abstraction system. If this volume of water is not available from the water resource, the plant will utilise dry cooling or a wet-dry hybrid system employing both evaporative and dry cooling components. In such cases, the overall impact will be lower in respect of water use and transfer.

Project related

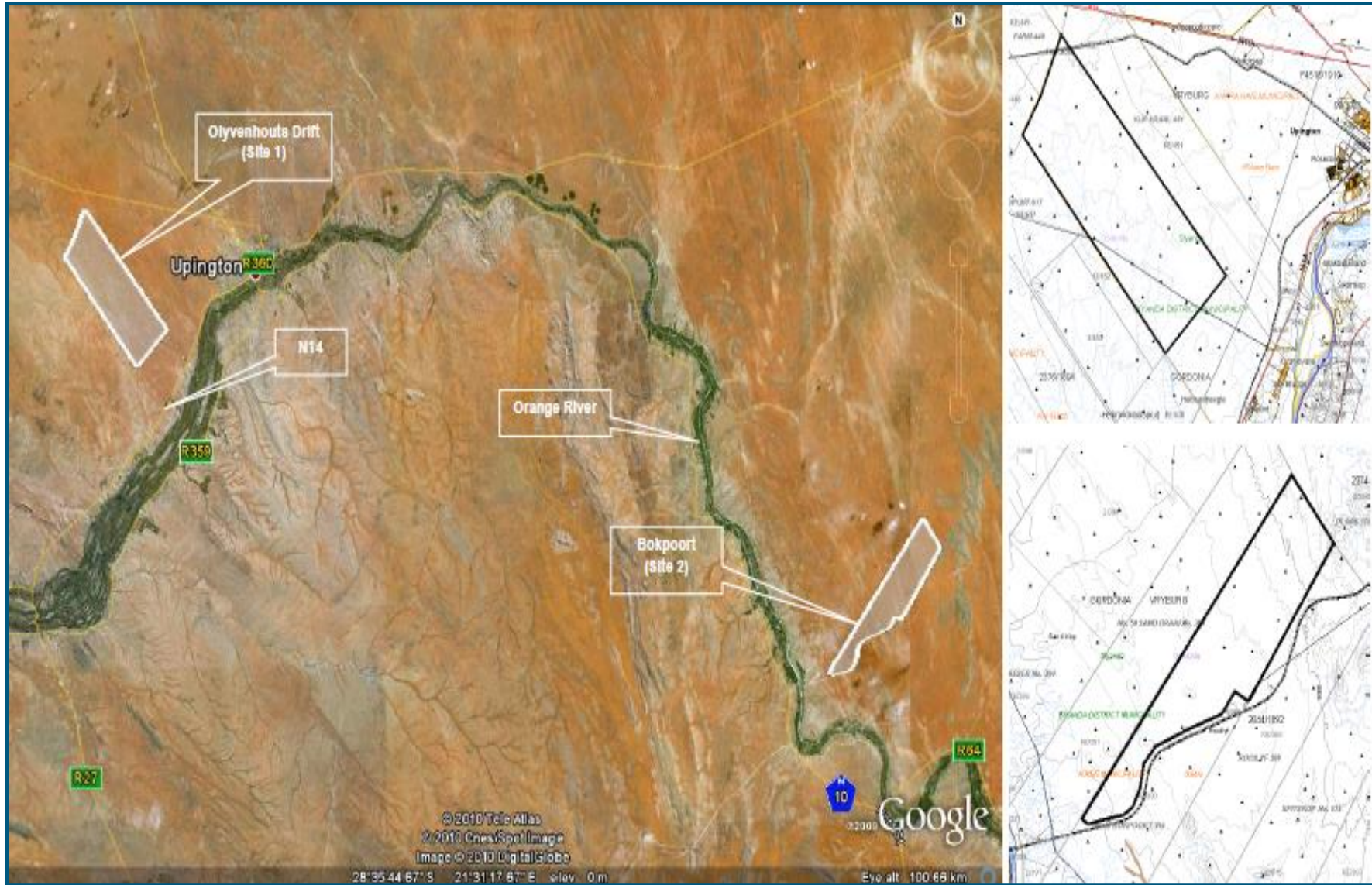


Figure 2: Locality Map Showing the Two Alternative Sites Considered for the Construction of the CSP Plant

## 1.2 Project Description

The proposed 75MW Concentrating Solar Thermal Power Plant (CSP) and associated infrastructure as described below was approved by the Department of Environmental Affairs (DEA) on the **14<sup>th</sup> of June 2011**.

### 1.2.1 75MW Concentrating Solar Thermal Power Plant (CSP)

The existing facility comprises Parabolic Trough Technology and has a generating capacity of **50MW**, two thirds of the original authorised application (**75MW**). The following activities were applied for:

- A power block consisting of 4 heat exchangers (the length of the heat exchanger will be approximately 70 m x 22 m x 20 m), a single turbine ( the turbine is approximately 45 m x 25m x13m) and a 49.9MW boiler;
- 171.1 m<sup>3</sup> capacity Aboveground Storage Tanks (AST) for the storage of hazardous chemical substances and asphyxiants;
- 50 m<sup>3</sup> capacity AST for the storage of diesel during the project construction phase and 499 m<sup>3</sup> capacity AST for the storage of diesel and/or liquid petroleum gas (LPG) during the operational phase of the CSP plant (i.e. one 12 m<sup>3</sup> capacity AST is for the storage of diesel for a standby generator and one 487 m<sup>3</sup> capacity AST is for the storage of diesel and/or LPG);
- The tarred road providing access to the Concentrating Solar Thermal Plant from Transnet service road will be approximately 1000m long and 8m wide;
- 132 Kilovolts (KV) overhead power line of approximately 933 m long;
- The construction of 15km water pipeline and associated infrastructure (extending from the Orange River through the farm Sand Draai 391 and terminating at the farm Bokpoort 390);
- The construction of a 3km water pipeline and associated infrastructure on Portion 0 and 5 of Farm Sand Draai 39;
- Office block which includes board rooms, kitchen, dining facilities, first aid room and ablution facilities of approximately 12m high and 3 m<sup>2</sup> per floor;
- Temporary staff accommodation, access control building, visitors centre and shades of ports of approximately 12m high; and
- The ablution facilities, administration building, office and storeroom will be a two storey masonry structure (i.e. approximately 12 m high, 3m per floor and 3m pitch height).

## 1.3 Proposed 4MW Photovoltaic Power Plant

### 1.3.1 4MW PV Plant

The proposed PV Augmentation will be located on Block A, a portion of land previously utilised as a laydown area during the construction phase of the CSP plant as depicted by **Figure 3**. The proposed 4MW Augmentation will comprise of the following components:

- Si-poly PV modules (Jinkosolar or any other), 30 modules arranged in series with 540 strings in parallel. With a unit nominal power of 330 Wp and a total module area of 31434m<sup>2</sup>;

- The PV mounting structures will be of a fixed system including fire detection and alarm, fire protection devices firefighting water systems including jockey;
- MW Inverters (GE Power Conversion or any other) with an operating voltage of 910 – 1300 V. Sub-arrayed in Nb. Of Inverters – 3 units, with a total power of 4911 kWac;
- Area of the PV – 12 ha;
- Orientation of the PV - 20 degrees, fixed tilt at 7, 5 pitch;
- Laydown area - 3 Ha 6, 6 kV switchgear;
- The two blocks arrangement has a road with width of 4m;
- A fence surrounding the site at a height of 1,680 m; and
- An internal road that is 4.5 m wide.

### 1.3.1.1 Proposed Bokpoort PV Plant Development Phases

- For the design of the photovoltaic plant, the following equipment will be installed:
  - Nominal Power: 5 MWac (4.911 MWac at inverters) - DC/AC Ratio: 1.12.
  - PV Module: poli-crystalline 330 Wp.
  - Inverters: 3 inverters connected to LV/MV transformer.
  - PV structure: fixed structure, 20.
- Electrical works
  - LV electrical components shall be designed taking into consideration the maximum operating voltage of the solar inverter and DC equipment (1500 Vdc).
  - A 6.6 kV medium voltage level has been chosen.
  - All the MV lines will be formed by Aluminum single core conductors direct buried in MV trenches accordingly to the MV single line diagram).
- Civil works
  - An access to the PV plant will be adequate from the existing CSP PV plant.
  - A perimeter fence will be installed on the plot boundary. PV structures will be positioned at least 5 meters far from the perimeter fence.
  - Internal roads of 4 meters wide have been considered to connect Power Stations and the electrical switching station, so they can be accessed easily. The access road will be 6 meters wide.
  - The foundations of the PV structure are considered to be driving plies. It must be confirmed with the pullout tests that will be carried out by the final client.
  - DC Cable installation methods:
    - DC Cables from Strings to the combiner box will be fixed directly attached to the structure beams. As optional, it has been considered a steel suspension cable for the fixation of these cables.
    - DC AI cables from the string boxes to the inverters will be laid directly buried on LV trenches (according to the power station typical layout drawing)
    - Fixation structure considered is a fixed to ground PV structure. The structure will receive four PV modules in horizontal position (landscape). The typical design of the structure allows fixing 60 modules in each row.
    - MV Cables from Power Stations to the switching station will be laid directly buried in MV trenches according to the national normative and standards.
    - A perimeter trench for the security and earthing system has been projected.




Figure 3: Proposed location of Bokpoort PV Plant

## 1.4 Details of the Project Developer

The developer is ACWA Power Solafrika Bokpoort CSP Power Plant Pty Ltd and the details of the responsible person are listed in **Table 2** below.

Table 2: Applicant Details

Applicant	ACWA Power Solafrika Bokpoort CSP Power Plant Pty Ltd	
Representative	Ms Lusani Rathanya	 <p><b>BOKPOORT CSP</b> ACWA POWER SOLAFRIKA BOKPOORT CSP POWER PLANT (PTY) LTD (R)</p>
Physical Address	7th Floor, 90 Grayston Drive, Sandton, 2196	
Postal Address	7th Floor, 90 Grayston Drive, Sandton, 2196	
Telephone	011 722 4127	
Facsimile	011 722 4113	
E-mail	<a href="mailto:lrathanya@acwapower.com">lrathanya@acwapower.com</a>	

## 1.5 Details of the Environmental Assessment Practitioner

Royal HaskoningDHV was appointed as the Environmental Assessment Practitioner (EAP) to conduct an Environmental Assessment for the proposed project in order to identify the environmental sensitive features related to the proposed project. The contact details of the responsible person are provided in **Table 3** below.

**Table 3: Environmental Assessment Practitioner Details**

Company	Royal HaskoningDHV
Contact Persons	Ms Sibongile Gumbi
Postal Address	PO Box 867, Gallo Manor, 2052 ( Johannesburg)
Telephone	011 798 6449
E-mail	Sibongile.gumbi@rhdhv.com
Qualification	MSc Environmental Sciences
Expertise	Sibongile Gumbi has eleven years of experience in the environmental field. Her expertise ranges from Environmental Training, Environmental Auditing and Monitoring, Environmental Impact Assessment studies, Environmental Management Plans and Programmes, Stakeholder Engagement, Project Management. Sibongile is also a registered Pri.Sci.Nat.
Signature of the EAP	

## 2 ENVIRONMENTAL MANAGEMENT PROGRAMME

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### 2.1 Purpose of the Environmental Management Programme (EMPr)

In terms of The Constitution of the Republic of South Africa (1996), everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development (Section 24). The needs of the environment as well as affected parties must thus be integrated into overall project management.

The Constitution is underpinned by the suite of Specific Environmental Management Acts (SEMAs) – including the National Environmental Management Act (Act No. 107 of 1998, NEMA), National Environmental Management Waste Act (Act No. 59 of 2008, NEM:WA), National Environmental Management Air Quality Act (Act No. 39 of 2004, NEM:AQA), National Environmental Management Biodiversity Act (Act No. 10 of 2004, NEM:BA), National Environmental Management Integrated Coastal Management Act (Act No. 24 of 2008, NEM:ICMA), National Environmental Management Protected Area Act (Act No. 57 of 2003, NEM:PAA), as well as the National Water Act (Act No. 36 of 1998, NWA) – which combined, serve to control all relevant facets of the environment so as to ensure that Section 24 of the Constitution is ensured.

The EMPr is developed in terms of the SEMAs and ensures that construction activities meet the requirements of existing environmental legislation and good environmental practice in terms of local and international standards and guidelines. This is achieved by identifying those construction activities for the proposed development that may have a negative impact on the environment; outlining the mitigation measures that will need to be taken and the steps necessary for their implementation and describing the reporting system to be undertaken during construction.

It is noted that protection of the environment is enshrined in the Duty of Care requirement of the NEMA (as amended), which thus means that it is the duty of all landowners and users to ensure that the activities they carry out on a site do not cause detriment to the environmental facets thereof. The EMPr thus functions as a programme which can be monitored and audited that will allow the Developer the ability to ensure that all that operate on the site do so in an environmentally safe manner. It is also structured in such a way that the conditions may be linked to a standard construction contract. It is essential that the EMPr requirements be carefully studied, understood, implemented, and adhered to at all time. Each action within the EMPr is supported by the priority of when the specific action will need to be implemented.

Core to the purpose of the EMPr is to implement the ‘mitigation hierarchy’ (DEA *et al.*, 2013), which is illustrated in **Figure 4**:



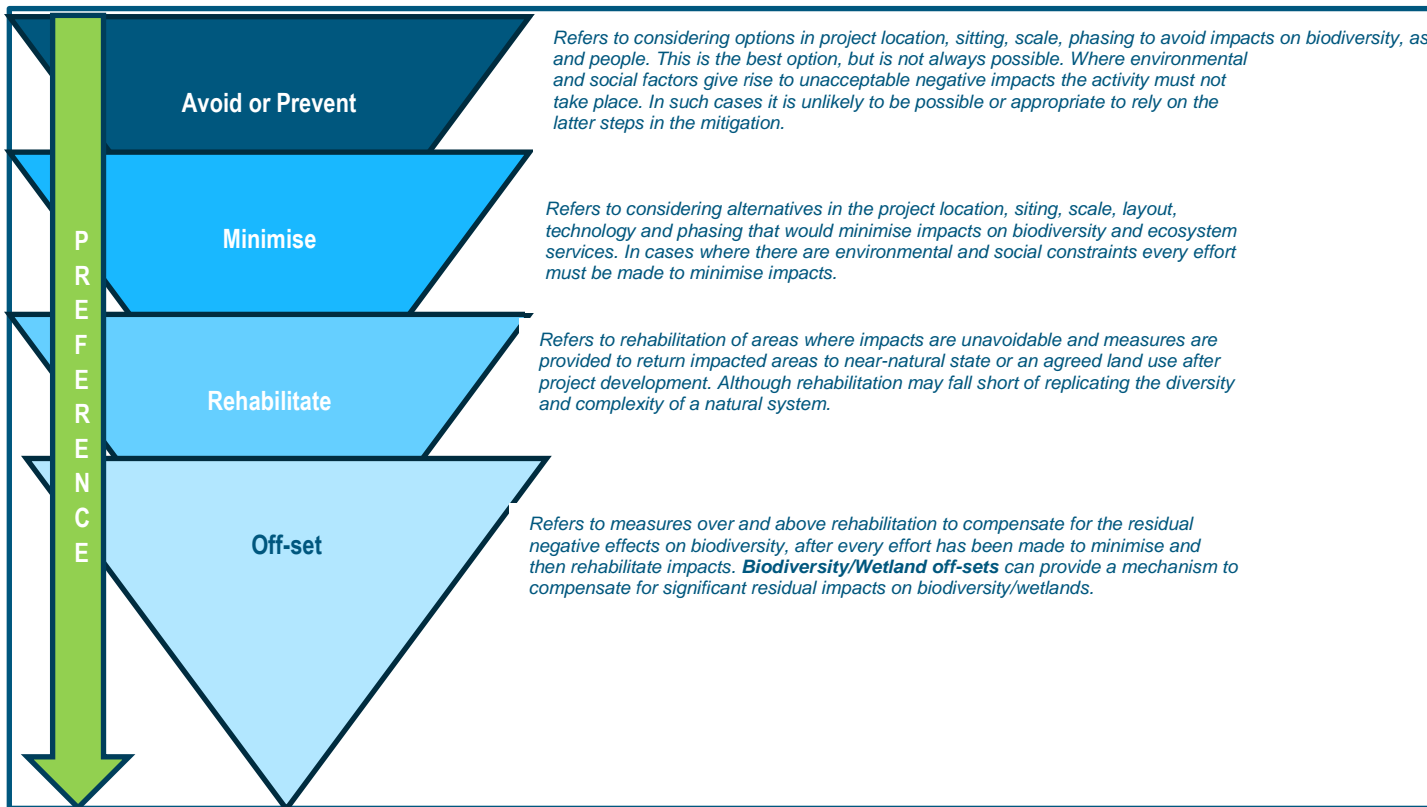


Figure 4: Mitigation Hierarchy

## 2.2 Objectives of the EMPr

The EMPr has the following objectives:

- To ensure compliance with regulatory authority stipulations and guidelines; which may be local, provincial, national, and / or, international.
- To outline functions and responsibilities of responsible persons.
- To state standards and guidelines, which are required to be achieved / complied with in terms of environmental legislation.
- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the proposed project.
- To identify measures that could optimise beneficial impacts.
- To prevent long-term or permanent environmental degradation.
- To establish a method of monitoring and auditing environmental management practices during all phases of development.
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- Ensure that the safety recommendations are complied with.
- Propose mechanisms for monitoring compliance with the EMPr and reporting thereon.

- Specify time periods within which the measures contemplated in the EMPr must be implemented, where appropriate.
- To provide an environmental awareness plan.
- Provide rational and practical environmental conditions / requirements to:
  - Minimise disturbance of the natural environment;
  - Ensure water resource protection;
  - Prevent or minimise all forms of pollution;
  - Protect indigenous flora and fauna;
  - Prevent soil and sand erosion and facilitate the re-vegetation of affected areas;
  - Maintenance of newly re-vegetated areas;
  - Restrict noise disturbance;
  - Ensure compliance with all applicable laws, regulations, standards and guidelines for the protection of the environment;
  - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
  - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste; and
  - Train the Developer, their employees and contractors (including all sub-contractors) with regard to their environmental obligations.

The EMPr is essentially, a written programme of how the environment is to be managed in practical and achievable terms.

An independent Environmental Control Officer (ECO) must be appointed by the Developer (i.e. ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF)), to ensure compliance with the EMPr.

### **2.3 Scope of the EMPr**

In accordance with the requirements of the NEMA, this EMPr must be implemented by the Developer as well as any employee, contractor, agent, or sub-contractor appointed to act on behalf of the Developer in the execution of the project, in order to ensure environmental compliance on site.

The specifications outlined in this EMPr are thus applicable to all activities undertaken by the Developer as well as their appointed contractors and all persons involved in the execution of the works, including sub-contractors, the workforce, suppliers, and volunteers, for the duration of construction, operation and future maintenance.

Included within the EMPr is guidance for on-going training with respect to the implementation of the conditions included therein, including induction by all new people coming onto site to carry out work, and 'top-up' activities such as regular 'toolbox talks' on specific key issues.

An Environmental Code of Conduct has also been developed that provides a simplified set of rules that must be adhered to by all persons involved with the project at all times. This is to be displayed at strategic points to ensure constant environmental awareness.

The effectiveness of the EMPr is limited by the level of adherence to the conditions set forth in the EMPr by the Developer, the Contractor and Sub-contractors. It is further assumed that compliance with the EMPr will be monitored and audited as set out in this EMPr and contractual clauses.

*This amended Environmental Management Programme incorporates all the recommendations made to date for the project and including the proposed 4MW PV Augmentation plant. Specialists who were previously involved in the CSP Plant project were requested to revise their reports in order to identify potential environmental impacts and recommend mitigation measures where required. In summary, no significant impacts were identified in association with the proposed PV Augmentation plant; therefore minor changes have been made to the Environmental Management Programme (previously referred to as “Environmental Management Plan”). Most of the specialist’s studies undertaken for the proposed project recommended that the mitigation measures which were recommended previously and contained in the approved EMP be implemented for the project. It must be noted though that the avifaunal study recommended further mitigation measures which are contained in the “biodiversity” section and these have been underlined for easy identification.*

## 2.4 Structure of the EMPr

The EMPr is separated into four phases. Each phase has specific issues unique to the period of the development and operation of the proposed CSP and PV Augmentation plant and associated infrastructure. The impact is identified and given a brief description. The four phases of the development are identified as below:

- Pre-Construction Phase.
- Construction Phase and associated rehabilitation of affected environment.
- Operational Phase (Post-Construction).
- Closure and Decommissioning.

After analysing the criteria such as extent, duration, intensity, etc. under each phase, a discussion is presented where appropriate. The Environmental Management Programme is then shown and the mitigation measures in each development phase identified.

## 2.5 The EMPr as a “Live” Document

The approach adopted for this EMPr is derived from the Deming Cycle (**Figure 5**) a cycle of continuous improvement that entails the reiterative actions of plan, do, check, act, and critically to then return to the planning phase.

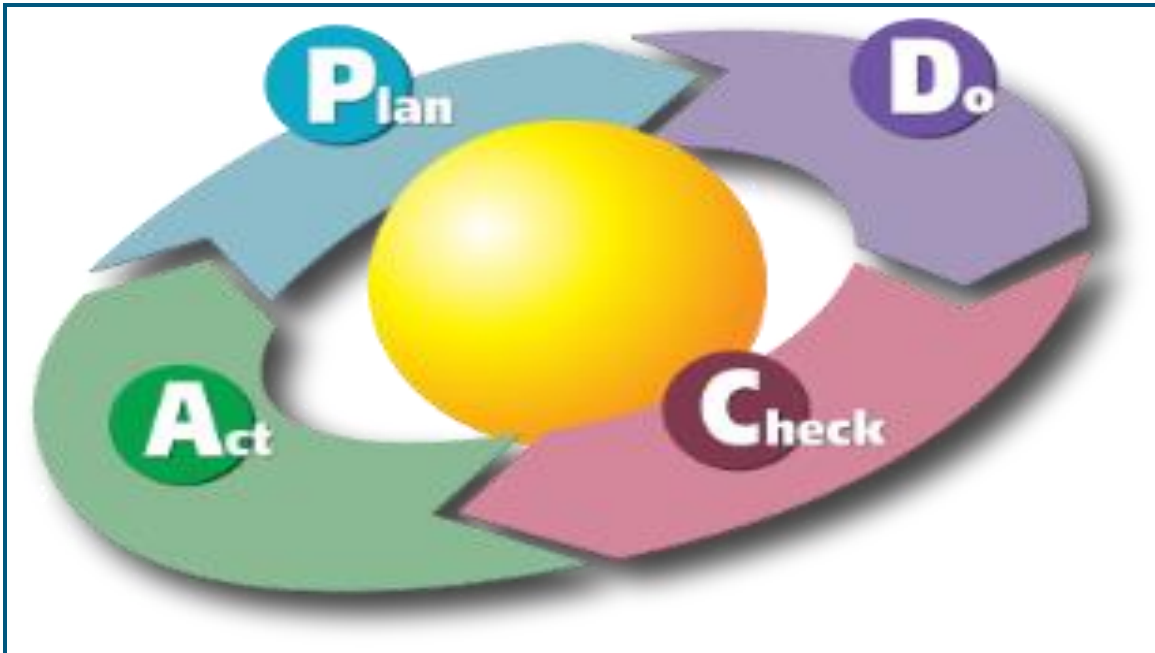


Figure 5: Deming Cycle of Continuous Improvement

### 2.5.1 Plan

Project-specific planning for the proposed project involves consideration of the legal triggers, the specifics of the proposed development, and the nature of the receiving environment. This provides a starting point for targeted environmental management objectives.

Environmental performance indicators are then determined with measurable targets prescribed to monitor the environmental performance of the project. Achieving the targets depends on compliance with this EMPr and the legislative requirements that underpin it.

### 2.5.2 Do

Throughout the development's life-span, the Developer must develop and maintain a Quality Management System (QMS) – designed to ensure that best management practices are implemented in day-to-day management. Such a QMS must at least include the following information:

- Location and extent of associated infrastructure;
- Associated activities, such as the transportation of people and equipment;
- Resources and experience required (staffing);
- Materials and equipment to be used;
- Management actions;
- Human resources used;
- Construction-monitoring activities;
- Emergency / disaster incident and reaction procedures; and
- Rehabilitation procedures for the impacted environment.

These topics must be cross-linked into the contracts related to the development of the project.

### **2.5.3 Check**

A system of assessing monitoring results has been developed to check the environmental management performance. Continuous assessment facilitates proactive management of the environmental issues. Mitigation measures can then be successfully implemented on an on-going basis to keep environmental indicators within their target thresholds. Moreover, the assessment system also enables the assessment of the efficacy of the EMPr. Regular auditing of environmental performance is prescribed to prove and preserve accountability.

### **2.5.4 Act**

The assessments and monitoring of the results and findings of the regular audits must be documented within a reporting system. Precautionary mitigation measures and corrective actions must be prescribed and instructions must be given in order to implement these in the field. The findings of monitoring and auditing programmes can also be used to update the EMPr. Although the EMPr is a project-specific document, it is dynamic and must be updated regularly to address the changing circumstances of the project.

### 3 SITE DESCRIPTION

#### 3.1 Site Description and Ownership

The proposed activity is situated within a portion of the Remainder of the Farm Bokpoort 390, located within the !Kheis Local Municipality jurisdictional boundary, approximately 15 km north of the town of Groblershoop. The proposed 4MW PV plant will be located in Block A of the existing operational CSP Plant. The land is shared owned by private owners tabulated in **Table 4** below.

*Table 4: Cadastral Information of the Affected Property*

21 Digit Reference Number	Erf and Portion Number	Owner (s)
U0000000004003900000	Remainder of the Farm Bokpoort 390	ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF)

#### 3.2 Co-ordinates

##### 3.2.1 Bokpoort CSP Plant

*Table 5: Existing Operational Bokpoort CSP Plant Co-ordinates*

	Latitude	Longitude
Bokpoort CSP Plant	28°43'26.96"S	21°59'34.88"E

##### 3.2.2 Bokpoort PV Plant

*Table 6: Proposed Bokpoort PV Plant*

	Latitude	Longitude
Bokpoort PV Plant	28°43'26.96"S	21°59'34.88"E

##### 3.2.3 Water Abstraction

An application for Environmental authorisation was applied for through the Basic Assessment process for the construction of the water pipeline following the refinement of the design that resulted in the re-alignment of the previously authorised pipeline as well as the substitution of storage tanks with storage/regulation ponds in line with the industry standard design for bulk raw water storage in CSP plants worldwide. The application focused on the following activities;

- the water pipeline (extending from the Orange River through the farm Sand Draai 391 and terminating at the farm Bokpoort 390),
- a pump station on the farm Sand Draai 391 (portions 0 and 5); and
- storage ponds as well as associated infrastructure on the approved CSP site on portion 0 of the farm Bokpoort 390

On the **08th March 2013** the Department of Environmental Affairs authorised the applicant for the construction of a 15 km pipeline and associated infrastructure from Portions 0 and 5 of Farm 391 farm Sand Draai to Portions 0 of Farm No 390 , Farm Bokpoort, near Upington, Northern Cape Province (DE Ref No: DEA/EIA/0001265/2012).

### ***3.2.4 Construction Camp***

The proposed construction of the 4MW PV Plant will not utilise a new construction camp. The construction camp currently utilised by the Bokpoort CSP Plant will be utilised. A 3ha laydown area is proposed for the proposed construction.

### ***3.2.5 Stormwater Management***

Stormwater will be collected on-site by a storm water drainage system and temporarily stored in a storm water detention basin before being discharged to the main drainage system. Drainage shall be collected at the lowest point (altitude) of the site.

### ***3.2.6 Security***

A security fence will be erected along the perimeter of the site with a service road along and perimeter security lighting on the inside of the Bokpoort CSP Plant.

## 4 LEGAL FRAMEWORK

### 4.1 EIA Regulations (2014 as amended in 2017)

#### 4.1.1 EIA Regulations (2014 as amended in 2017)

The potential environmental impacts associated with this proposed project are required to be considered in compliance with (EIA) Regulations (2014 as amended in 2017) made under Section 24(5) of the National Environmental Management Act (Act No. 107 of 1998) (as amended).

### 4.2 National Water Act (Act No. 36 of 1998)

As the proposed development crosses various watercourses, a Water Use Authorisation is required in terms of Section 21 (a) of the National Water Act (Act No. 36 of 1998):

- **Section 21 (a)** – abstraction of water from a watercourse.

### 4.3 Other Relevant Legislation / Policies / Guidelines

Table 7: Legislative Requirements<sup>1</sup>

Legislation	Sections	Relates to
The Constitution (No. 108 of 1996)	Chapter 2	Bill of Rights.
	Section 24	Environmental rights.
National Environmental Management Act (Act No. 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment.
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	The Developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
EIA Regulations (2014 as amended in 2017)	GNR327	Activities requiring a Basic Assessment study to be undertaken.
	GNR325	Activities requiring a Scoping and Impact Assessment study to be undertaken.
	GNR324	Activities in special geographical areas requiring a Basic Assessment study to be undertaken.
National Forests Act (Act No. 84 of 1998) and Regulations	Section 7	No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under section 7(4) or section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette.

<sup>1</sup> It is noted that the legal framework provided in this document relates to the most recent legislation at the time of compiling this document. It is noted that legislation changes continuously and it is the Developer's responsibility to ensure that they are compliant with the most relevant legislation at any given time.



Legislation	Sections	Relates to
National Environmental Management: Biodiversity Act (Act No. 10 of 2004) Threatened or protected species (GN 388) Lists of species that are threatened or protected (GN 389) Alien and invasive species regulations (GNR 506) Publication of exempted alien species (GNR 509) Publication of National list of invasive species (GNR 507) Publication of prohibited alien species (GNR 508)		Provide for the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.
	Section 53	Protection of threatened or protected ecosystems.
	Section 65	Control of alien species.
	Section 71	Control of invasive species.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003) – NEM: PAA		Creates a legal framework and management system for all protected areas in South Africa as well as establishing the South African National Parks (SANParks) as a statutory board. Each conservation area will have its own set of land use restrictions or regulations that stem either from generic restrictions under NEM: PAA, or customized regulations for individual protected areas.
National Waste Act (Act No. 59 of 2008) and List of Waste Activities (November 2013)		Provides for specific waste management measures and the remediation of contaminated land.
Norms and Standards for the Storage of Waste, 2013	GNR 926 – Sections 7 – 20	Provides specific guidelines for the operational procedures for a facility for the storage of waste.
National Heritage Resources Act (Act No. 25 of 1999) and regulations	Section 34	No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.
	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
	Section 38	This section provides for Heritage Impact Assessments (HIAs), not already covered under the environmental law. Where covered under such law the

Legislation	Sections	Relates to
		provincial heritage resources authorities must be notified of a proposed project and must be consulted during the HIA process. The HIA is thus approved under the environmental authorisation, which must take into account the provincial heritage resources authorities' comments prior to making a decision on the HIA.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Section 34	Control of noise.
	Section 35	Control of offensive odours.
National Dust Control Regulations (GNR 827 of November 2013)		Control of dust.
Occupational Health and Safety Act (Act No. 85 of 1993)	Section 8	General duties of employers to their employees.
	Section 9	General duties of employers and self-employed persons to persons other than their employees.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	Section 22 / 27	Application for a mining right / permit.
	Section 39	Environmental management programme and environmental management plan.
Hazardous Substances Act (Act No. 15 of 1973) and regulations		Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.
National Road Traffic Act (Act No. 93 of 1996)		Road safety.
SANS 10103 (Noise Regulations)		The measurement and rating of environmental noise with respect to annoyance and to speech communication.
<b>Municipal By-laws:</b>		
Siyanda District Municipality IDP Review (2013-2014)		
!Kheis Local Municipality IDP – (2016-2017)		

#### 4.4 Applicable Documentation

The following environmental documentation is applicable for the project, and must be read in conjunction with this EMPr:

- Environmental Authorisation dated 14 June 2011;
- Environmental Authorisation dated 08 March 2013;
- Environmental Authorisation dated 24 November 2014;
- Amended Environmental Authorisation dated 22 September 2011;
- Amended Environmental Authorisation dated 10 July 2012;
- Amended Environmental Authorisation dated 28 March 2013;
- Final Environmental Scoping Report – “Environmental Impact Assessment Study For A Proposed Concentrating Solar Thermal Power Plant In The Siyanda District, Northern Cape”;
- Final Environmental Impact Report - “Environmental Impact Assessment Study For A Proposed Concentrating Solar Thermal Power Plant In The Siyanda District, Northern Cape”;
- Final Environmental Management Plan;



- Water Use Authorisation for the abstraction of water;
- DAFF licence to remove protected tree species – *once issued following renewal*; and
- Final Environmental Assessment for the proposed 4MW PV Plant.

## 5 ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMPr is to ensure that all the workforce, contractors, sub-contractors and construction staff have an understanding of environmental issues and potential impacts on-site activities. This environmental code of conduct provides the basic rules that must be strictly adhered to.

It is the responsibility of the Site Environmental Officer, the Environmental Officer and ECO (as appointed) to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

**All persons are obliged to keep to the rules of this Code of Conduct**

**Ignorance, negligence, recklessness or a general lack of commitment resulting in environmental degradation or pollution must not be tolerated!**

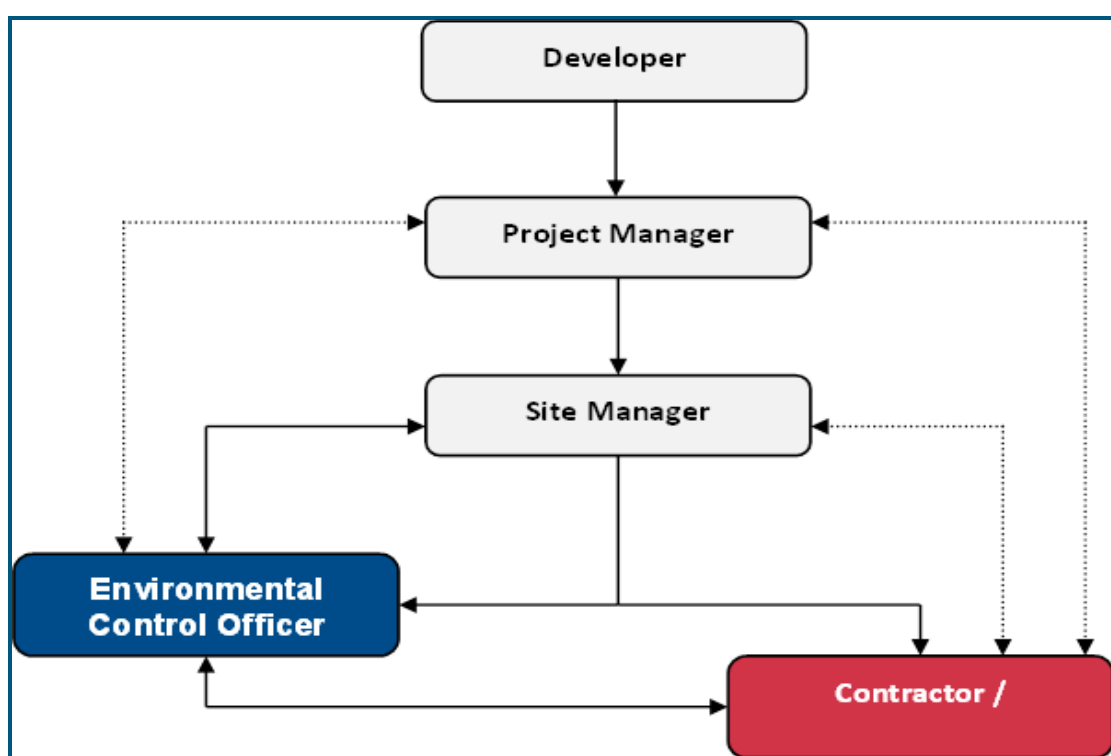
### **Environmental Rules**

- Do not waste electricity, water or consumables;
- Only use authorised accesses;
- Do not litter;
- Dispose solid waste to the correct waste containers provided;
- Prevent pollution;
- Use the toilet facilities provided;
- Do not dispose contaminated wastewater to the stormwater or the environment;
- Immediately report any spillage from containers, plant or vehicles;
- Do not burn or bury any waste in the sand;
- Do not trespass onto private properties;
- Strictly leave all animals alone. Never tease, catch or set devices to trap or kill any animal;
- Never damage or remove any trees, shrubs or branches unless it forms part of working instructions;
- Do not deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area;
- Know the firefighting procedure and locations of firefighting equipment; and
- Know the environmental incident procedures.

## 6 MANAGEMENT AND MONITORING PROCEDURES

### 6.1 Organisational Structure and Responsibilities

ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd is the Developer for the Project. It is noted that the developer and their respective professional project teams, are responsible for the construction of the Bokpoort CSP and PV Plant. **Figure 6** below provides an indication of the organisational and team structure for the project.



**Figure 6: Project Team Organisational Structure**

Each of the team roles are elaborated on in terms of their specific duties hereafter. The following outlines the defined and specific roles and responsibilities of each team member: Additional roles not depicted by the image above are detailed below as deemed necessary for the project.

**Table 8: Roles and Responsibilities**

ROLES AND RESPONSIBILITIES
DEVELOPER
The Developer is ultimately responsible for ensuring compliance with the environmental specification and upholding ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd environmental commitment to 100% compliance with all National, Provincial and local legislation that relates to management of the environment. The Developer must: <ul style="list-style-type: none"> <li>▪ Appoint a Project Manager (PM) to assume ultimate project responsibility;</li> <li>▪ Be familiar with the contents of the EMPr;</li> </ul>

### ROLES AND RESPONSIBILITIES

- Ensure the EMPr is in the tender documentation issues to prospective Contractors;
- Request for, review and approve the method statements prepared by the Contractor;
- Review and comment on environmental assessments and / or reports produced by the Contractor and ECO;
- Undertake regular site visits and ensure environmental specifications are implemented;
- Discuss with the ECO the application of penalties for the infringement of the Environmental Specifications, another possible enforcement measures necessary;
- Issue penalties as and when necessary;
- Arrange information meetings for or consults with I&APs about the impending construction activities;
- May on the recommendation of the PM and / or SHE Officer order the Contractor to suspend any or all works on-site if the Contractor or his sub-contractor / supplier fails to comply with the said specifications;
- Maintain a register of complaints and queries by members of the public at the site office; and
- Ensure the EMPr is implemented as well as revised and updated as and when required.

### ENVIRONMENTAL LIAISON OFFICER

The Environmental Liaison Officer must:

- Monitor activities on site on a daily basis.
- The ELO will be the ECO's representative on the site and will report back on all audit trips.
- Report any major incidents immediately to the ECO.

### CONTRACTOR (INCLUDING SUB-CONTRACTORS)

The Contractor must:

- Be fully conversant with the EMPr;
- Implement, manage and maintain the EMPr for the duration of the contract;
- Appoint a suitably qualified SHE Officer whose responsibility includes on-going monitoring and control of all construction activities concerning minimisation of environmental impact and adherence to the EMPr for the duration of the project;
- Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the Contract Document.
- Supply method statements timeously for all activities requiring special attention as specified and / or requested by the Developer, SHE Officer and / or PM during the duration of the Contract.
- Comply with requirements of the EMPr and any subsequent revisions in terms of this specification and the project specification, as applicable, within the time period specified.
- Ensure any sub-contractors / suppliers who are utilised within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The Contractor must be held responsible for non-compliance on their behalf;
- Provide appropriate resources - budgets, equipment, personnel and training - for the effective control and management of the environmental risks associated with the construction of the development;
- Bear the cost of any delays, with no extension of time granted, must he / she or his / her sub-contractors / suppliers contravene the said specifications such that the PM orders a suspension of work. The suspension must be enforced until such time as the offending party(ies), procedure, or equipment is corrected;
- Bear the costs of any damages / compensation resulting from non-adherence to the said specifications or written site instructions;
- Review ECO reports and take cognisance of the information / recommendations contained therein;
- Comply with all applicable legislation;
- Ensure that he / she informs the PM timeously of any foreseeable activities which will require input from the SHE Officer;
- Notify the ECO and PM, verbally and in writing at least 10 working days in advance of any activity he / she has reason to believe may have significant adverse environmental impacts, so that mitigatory measures may be implemented timeously;
- Ensure environmental awareness among his / her employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them;
- Maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract; and
- Communicate and liaise frequently and promptly with the ECO and the PM to ensure effective, proactive environmental management with the overall objective of preventing or reducing negative environmental impacts while enhancing positive

### ROLES AND RESPONSIBILITIES

environmental impacts.

The Contractor must conduct all activities in a manner that minimises disturbance to the natural environment as well as directly affected residents and the public in general. The primary Contractor assumes responsibility and accountability of all appointed sub-contractors and must ensure their compliance with this EMPr.

### ENVIRONMENTAL CONTROL OFFICER

The ECO must:

- Be familiar with the recommendations and mitigation measures of the associated EMPr for the project;
- Monitor the implementation of the EMPr during the pre-construction, maintenance and rehabilitation phases;
- Ensure site protection measures are implemented on-site;
- Monitor that the Principal Contractor, sub-contractors, construction teams and the Developer are in compliance with the EMPr at all times during the pre-construction, maintenance and rehabilitation phases of the project;
- Monitor all site activities monthly for compliance;
- Conduct monthly audits of the site according to the EMPr, and report findings to the Developer / Contractor;
- Attend monthly site meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions; and
- Conduct once-off training with the Contractor on the EMPr and general environmental awareness.

***It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of the Developer, Contractor and the SHE Officer.***

### SAFETY, HEALTH AND ENVIRONMENTAL (SHE) OFFICER

The Safety, Health and Environmental Officer must:

- Be fully conversant with the EMPr;
- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of method statements together with the Principal Contractor that will specify how potential environmental impacts in line with the requirements of the EMPr must be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMPr are achieved;
- Convey the contents of this EMPr to the construction-site staff and discuss the contents in detail with the Contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and / or equipment in contravention of the specifications of the EMPr;
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMPr;
- Submitting a report at each site meeting which must document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions issued by the ECO is available on request; and
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction.

## 6.2 Monitoring

A monitoring programme will be implemented for the duration of the construction phase of the project. This programme will include:

- Monthly audits will be conducted by the Environmental Control Officer for the duration of the construction phase (approximately 24 months for the CSP) and 7 months for the PV Augmentation. These audits can be conducted randomly and do not require prior arrangement with the Project Manager.
- Compilation of an audit report with a rating of the compliance with the amended EMPr. This report will be submitted to the relevant environmental authorities (DEA / NC DENC). The ECO must keep a photographic record of any damage to areas outside the demarcated site area. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage should be directed to the ECO for appraisal. The Contractor shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from the Landowners and / or the Local Community. All complaints / claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.

*It should be noted that it is difficult to outline a formal monitoring protocol for specific environmental parameters and key impacts until such time as the detailed CSP plant design and final alignment for the water pipeline and 132kV overhead power line have been completed. A formal monitoring protocol will be included within the revised EMPr once the detailed CSP plant design and final alignments for the water pipeline and overhead power line have been completed, and once recommendations and conditions from the decision-making authority (DEA) have been received. In addition the requirements of the Department of Water and Sanitation (DWS) in terms of the Water Use Licensing Application Process under the National Water Act (Act 36 of 1998) have been finalised. The monitoring protocol requirements imposed by the DWA have been included in the EMPr granted to ACWA Power SolAfrica Bokpoort CSP Plant (Pty) Ltd (RF).*

### 6.3 Responsible Parties and Auditing Process

The table below details the proposed auditing process and responsible parties as indicated in detail in **Section 8** below.

**Table 9: Responsible Parties and Proposed Auditing Process**

Title	Party	Role During Construction	Role During Operation	Abbreviation
Developer	<u>ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF)</u>	Assume ultimate responsibility	Assume ultimate responsibility	DEV
Project Manager	TBA	Project management	Project management	PM
Landscape Architect Ecologist	/TBA	Monitoring of vegetation translocation and planting	Possibly Maintenance of landscaping	LA
Main Contractor	TBA	Main Contractor	N/A	MC
Environmental	To be appointed by Main	Day to day environmental	N/A	ELO



Title	Party	Role During Construction	Role During Operation	Abbreviation
Liaison Officer	Contractor	responsibility, point of contact for ECO		
Environmental Health and Safety	To be appointed by Main Contractor	Day to day health and safety responsibility	N/A	SHE
Environmental Control Officer	To be appointed by <u>ACWA Power SolAfrica Bokpoort CSP Power Plant (Pty) Ltd (RF)</u>	Monthly audits	Annual audits	ECO
Local / District Authority	IKheis Local Municipality ZF Mgcawu District Municipality	Conduct site visits if and when necessary	Conduct site visits if and when necessary	
National Provincial Authority	Department of Environmental Affairs Northern Cape Department of Environment and Nature Conservation Department of Water and Sanitation	Conduct site visits if and when necessary	Conduct site visits if and when necessary	DEA NC DENC DWS

## 6.4 Environmental Management Responsibilities

The following are the environmental management responsibilities of the various parties during construction and operational phases. Unless otherwise stated the EMPr will be adhered to as follows:

- The ELO will be the responsible party for all compliance of this EMPr during the construction phase.
- The monitoring party will be the ECO.
- Method of record keeping will be weekly to two weekly audits depending on the stage of the project.
- Audit technique to be undertaken will either be:
  - The review of records that will be kept on site by the ELO and / or
  - A site inspection.
- The Developer will bear ultimate responsibility.

**Table 10: Environmental Management Responsibilities**

Item	Project Component and Activity	Responsible Party	Monitoring Party	Audit Technique
<b>1</b>	<b>Pre-construction Activities</b>			
1.1	Appoint construction team and suitable manager	DEV	DEV	
1.2	Training of site staff	DEV, MC	DEV	
1.3	Confirm suitable sites for Construction Camp & Storage	MC, ECO	ELO, ECO	

<b>2.1</b>	<b>Construction Activities</b>			
2.1.1	Construction Zone	MC	ECO	Site Visit
2.1.2	Construction Camp	MC,ELO,ECO	ECO	Site Visit
2.1.3	Storage Areas	ELO	ECO	Site Visit
2.1.4	Stock Pile Areas	ELO	ECO	Site Visit
2.1.5	Geotechnical Issues for Consideration	ELO	ENGINEER	Site Visit
2.1.6	Surface run-off	MC	ELO, ECO	Site Visit
2.1.7	Disruption of Infrastructure & Services	ENGINEER	ECO	Site Visit
2.1.8	Supervision	MC, ELO	ECO	Site Visit
<b>2.2</b>	<b>Physical Environment</b>			
2.2.1	Construction Traffic and Access	MC, ELO	ECO	Site Visit
2.2.2	Noise	ELO	ECO	Records Review
2.2.3	Soils and Geology	MC, ELO	ECO	Site Visit
2.2.4	Groundwater and surface water pollution	ELO	ECO	Records Review
2.2.5	Hydrology and Storm water	ELO	ENGINEER	Site Visit
2.2.6	Air pollution	ELO	ECO	Records Review
2.2.7	Flora	ELO	ECO, Ecologist (when necessary)	Site Visit
2.2.8	Fauna	ELO	ECO, Ecologist (when necessary)	Records Review & Site Visit
<b>2.3</b>	<b>Socio-Economic Environment</b>			
2.3.1	Employment	DEV, MC	ECO	Records Review
2.3.2	Injury to Workers and Public	MC, ELO	Safety Officer, ECO	Records Review
2.3.3	Security	MC, ELO	ECO	Site Visit
<b>2.4</b>	<b>Visual Environment</b>			
2.4.1	Upkeep of visual environment	ELO, LA	ECO	Site Visit

<b>2.5</b>	<b>Cultural Environment</b>			
2.5.1	Archaeology	ELO	ECO	Records Review
<b>3</b>	<b>Post Construction Operational Activities</b>			
3.1	Land Use Rehabilitation	LA, ELO	DEV, ECO	Site Visit
3.2	Replacement of topsoil	DEV, ELO	DEV, ECO	Site Visit
3.3	Re-vegetation	LA, ELO	DEV, ECO	Site Visit
3.4	Surface Water	DEV, ELO	DEV, ECO	Site Visit
3.5	Site and Public Safety	DEV, ELO	DEV, ECO	Site Visit
3.6	Pollution Control	DEV, ELO	DEV, ECO	Site Visit

## 6.5 Reporting Procedures

### 6.5.1 Documentation

The following documentation must be kept on site in order to record compliance with the EMPr:

- An Environmental File which includes:
  - Copy of the original EA
  - Copy of the amended EAs
  - Copy of the EMP;
  - Copy of the Amended EMPr
  - All specialist studies undertaken during the Environmental Impact Assessment Process;
  - All relevant permits, licences, for example; WUL, DAFF Licence, etc.;
  - Copy of relevant legislation;
  - Environmental Policy of the main Contractor;
  - Environmental Method Statements compiled by the Contractor;
  - Non-conformance Reports;
  - Environmental register, which shall include:
    - Communications Register – including records of Complaints, and, minutes and attendance registers of all environmental meetings;
    - Monitoring Results – including environmental monitoring reports, register of audits, non-conformance reports; and
    - Incident Book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record.
  - Waste Documentation such as, but not necessarily limited to: Waste Manifest Documents, Safe Disposal Certificates (SDCs) and Sewerage Disposal Receipts;
  - Material Safety Data Sheets (MSDSs) for all hazardous substances;
  - Dust suppression register;

- Written Corrective Action Instructions; and
- Notification of Emergencies and Incidents.

### **6.5.2 Environmental Register**

The Developer must put in place an Environmental Register. The Contractor and Environmental Liaison Officer must ensure that the following information is recorded for all complaints / incidents:

- Nature of complaint / incident.
- Causes of complaint / incident.
- Party / parties responsible for causing complaint / incident.
- Immediate actions undertaken to stop / reduce / contain the causes of the complaint / incident.
- Additional corrective or remedial action taken and / or to be taken to address and to prevent reoccurrence of the complaint / incident.
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions.
- Procedures to be undertaken and / or penalties to be applied if corrective or remedial actions are not implemented.
- Copies of all correspondence received regarding complaints / incidents.

The above records must form an integral part of the Contractor's records. These records must be kept with the EMPr, and must be made available for scrutiny if so requested by the Developer.

### **6.5.3 Non-Conformance Report**

A Non-Conformance Report (NCR) must be issued to the Contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This must be issued by the ECO to the Contractor in writing. Preceding the issuing of an NCR, the Contractor must be given an opportunity to rectify the issue. Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it must be reported to the relevant authorities and immediately escalated to the level of a NCR. The following information must be recorded in the NCR:

- Details of non-conformance;
- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects;
- Nature of the risk;
- Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and must take the hierarchy of controls into account;
- Agreed timeframe by which the actions documented in the NCR must be carried out; and
- ECO must verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and Contractor must sign the Close-Out portion of the Non-Conformance Form and file it with the contract documentation.

### **6.5.4 Environmental Emergency Response**

The Contractor's environmental emergency procedures must ensure appropriate responses to unexpected / accidental actions / incidents that could cause environmental impacts. Such incidents may include:

- Accidental discharges to water (i.e. into the watercourse) and land;
- Accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- Accidental damage to existing utilities e.g. sewer and water pipelines;
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

The Environmental Emergency Response Plan is separate to the Health and Safety Plan as it is aimed at responding specifically to environmental incidents and must ensure and include the following:

- Construction employees must be adequately trained in terms of incidents and emergency situations;
- Details of the organisation (i.e. manpower) and responsibilities, accountability and liability of personnel;
- A list of key personnel and contact numbers;
- Details of emergency services (e.g. the fire department / on-site fire detail, spill clean-up services) must be listed;
- Internal and external communication plans, including prescribed reporting procedures;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures to be implemented; and
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.

The Contractor and their sub-contractor(s) must comply with the environmental emergency preparedness and incident and accident-reporting requirements as per the relevant legal requirements.

#### **6.5.5 Public Communication and Liaison with I&APs**

The Developer must ensure that the adjacent landowners are informed and updated throughout the construction phases. Sufficient signage must be erected around the site (including at the entrance), informing the public of the construction activities taking place. The signboards must include the following information:

- The name of the Contractor; and
- The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.

### **6.6 Contractor Performance**

The Contractor must ensure that the conditions of the EMPr are adhered to. Should the Contractor require clarity on any aspect of the EMPr the Contractor must contact the ECO for advice pertaining to that specific aspect.

## 7 ENVIRONMENTAL AWARENESS PLAN

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The Developer is committed to promoting and implementing sustainability throughout their operations. As part of this commitment, the Developer recognises the importance of making all employees aware of the potential environmental impacts that could result from conducting their jobs and how this potential can be minimised through effective training. Environmental awareness to the employees of the project must be provided by implementing environmental awareness training in the following forums:

- Toolbox Talks (Weekly);
- Environmental Awareness Courses (Ad hoc); and
- EMPr Awareness (as and when required).

The above mentioned awareness activities must be used to share information and to ensure that all personnel are aware of the environment in which they operate and what environmental aspects require attention during their daily operations / activities / tasks. Additionally, personnel awareness training must be undertaken if and when required to strengthen the personnel's understanding of environmental issues.

The method and medium of communication during the environmental meetings must be determined by the SHE Officer facilitating the meetings. The topics discussed in meetings must be recorded, with all employees present signing an attendance register. As potential environmental impacts differ in each department of the operation, the environmental topics selected for discussion can either be:

- General topics that are applicable to the entire activity;
- Area specific topics as identified in the impacts on the receiving environment; and
- Topics that can be "taken home" and implemented off-site.

### 7.1 General Topics

There are a number of environmental impacts resulting from the proposed project. General topics include, but are not limited to, the following:

- Water consumption and conservation;
- Dust generation related impacts (including health-related) ;
- Noise generation and related impact (including health-related);
- Domestic waste minimisation and recycling;
- Practical training regarding the clean-up of major and minor hydrocarbon spills / use of spill management kit;
- Practical training on using a fire extinguisher;
- Social awareness and HIV / AIDS education;
- Alien vegetation identification and removal, and the importance of indigenous vegetation; and
- Employees must undergo training for the operation and maintenance activities associated with a Concentrating Solar Power (CSP) and PV Augmentation Plant and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.

## 7.2 Activity Specific Topics

Some activities have environmental impacts that are unique to each area. These must be addressed in the SHEQ meetings. Area specific topics include and some of these topics must be a repeat of those covered under general topics:

- Protection of water resources;
- Stormwater management;
- Vehicle emissions and related impacts (including health related);
- Practical training regarding the clean-up of major and minor hydrocarbon spills;
- The importance of the waste management system and implementing good housekeeping;
- Dust generation and why and how to reduce dust; and
- Biodiversity interaction awareness.

## 7.3 Take-home Topics

Environmental awareness must not stop at the work place. Many of the concepts learned at work can be applied to employees' life style at home. Topics that can be covered under "take home topics" include, but are not limited to:

- Water consumption and conservation, and;
- Domestic waste minimisation and recycling - "Reduce, Reuse and Recycle.

## 7.4 Training of Construction Workers

Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Where training has been done verbally, persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr.

The Construction Workers must receive basic training in environmental management, including the storage and handling of hazardous substances, minimisation of disturbance to sensitive areas, management of waste, and prevention of water pollution. They must also be appraised of the EMPr's requirements.

## 8 IMPLEMENTATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

### 8.1 Pre-Construction Phase

Requirements for the pre-construction phase:

- Proper timeous and continuous liaison between the developer, the Contractor and Landowners to ensure all parties are appropriately informed at all times.
- The Landowners must be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract including the Environmental Management Programme and landowner special conditions.
- Adequate planning of the construction programme to allow for disruptions due to rain and very wet conditions.
- Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. This will allow for easy assessment of any damage to the roads which may result from the construction process. If necessary some repairs should be done to prevent damage to equipment.
- All manmade as well as natural (vegetation) structures outside the boundary of the servitude shall be protected against damage at all times and any damage shall be rectified immediately.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections by the ECO and good control over the construction process throughout the construction period.
- Appointment of an ECO on behalf of the Contractor to implement this EMPr as well as deal with all Landowner related matters.
- Independent Environmental Audits to be carried out during and upon completion of construction.
- A formal communications protocol should be set up during this phase. The aim of the protocol should be to ensure that effective communication on key issues that may arise during construction be maintained between key parties such as the ECO, project manager and contractor. The protocol should also ensure that concerns / issues raised by I&APs are formally recorded and considered and where necessary acted upon. If necessary, a forum for communicating with key stakeholders on a regular basis may need to be set up. This could be done through an Environmental Monitoring Committee that would meet on a regular basis. The communications protocol should be maintained throughout the construction phase.

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.1.1 Authorisations, Permits and Licences</b>		
<ul style="list-style-type: none"> <li>▪ All necessary authorisations, permits and licences must be obtained by the Developer prior to the commencement of construction (if required).</li> </ul>	Developer	Once-off and On-going
<b>8.1.2 Appointment of Contractor</b>		
<ul style="list-style-type: none"> <li>▪ This EMPr must form part of any contractual agreements with a Contractor(s)</li> </ul>	Developer	Once-off



ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>and sub-contractors for the execution of the proposed project. The Contractor must make provision in their budgets for the implementation of the EMPr.</p> <ul style="list-style-type: none"> <li>▪ The principal Contractor (including sub-contractors and suppliers) must comply with the relevant provisions of the EMPr, applicable environmental legislation, by-laws and associated regulations promulgated in terms of these laws.</li> <li>▪ Tender documents must include statements which include the use of local communities or local community organisation(s) in supplying services and labour for the construction activities.</li> </ul>		
<b>8.1.3 Appointment of an ECO</b>		
<ul style="list-style-type: none"> <li>▪ Before any work commences on site the proponent must appoint an independent Environmental Control Officer (ECO) for the duration of the construction phase of the development that will have the responsibility to ensure that the mitigation / rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.</li> <li>▪ An Independent ECO must be appointed at the Developer's cost to monitor the implementation of the EMPr.</li> <li>▪ The ECO must undertake monthly site inspections and provide monthly audit reports for the duration of the construction and rehabilitation phases.</li> </ul>	<p>Developer Engineer Contractor</p>	Once-off
<b>8.1.4 Preparation of Method Statements</b>		
<ul style="list-style-type: none"> <li>▪ Method Statements must be submitted by the Contractor to the Developer's SHE Officer for approval and the ECO for comment prior to an activity being undertaken and must be adhered to by the Contractor and Project Engineer.</li> </ul>	<p>Contractor Developer ECO</p>	Once-off with updating if required
<b>8.1.5 Public Communication</b>		
<ul style="list-style-type: none"> <li>▪ The Developer must ensure that the adjacent community to the CSP Plant are informed and updated about the throughout the construction phases.</li> <li>▪ Sufficient signage must be erected around the site (including at the entrance), informing the public of the construction activities taking place.</li> <li>▪ The signboards must include the following information: <ul style="list-style-type: none"> <li>○ The name of the Contractor.</li> <li>○ The name and contact details of the site representative to be contacted in the event of emergencies or complaint registration.</li> </ul> </li> <li>▪ The Contractor must appoint a CLO (Community Liaison Officer).</li> </ul>	<p>Contractor</p>	Once-off
<b>8.1.6 Protected Flora</b>		
<ul style="list-style-type: none"> <li>▪ Prior to commencement of construction, an ecologist must be appointed to survey the construction footprint and working servitude for protected and important species, mark these species and apply for necessary permits and licences to destroy or relocate them.</li> <li>▪ A licence is required to handle the three nationally protected trees. The licence must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF) prior to construction.</li> <li>▪ The commencement of construction must be preceded by a plant rescue programme which must be conducted after receipt of the permits issued by DAFF.</li> <li>▪ No clearing of vegetation outside of the defined working servitudes is permitted for any reason (i.e. for fire wood or medicinal use).</li> </ul>	<p>Contractor, ECO, Ecologist, Aquatic Ecologist</p>	Once-off

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.1.7 Demarcation of the Construction Corridor and NO-GO Areas</b>		
<ul style="list-style-type: none"> <li>▪ All sensitive areas must be demarcated and these areas are off-limits to construction, operational vehicles and all personnel.</li> <li>▪ Materials stockpiling and storage must be done outside of the sensitive areas.</li> <li>▪ The construction corridor must be clearly demarcated using orange hazard bonnox fencing or brightly coloured shade cloth which must be erected and approved by the ECO prior to the commencement of any construction activities.</li> <li>▪ Any contractors found working inside the NO-GO areas must be fined as per fining system setup for the project.</li> </ul>	Contractor ECO	Once-off

## 8.2 Construction Phase

### 8.2.1 Site Clearing

Site clearing must take place in phased matter, as and when required. Areas which are not to be constructed on within two months of time must not be cleared to reduce erosion risks. The area to be cleared must be clearly demarcated and this footprint strictly maintained. Spoil that is removed from the site must be removed to an approved spoil site or DEA licensed landfill site. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent. These include watercourses and steep areas.

### 8.2.2 Site Establishment

Site establishment must take place in an orderly manner and all required amenities must be installed at camp sites before the main workforce move onto site. The construction camp must have the necessary ablution facilities with chemical toilets at commencement of construction. The Contractor must inform all site staff to make use of supplied ablution facilities and under no circumstances must indiscriminate sanitary activities be allowed other than in supplied facilities.

The Contractor must supply waste collection bins where such is not available and all solid waste collected shall be disposed of at a registered landfill. A certificate of disposal must be obtained by the Contractor and kept on file. Where a registered waste site is not available close to the construction site, the Contractor must provide a method statement with regard to waste management. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may solid waste be burnt on site.

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.2.3 Site Establishment and Clearing</b>		
<ul style="list-style-type: none"> <li>▪ Prior to the establishment of the site camp / office, the Contractor must produce a site layout plan showing the positions of all equipment storage, waste stockpiling, fuel storage areas and other infrastructure for approval of the ECO.</li> <li>▪ The camp must be located on a disturbed site that does not require the removal of vegetation, i.e. protected trees or plants.</li> <li>▪ The location of the site camp must be approved by the ECO prior to implementation.</li> <li>▪ The construction camp must have the necessary ablution facilities with chemical toilets at commencement of construction.</li> </ul>	Contractor SHE Officer ECO	Once-off
<ul style="list-style-type: none"> <li>▪ Unauthorised entry, stockpiling, dumping or storage of equipment, material or waste must be strictly prohibited in identified NO-GO areas.</li> <li>▪ Unauthorised access onto / into private properties is strictly prohibited.</li> </ul>	Contractor	Weekly
<b>8.2.4 Construction Traffic and Access</b>		
<p><b>Construction traffic</b></p> <ul style="list-style-type: none"> <li>▪ Construction routes must be clearly defined.</li> <li>▪ Delivery of equipment must be undertaken with the minimum amount of trips.</li> <li>▪ Access of all construction and material delivery vehicles should be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.</li> <li>▪ Planning of site delivery hours must be scheduled to avoid peak hour traffic,</li> </ul>	Contractor, ECO	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>weekends and evenings.</p> <ul style="list-style-type: none"> <li>▪ Wheel washing and damping down of un-surfaced roads must be implemented to reduce dust.</li> <li>▪ Vehicles and equipment shall be serviced regularly to avoid the contamination of soil from oil and hydraulic fluid leaks etc.</li> <li>▪ Servicing must be done off-site.</li> <li>▪ Oil changes must take place on a concrete platform or on a drip tray.</li> <li>▪ Soils compacted by construction shall be deep ripped to loosen compacted layers and re-graded to even running levels.</li> </ul>		
<p><b>Access</b></p> <ul style="list-style-type: none"> <li>▪ Temporary access roads that might be required must be rehabilitated prior to the contractor leaving the site.</li> <li>▪ Strategic positioning of entry and exit points to ensure as little effect as possible on the traffic.</li> <li>▪ The main routes to the site must be clearly signposted and printed delivery maps must be issued to all suppliers and Sub-Contractors.</li> <li>▪ Planning of temporary access routes to the site for construction purposes shall be done in conjunction between the Contractor, Developer and the Landowner(s). All agreements reached should be documented and no verbal agreements should be made The Contractor shall properly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY" sign.</li> <li>▪ Where new access roads are constructed, this must be done according to design and contract specifications. Drainage channels shall be suitably designed to ensure erosion does not occur, especially at the outflow points. The new access road shall be designed to allow for the natural flow of water where required. Crossing of dongas and eroded areas on access routes to new sites shall be thoroughly planned and installed according to design and contract specifications. All areas susceptible to erosion shall be protected with suitable erosion control measures from the onset of the project. Prevention is the ultimate aim, as restoration is normally very difficult and costly.</li> </ul>	Contractor, ECO	Weekly
<p><b>Road maintenance</b></p> <ul style="list-style-type: none"> <li>▪ Where necessary suitable measures shall be taken to rehabilitate damaged areas. In the event of rehabilitation work being required on private roads, such work will be done to the original specifications of the private road.</li> <li>▪ Contractors should ensure that access roads are maintained in good condition by attending to potholes, corrugations and stormwater damage as soon as these develop.</li> <li>▪ If necessary, staff must be employed to clean surfaced roads adjacent to construction sites where materials have spilt.</li> </ul>	Contractor, ECO	Weekly
<p><b>General</b></p> <ul style="list-style-type: none"> <li>▪ The Contractor shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelled as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place.</li> <li>▪ The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident.</li> <li>▪ Due precautions, including the monitoring of traffic speeds by all suppliers and sub-contractors where required, should be undertaken to prevent accidents leading to injury to persons on access roads and to minimise the likelihood of injury to wildlife.</li> </ul>	Contractor, ECO	Weekly
<b>8.2.5 Construction Camp</b>		
<b>Site of construction camp</b>	Contractor, ELO, ECO	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Choice of site for the Contractor's camp requires the Engineer and ECO's permission and must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the Engineer for approval.</li> <li>▪ The construction camp may not be situated within the 1:100 year flood line or on slopes greater than 1:3.</li> <li>▪ If the Contractor chooses to locate the camp site on private land, he must get prior permission from both the Engineer and the landowner.</li> <li>▪ The size of the construction camp should be minimized (especially where natural vegetation or grassland has had to be cleared for its construction).</li> <li>▪ Adequate parking must be provided for site staff and visitors. This must not inconvenience or serve as a nuisance for neighbours.</li> <li>▪ The Contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.</li> <li>▪ Suitable control measures over the Contractor's yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.</li> <li>▪ No development, or activity of any sort, is allowed below the 1:100 year flood line of any watercourse.</li> </ul>		
<p><b><i>Storage of materials (including hazardous materials)</i></b></p> <ul style="list-style-type: none"> <li>▪ Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general onsite topography and water erosion potential of the soil. Impervious surfaces must be provided where necessary.</li> <li>▪ Storage areas must be designated, demarcated and fenced.</li> <li>▪ Storage areas must be secure so as to minimize the risk of crime. They must also be safe from access by children / animals etc.</li> <li>▪ Fire prevention facilities must be present at all storage facilities.</li> <li>▪ Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume, and this should be sited away from drainage lines in a site with the approval of the Engineer.</li> <li>▪ Any water that collects in the bund must not be allowed to stand and must be removed immediately and the hydrocarbon digestion agent within must be replenished.</li> <li>▪ All legal compliance requirements with respect to Fuel storage and dispensing must be met.</li> <li>▪ All fuel storage tanks (temporary or permanent) and associated facilities must be designed and installed in accordance with the relevant oil industry standards, SANS codes and other relevant requirements.</li> <li>▪ Areas for storage of fuels and other flammable materials must comply with standard fire safety regulations and may require the approval of the Municipal Fire Prevention Officer.</li> <li>▪ Flammable fuel and gas must be well separated from all welding workshops, assembly plants and loading bays where ignition of gas by an accidental spark may cause an explosion or fire.</li> <li>▪ The tank must be erected at a safe distance from buildings, boundaries, welding sites and workshops and any other combustible or flammable materials.</li> <li>▪ Symbolic safety signs depicting "No Smoking", "No Naked Flames" and "Danger" are to be prominently displayed in and around the fuel storage area.</li> <li>▪ The capacity of the tank must be clearly displayed and the product contained within the tank clearly identified.</li> <li>▪ There must be adequate fire-fighting equipment at the fuel storage and</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>dispensing area or areas.</p> <ul style="list-style-type: none"> <li>▪ The storage tank must be removed on completion of the construction phase of the project.</li> <li>▪ All storage tanks must be designed and constructed in accordance with a recognised code (international standard).</li> <li>▪ The rated capacity of tanks must provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage.</li> <li>▪ Only empty and externally clean tanks must be stored on the bare ground. All empty and externally dirty tanks must be sealed and stored in an area where the ground has been protected.</li> <li>▪ Any electrical or petrol-driven pump must be equipped and positioned so as not to cause any danger of ignition of the product.</li> <li>▪ If fuel is dispensed from 200 litre drums, the proper dispensing equipment must be used.</li> <li>▪ The drum must not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank must be stored in a waterproof container when not in use.</li> <li>▪ All waste fuel and chemical impregnated rags must be stored in leak-proof containers and disposed of at an approved hazardous waste site.</li> <li>▪ The amounts of fuel and chemicals stored on site will be minimised.</li> <li>▪ Storage sites must be provided with bunds to contain any spilled liquids and materials.</li> <li>▪ These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.</li> <li>▪ Clear signage must be placed at all storage areas containing hazardous substances / materials.</li> <li>▪ Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible the available, MSDSs must additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.</li> <li>▪ Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.</li> <li>▪ A suitable Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at DWS licensed landfill sites designed to handle hazardous wastes.</li> <li>▪ The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</li> <li>▪ All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.</li> <li>▪ Any spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and DWS, as well as local authorities if so required.</li> </ul>		
<p><b><i>Drainage of construction camp</i></b></p> <ul style="list-style-type: none"> <li>▪ Run-off from the camp site must NOT discharge into neighbours' properties or into any water course.</li> </ul>	Contractor, ELO, ECO	Weekly
<p><b><i>End of construction</i></b></p> <ul style="list-style-type: none"> <li>▪ Once construction has been completed on site and all excess material has been removed, the storage area must be rehabilitated. If the area was badly damaged, re-seeding must be done and fencing in of the area must be considered if livestock/faunal species specific to the area may subsequently</li> </ul>	Contractor, ELO, ECO	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>have access to such an area.</p> <ul style="list-style-type: none"> <li>▪ Such areas must be rehabilitated to their natural state. Any spilled concrete must be removed and soil compacted during construction must be ripped, levelled and re-vegetated.</li> <li>▪ Only designated areas must be used for storage of construction materials, soil stockpiles, machinery and other equipment.</li> <li>▪ Specific areas must be designated for cement batching plants. Sufficient drainage for these plants must be in place to ensure that soils do not become contaminated.</li> <li>▪ The construction camp must be kept clear of litter at all times.</li> <li>▪ Spillages within the construction camp must be cleaned up immediately and disposed of in the hazardous skip bin for correct disposal.</li> <li>▪ No open fires are allowed within the construction camp and no wood from surrounding vegetation may be used to create a fire.</li> </ul>		
<h3>8.2.6 Repair, Maintenance and Cleaning</h3>		
<ul style="list-style-type: none"> <li>▪ No vehicle maintenance and repairs must be undertaken within a 30m radius of any drainage lines. Any facilities susceptible to oil, petrol and diesel spillage must be located a minimum of 30m and preferably 50m from the drainage line.</li> <li>▪ Repair yards, batching plants and stationary machines must be provided with sumps, and spilled fluids and runoff must be kept in a conservancy tank until removed from the site in terms of the relevant legislative requirements.</li> <li>▪ Adequate collection facilities such as diversion mounds, ditches, drains, oil separation sumps and sedimentation ponds must be constructed at each location with a pollution potential.</li> <li>▪ All repair work away from bunded areas must make use of drip trays.</li> <li>▪ Regular inspections must be carried out to detect leaks and spillages. These facilities must be maintained as regularly as is necessary to ensure they meet the original specification.</li> </ul>	Contractor, ECO	Monthly
<h3>8.2.7 Environmental Education and Training</h3>		
<p><b>Environmental training</b></p> <ul style="list-style-type: none"> <li>▪ Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics covered should include; <ul style="list-style-type: none"> <li>○ What is meant by “Environment”.</li> <li>○ Why the environment needs to be protected and conserved.</li> <li>○ How construction activities can impact on the environment.</li> <li>○ What can be done to mitigate against such impacts.</li> <li>○ Awareness of emergency and spills response provisions.</li> <li>○ Social responsibility during construction e.g. being considerate to local residents.</li> </ul> </li> <li>▪ It is the Contractor’s responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.</li> <li>▪ Training must be provided to the staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary.</li> <li>▪ Environmental awareness posters on site are encouraged.</li> <li>▪ The need for a “clean site” policy also needs to be explained to the workers.</li> <li>▪ Staff operating equipment (such as excavators, loaders, etc.) must be adequately trained and sensitised to any potential hazards associated with their tasks.</li> </ul>	Contractor, ECO	Monthly
<p><b>Monitoring of environmental training</b></p>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended.</li> </ul>		
<b>8.2.8 Borrow Pits</b>		
<p><b>Location of borrow pits</b></p> <ul style="list-style-type: none"> <li>Borrow pit localities must be negotiated with the relevant municipality to ensure consensus of their location.</li> <li>The Contractor is required to comply with the requirements of the Minerals Act (Act 50 of 1991). In terms of the Act, mining authorisation from the <u>Department of Minerals Resources</u> is a legal requirement. This application must include the Environmental Management Plan and is duly submitted to the Provincial Director of Mineral Development.</li> </ul>		
<p><b>Management of borrow pits</b></p> <ul style="list-style-type: none"> <li>The contractor must also compile an information document which states the methods which will be utilised when creating borrow pits. This document must include, but not be limited to the following: <ul style="list-style-type: none"> <li>Plans which detail the expected quantity of excavation that will be required.</li> <li>Temporary and permanent stormwater control.</li> <li>The final contouring of the borrow pit and the proposed method of rehabilitation.</li> <li>The current status and land use of the borrow pit.</li> <li>Topsoil management strategy (preservation of topsoil for reinstatement).</li> <li>Proposed management of dangerous conditions (e.g. steep slopes, loose and unstable material, holes).</li> </ul> </li> </ul>	Contractor, ELO, ECO	Monthly
<b>8.2.9 Water Pipeline Design</b>		
<ul style="list-style-type: none"> <li>No additions or upgrades to existing infrastructure along the route not included within the EIA must be undertaken. Additional process will need to be initiated should these be required.</li> <li>Points where the new water pipeline join up with the planned pump stations must be designed such to ensure that they can safely transfer water to the CSP and PV Augmentation plant.</li> <li>The footprints for block valves, CP Points and check valves must be kept to a minimum where they are required. Every effort must be made to place these as close to the permanent servitude as possible.</li> <li>It must be ensured that the carbon steel pipeline has been put through a rigorous quality control process to ensure good quality.</li> <li>The depth of the pipeline must be pre-determined for the various areas, should trenching of the pipeline be required. An engineer must inspect the trench before placement in sensitive areas to ensure that the pipeline is placed at the appropriate depth.</li> <li>The relevant ASME and API standards must be applied at all times during construction.</li> <li>Strict engineering supervision must be in place in areas where sensitive areas are crossed such as water courses and roads to ensure that these are carried out correctly and effectively.</li> <li>Water courses must be crossed making use of the DWS approved crossing methodology.</li> <li>A copy of this methodology must be kept on site at all times.</li> <li>In areas where access for property owners will be restricted, alternative</li> </ul>	Developer , Engineer	Monthly



ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>arrangements must be made with the relevant landowners and timeous notification ensured.</p> <ul style="list-style-type: none"> <li>▪ Rehabilitation of roads must be done to the original specifications.</li> <li>▪ Blasting must be done in accordance with the relevant by laws and SANS standards.</li> <li>▪ Pipeline must be placed as close as possible to existing infrastructure.</li> <li>▪ Extra cathodic protection must be placed in areas which place greater risks on the pipeline such as power lines and railways.</li> </ul>		
<b>8.2.10 Water pipeline construction</b>		
<p><b>General construction</b></p> <ul style="list-style-type: none"> <li>▪ Construction must be limited to daylight hours (06h00 – 18h00) in noise sensitive areas. Where construction is required after hours in order to avoid traffic interruptions, notification is to be sent out to all potentially affected landowners.</li> <li>▪ Notification must also be ensured when essential services such as water or electricity are to be affected by the construction process.</li> </ul>	Contractor, developer, Engineer	Bi-weekly
<p><b>Pipeline inspection</b></p> <ul style="list-style-type: none"> <li>▪ The water pipeline must be carefully inspected for defects. Suitable engineering measures must be taken to avoid corrosion of the pipeline.</li> <li>▪ The construction team must ensure that the correct pipe thickness is used according to the area it is to be placed within.</li> </ul>		
<p><b>Trenching</b></p> <ul style="list-style-type: none"> <li>▪ Explosives must be used according to the relevant by laws and SANS standards and according to the relevant guidelines, including the Occupational Health and Safety Act (Act 15 of 1973) and the Explosives Act (Act 26 of 1956)], should this be required.</li> <li>▪ Should trenching of the pipeline be required, then topsoil must be removed first and placed adjacent to the trench for reinstatement once the pipeline has been installed.</li> </ul>		
<p><b>Pipe bending</b></p> <ul style="list-style-type: none"> <li>▪ All pipe bending must be placed in accordance with design standards to ensure the integrity of the pipeline is maintained.</li> <li>▪ Pipe bends must be thoroughly checked for flaws prior to placement in the ground.</li> </ul>		
<p><b>Welding</b></p> <ul style="list-style-type: none"> <li>▪ All welding must undergo a rigorous series of quality control testing.</li> <li>▪ Non-destructive testing methods must be used to ensure the welds are in fact sufficiently sealed.</li> </ul>		
<p><b>Coating</b></p> <ul style="list-style-type: none"> <li>▪ The pipeline must be coated in Denso Wrapping, or similar, to ensure that the pipeline is protected from corrosion.</li> <li>▪ Coating materials must be utilised according to the surrounding environmental conditions.</li> </ul>		
<p><b>Lowering in</b></p> <ul style="list-style-type: none"> <li>▪ The lowering in of pipe section must be conducted so as not to jeopardise the welds.</li> </ul>		
<p><b>Backfilling</b></p> <ul style="list-style-type: none"> <li>▪ Soil must be replaced in reverse order to which it was removed with the topsoil being replaced last, should trenching of the pipeline be required.</li> </ul>		
<p><b>Reinstatement</b></p> <ul style="list-style-type: none"> <li>▪ The impacted areas must be deep ripped to loosen the soil.</li> <li>▪ The area must be rehabilitated accordingly to the satisfaction of the ECO.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.2.11 Specialised Construction Methods</b>		
<p><b>Open cut river and stream crossings</b></p> <ul style="list-style-type: none"> <li>These must be conducted according to the DWS approved crossing methodology for trenching, if required.</li> <li>The construction footprint must be kept to a minimum in these areas.</li> </ul>	Contractor & Developer, Engineer	Bi-weekly
<p><b>Directional drilling</b></p> <ul style="list-style-type: none"> <li>A detailed geotechnical study must be conducted by the proponent prior to any directional drilling taking place.</li> <li>A professional team with sufficient experience in HDD must be appointed by the proponent to conduct the necessary drilling.</li> </ul>		
<p><b>Road bores</b></p> <ul style="list-style-type: none"> <li>Road bores must be used as much as possible to cross major roads to avoid traffic interruptions.</li> <li>A professional team with sufficient experience in road bore projects must be appointed to conduct the necessary drilling.</li> </ul>		
<b>8.2.12 Water Pipeline Testing</b>		
<p><b>Hydrostatic testing</b></p> <ul style="list-style-type: none"> <li>Water saving practices must be undertaken during hydrostatic testing and water wastage must be avoided.</li> <li>Water utilised for hydrostatic testing must be disposed of accordingly at a DWS approved site. No water is to be discharged into the environment following testing.</li> <li>Care must be taken not to contaminate the surrounding soil while undertaking testing.</li> </ul>	Developer, Contractor, Engineer	Weekly
<p><b>Non-destructive testing (NDT)</b></p> <ul style="list-style-type: none"> <li>Materials used for NDT must be safely stored and soil contamination avoided.</li> </ul>		
<b>8.2.13 Soils and Geology</b>		
<p><b>Topsoil</b></p> <ul style="list-style-type: none"> <li>The contractor must, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil must be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This must include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.</li> <li>Care must be taken not to mix topsoil and subsoil during stripping.</li> <li>Should any topsoil become polluted the contractor must remove the polluted soil to the full depth of pollution and replace it at his own expense with approved topsoil which should be at least equal to Department of Agriculture approved topsoil specifications.</li> <li>Removed topsoil must be transported to a licensed landfill site or used onsite for landscaping as required.</li> </ul>	ECO, Contractor	Monthly
<p><b>Soil Stripping</b></p> <ul style="list-style-type: none"> <li>No soil stripping must take place on areas within the site that the contractor does not require for construction works or areas of retained vegetation.</li> <li>Subsoil and overburden must, in all construction and lay down areas, be stockpiled separately to be returned for backfilling in the correct soil horizon order.</li> <li>Construction vehicles must only be allowed to utilise existing tracks or pre-planned access routes.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p><b>Stockpiles</b></p> <ul style="list-style-type: none"> <li>▪ Stockpiles must not be situated such that they obstruct natural water pathways.</li> <li>▪ Stockpiles must not exceed 2m in height unless otherwise permitted by the Engineer.</li> <li>▪ If stockpiles are exposed to windy conditions or heavy rain, they must be covered either by vegetation or cloth, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases.</li> <li>▪ Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.</li> <li>▪ Where contamination of soil is expected, analysis must be done prior to disposal of excess soil to determine the appropriate disposal route. Proof from an applicable waste disposal site where contaminated soils are dumped if and when a spillage / leakage occur should be forwarded to the DEA / NC DENC.</li> </ul>		
<p><b>Fuel storage</b></p> <ul style="list-style-type: none"> <li>▪ Topsoil and subsoil must be protected from contamination.</li> <li>▪ Fuel and material storage must be away from stockpiles.</li> <li>▪ Cement, concrete and chemicals must be mixed on an impermeable surface and provisions should be made to contain spillages or overflows into the soil.</li> <li>▪ Any storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</li> <li>▪ Contaminated soil must be contained and disposed of off-site at an approved landfill site.</li> </ul>		
<p><b>Cement mixing</b></p> <ul style="list-style-type: none"> <li>▪ Concrete mixing must be contained within a bunded area.</li> <li>▪ Cement mixing must only take place within designated areas.</li> <li>▪ Ready mixed concrete must be utilised where possible.</li> <li>▪ No vehicles transporting concrete to the site may be washed on site.</li> <li>▪ If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Run-off from the batch plant must not be allowed to get into the storm water system or any rivers, streams, wetlands or existing erosion channels / dongas.</li> </ul>		
<p><b>Earthworks</b></p> <ul style="list-style-type: none"> <li>▪ All earthworks and borrow pits must be adequately controlled and managed.</li> <li>▪ Soils compacted during construction must be deeply ripped to loose compacted layers and re-graded to even running levels. Topsoil should be re-spread over landscaped areas. According to specifications by the Developer's Landscape Architect / Ecologist the area should be re-vegetated upon completion of construction activities.</li> <li>▪ It is very important that the foundation excavations for the proposed structures be inspected by an engineering geologist or geotechnical engineer prior to the placing of steel reinforcement or concrete in order to determine that the structure is being founded upon the correct material, and also to detect whether any active layers have been exposed by the foundation excavation.</li> </ul>		
<p><b>Herbicides / pesticides</b></p> <ul style="list-style-type: none"> <li>▪ Fertilisers must not be used excessively and slow release fertilizers and organic products must be used in preference to highly soluble and inorganic fertilizers.</li> <li>▪ The use of herbicides and pesticides and other horticultural chemicals must be carefully controlled wherever these are used. Where feasible, 'environmentally friendly' products should be utilised.</li> </ul>		
<p><b>Geology of the site</b></p>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Soil must be placed over area of blasting to minimise fly rock and noise.</li> <li>▪ Crack surveys in local area must be conducted to check for existing structural cracks so as to exclude risk of insurance claims to contractor / client from other parties.</li> <li>▪ Clear safe zone around blast point to prevent potential injury to personnel and damage to equipment on site. May include in certain situations halting traffic temporarily.</li> <li>▪ Inform local inhabitants / traffic of blast times.</li> </ul>		
<b>8.2.14 Erosion Control</b>		
<ul style="list-style-type: none"> <li>▪ Wind screening and stormwater control must be undertaken to prevent soil loss from the site.</li> <li>▪ The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</li> <li>▪ Other erosion control measures that can be implemented are as for the solar field: <ul style="list-style-type: none"> <li>○ Brush packing with cleared vegetation.</li> <li>○ Mulch, stone chip packing.</li> <li>○ Planting of vegetation.</li> <li>○ Hydroseeding / hand sowing.</li> </ul> </li> <li>▪ All erosion control mechanisms must be regularly maintained.</li> <li>▪ Seeding of topsoil and subsoil stockpiles must be undertaken to prevent wind and water erosion of soil surfaces.</li> <li>▪ Retention of vegetation must be undertaken where possible to avoid soil erosion.</li> <li>▪ Vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</li> <li>▪ Where possible re-vegetation of disturbed surfaces must occur immediately after construction activities are completed.</li> <li>▪ No impediment to the natural water flow other than approved erosion control works is permitted.</li> <li>▪ To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</li> <li>▪ Stockpiles not used in three (3) months after stripping must be seeded to prevent dust and erosion.</li> </ul>	ECO, Contractor	Bi-Monthly
<b>8.2.15 Ground and Surface Water Pollution</b>		
<p><b>Sanitation</b></p> <ul style="list-style-type: none"> <li>▪ Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</li> <li>▪ The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</li> </ul>	Main Contractor, ECO	Weekly
<p><b>Hazardous materials</b></p> <ul style="list-style-type: none"> <li>▪ Controlled use and or storage of materials, fuels and chemicals which could potentially leak into the ground.</li> <li>▪ All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</li> <li>▪ Any hazardous substances must be stored at least 20m from any water course.</li> <li>▪ The ELO must be responsible for ensuring that potentially harmful materials</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>are properly stored in a dry, secure environment, with concrete or sealed flooring and a means of preventing unauthorised entry.</p> <ul style="list-style-type: none"> <li>▪ Contaminated wastewater must be managed by the Site Manager to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp shall be collected and removed from the site for appropriate disposal at a licensed commercial facility.</li> </ul>		
<p><b>Cement mixing</b></p> <ul style="list-style-type: none"> <li>▪ Cement contaminated water must not enter the water system as this disturbs the natural acidity of the soil and affects plant growth.</li> </ul>		
<p><b>Public areas</b></p> <ul style="list-style-type: none"> <li>▪ Food preparation areas must be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which must be removed from site on a regular basis.</li> <li>▪ The contractor must take steps to ensure that littering by construction workers does not occur and persons must be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</li> <li>▪ No washing or servicing of vehicles on site.</li> </ul>		
<p><b>Water resources</b></p> <ul style="list-style-type: none"> <li>▪ Site staff must not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction or related activities.</li> <li>▪ Water sources/taps available for drinking water etc. must be pointed out by the ECO. It is not advisable that a contractor makes use of or collects water from any other source other than those pointed out to them as being suitable for use.</li> <li>▪ Treated raw water from the Orange River to be abstracted (or another source approved by the Engineer) must instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting, etc.</li> <li>▪ Department of Water and Sanitation and the ECO as well as other emergency contact numbers provided by the Municipality must be contacted in order to deal with spillages and contamination of aquatic environments.</li> <li>▪ Ensure that surface/storm water is diverted away from excavations.</li> <li>▪ If necessary ensure that stream flow bypasses the construction area within drainage lines.</li> <li>▪ Ensure that contaminants are safely stored and away from construction site.</li> <li>▪ Sufficient cleaning of pipeline before decommissioning and dismantling.</li> </ul>		
<p><b>Hydrotesting (if required)</b></p> <ul style="list-style-type: none"> <li>▪ In terms of hydrotesting, abstraction from identified water sources, authorised by <u>DWS</u>, will be used for hydrotesting</li> <li>▪ Any water discharge must comply with the water quality standards as agreed with <u>DWS</u>.</li> <li>▪ Both abstraction and discharge permits must be obtained from <u>DWS</u>.</li> </ul>		
<p><b>Slow leaks</b></p> <ul style="list-style-type: none"> <li>▪ Regular visual inspection of the entire pipeline must be conducted to detect leakages</li> </ul>		
<p><b>Ruptures</b></p> <ul style="list-style-type: none"> <li>▪ Installation of remote controlled and/or automatic shut off valves at regular intervals along the pipeline. These valves must be activated by pressure loss in the pipeline or activated on instruction when a major leak is noticed or observed.</li> </ul>		
<p><b>Water Flows Across Construction Sites</b></p> <ul style="list-style-type: none"> <li>▪ Adequate measures must be put into place to control surface water flows across and around all construction sites.</li> <li>▪ The quantity of uncontaminated stormwater entering cleared areas must be</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>minimised by appropriate site design and by installation of control structures and drains which direct such flows away from cleared areas and slopes to stable (vegetated) areas or effective treatment installations.</p> <ul style="list-style-type: none"> <li>▪ Site drainage lines must be identified and control measures installed to handle predicted stormwater.</li> </ul>		
<b>8.2.16 Hydrology and Stormwater</b>		
<ul style="list-style-type: none"> <li>▪ The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.</li> <li>▪ Adequate stormwater management must be provided that won't aggravate the erosion of the river banks.</li> <li>▪ Silt fences must be used to prevent any soil entering the stormwater drains.</li> <li>▪ Temporary cut of drains and berms may be required to capture stormwater.</li> <li>▪ Promote a "water saving" mind set with construction workers in order to ensure less water wastage.</li> <li>▪ New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency.</li> <li>▪ Hazardous substances must be stored at least 20m away from the buffer area surrounding any water course on site to avoid pollution.</li> <li>▪ The installation of the stormwater system must take place as soon as possible after commencement of construction, to attenuate stormwater from the construction phase as well as the operation phase.</li> <li>▪ Earth, stone and rubble must be properly disposed of so as not to obstruct natural water path ways over the site i.e. these materials must not be placed in stormwater channels or water courses.</li> <li>▪ There must be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.</li> <li>▪ If a batching plant is necessary, run-off must be managed effectively to avoid contamination of other areas of the site. Run-off from the batch plant must not be allowed to get into the stormwater system or nearby streams, rivers or erosion channels or dongas.</li> </ul>		
<b>8.2.17 Air Quality</b>		
<p>All activities on-site must comply with the requirements of the National Environmental Management: Air Quality Act (Act No. 39 of 2004).</p> <p><b>Dust control</b></p> <ul style="list-style-type: none"> <li>▪ Wheel washing and damping down of un-surfaced and un-vegetated areas.</li> <li>▪ Retention of vegetation where possible will reduce dust travel</li> <li>▪ Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>▪ Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.</li> <li>▪ Blasting must be carried out in accordance with legislation using optimal and not excessive quantities of explosives. Blasting must only occur on calm days in order to reduce dust carry. The geotechnical report indicated that the probability of blasting is low.</li> <li>▪ The Contractor must be responsible for dust control on site to ensure no nuisance is caused to the Landowner or neighbouring Communities.</li> <li>▪ A speed limit of 30km/h must not be exceeded.</li> <li>▪ Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</li> </ul>	Contractor, ELO	Daily

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Ensure that batching plants are fitted with the appropriate filters.</li> <li>▪ Spoil dumps will be positioned such that they are not vulnerable to wind erosion.</li> </ul> <p><b>Odour control</b></p> <ul style="list-style-type: none"> <li>▪ Regular servicing vehicles must be undertaken in order to limit gaseous emissions (to be done off-site).</li> <li>▪ Regular servicing of on-site ablution facilities to avoid potential odours.</li> <li>▪ Allocated cooking areas must be provided.</li> <li>▪ The contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. Liquid Petroleum Gas cookers may be used provided that all safety regulations are followed.</li> <li>▪ Waste must be disposed, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours and attracting vermin.</li> </ul> <p><b>Rehabilitation</b></p> <ul style="list-style-type: none"> <li>▪ The contractor must commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</li> </ul> <p><b>Fire prevention</b></p> <ul style="list-style-type: none"> <li>▪ Burning of materials including wood, grass and refuse which emit visible smoke must not be permitted on construction sites.</li> <li>▪ The contractor must ensure that any grass left in a natural state during construction should be cut in order to prevent veld fires, especially during the dry months.</li> <li>▪ No open fires must be allowed on site under any circumstance (National Forest Act, Act No 84 of 1998). All cooking must be done in demarcated areas that are safe and cannot cause runaway fires.</li> <li>▪ The Contractor must have operational fire-fighting equipment available on site, especially during the winter months.</li> </ul>		
<b>8.2.18 Noise</b>		
<ul style="list-style-type: none"> <li>▪ Construction site yards and other noisy fixed facilities must be located well away from noise sensitive areas adjacent to the development sites. Once the final CSP plant layout and water and power line alignments are made available by the contractor(s), the sites must be evaluated in detail and specific measures designed into the system.</li> <li>▪ All construction vehicles and equipment are must be kept in good repair.</li> <li>▪ Where possible, stationary noisy equipment (for example compressors, pumps, pneumatic breakers,) must be encapsulated in acoustic covers, screens or sheds. Proper sound insulation can reduce noise by up to 20dBA. Portable acoustic shields must be used in the case where noisy equipment is not stationary (for example drills, angle grinders, chipping hammers, poker vibrators).</li> <li>▪ Construction activities, and particularly the noisy ones, must be contained to reasonable hours during the day and early evening.</li> <li>▪ With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor must liaise with local residents on how best to minimise the impact.</li> <li>▪ Machines in intermittent use must be shut down in the intervening periods between work or throttled down to a minimum.</li> <li>▪ In general, operations must meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).</li> <li>▪ Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA must wear ear protection equipment.</li> <li>▪ Noise levels must be kept within acceptable limits. All noise and sounds generated must adhere to SABS 0103 specifications for maximum allowable</li> </ul>	Contractor, ELO	Daily

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>noise levels for residential areas. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies.</p> <ul style="list-style-type: none"> <li>▪ Noisy operations must be combined so that they occur where possible at the same time.</li> <li>▪ Blasting operations (if required) are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timings of explosions. The number of blasts per day must be limited, blasting must be undertaken at the same times each day and no blasting should be allowed at night.</li> <li>▪ With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor and ECO must liaise with local residents on how best to minimise impact, and the local population must be kept informed of the nature and duration of intended activities.</li> <li>▪ Noise from labourers must be controlled.</li> <li>▪ Noise suppression measures must be applied to all construction equipment. Construction equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the contractor may be instructed to remove the offending vehicle or machinery from site.</li> <li>▪ The contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour must be transported to and from the site by the contractor or his Sub-Contractors by the contractors own transport.</li> <li>▪ Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activities near noise sensitive areas should not be allowed.</li> </ul>		
<b>8.2.19 Flora</b>		
<ul style="list-style-type: none"> <li>▪ During the construction phase workers must be limited to areas under construction and access to the undeveloped areas, especially the surrounding open areas must be strictly regulated (“no-go” areas during construction activities</li> <li>▪ The site must be fenced prior to construction activities and remain fenced off.</li> <li>▪ Protected, endangered and threatened species that are encountered, special care must be taken not to damage or remove any such species unless absolutely necessary.</li> <li>▪ All plants not interfering with the operation of the line must be left undisturbed.</li> <li>▪ Collection of firewood and traditional medicinal plants is strictly prohibited. No area must be cleared of trees, bushes and other vegetation for the purpose of a camping site.</li> <li>▪ Gardens or landscaped areas around the proposed CSP plant development must be planted with indigenous (preferably using endemic or local species from the area) grasses, forbs, shrubs and trees, which are water wise and require minimal horticultural practices.</li> <li>▪ All alien vegetation must be eradicated over a five-year period. Invasive species must be given the highest priority</li> <li>▪ The construction of the water pipeline and power line could result in limited opening-up of the vegetal cover during the construction phase. The opening up of existing vegetated areas, thereby creating corridors along which animals can move, may result in increased predation levels on small mammals, reptiles, amphibians, arachnids and scorpions along these corridors.</li> <li>▪ The limitation of the disturbance of vegetation cover as well as rocky</li> </ul>	ECO, ELO	Weekly



ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>outcrops, logs, stumps, termite mounds within sensitive areas will ameliorate this impact</p> <ul style="list-style-type: none"> <li>▪ Prior to construction and vegetation clearance an ECO should closely examine the proposed construction areas (substation and concrete supports of loop in line) for the presence of any animal burrows (including spiders and scorpions), rocky outcrops, logs, stumps and other debris and relocate any affected animals to appropriate habitat away from the servitude or tower.</li> <li>▪ The removal of all economically valuable trees or vegetation must be negotiated with the landowner before such vegetation is removed.</li> <li>▪ Vegetation clearing on water pipeline support beams and/or pylon sites must be kept to a minimum. Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root systems are removed. Stumps shall be treated with herbicide. Smaller vegetation can be flattened with a machine, but the blade should be kept above ground level to prevent scalping. Any vegetation cleared on water pipeline support beams and/or pylon sites shall be removed or flattened and not be pushed to form an embankment around the water pipeline support beams and/or pylon sites.</li> <li>▪ Protected, endangered and threatened species of plants must not be removed unless they are interfering with a structure. Where such species have to be removed due to interference with a structure, the necessary permission and permits must be obtained from Provincial Nature Conservation and the Department of Forestry.</li> <li>▪ Disturbed areas of natural vegetation as well as cut and fills must be rehabilitated immediately to prevent soil erosion.</li> </ul>		
<p><b>Rehabilitation</b></p> <ul style="list-style-type: none"> <li>▪ All damaged areas must be rehabilitated upon completion of the contract in accordance with design specifications. In accordance with the Conservation of Agricultural Resources Act, Act No 43 of 1983, slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Extra seed shall be sown on disturbed areas as directed by the ECO (see below for specifications). Other methods of rehabilitating disturbed sites may also be used at the discretion of the Project Manager to comply with the conditions of the EA and EMP, e.g. stone pitching, logging, etc. Contour banks shall be spaced according to the slopes. The type of soil shall also be taken into consideration.</li> <li>▪ An Environmental Conservation Officer (ECO) must be present to facilitate watercourse and riparian habitat rehabilitation efforts.</li> <li>▪ The ECO must be educated in general river rehabilitation measures and how to identify emerging and potential problems.</li> <li>▪ A mixture of vegetation seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> <li>▪ Annual and perennial species are chosen.</li> <li>▪ Pioneer species are included.</li> <li>▪ All the species must not be edible.</li> <li>▪ Species chosen will grow in the area under natural conditions.</li> <li>▪ Root systems must have a binding effect on the soil.</li> <li>▪ The final product must not cause an ecological imbalance in the area.</li> </ul> </li> <li>▪ To get the best results in a specific area, it is a good idea to consult with a vegetation specialist or the local Extension Officer of the <u>Department of Agriculture</u>. Seed distributors can also give valuable advice as to the mixtures and amount of seed necessary to seed a certain area.</li> <li>▪ All natural areas impacted during construction must be rehabilitated with locally indigenous grasses.</li> <li>▪ Fragmentation must be kept to a minimum. Rehabilitation of the final servitude will ensure that fragmentation is kept to a minimum.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Rehabilitation must take place as soon as construction is complete to avoid the edge effect, the infiltration of alien species and soil erosion within the servitude.</li> <li>▪ Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</li> </ul>		
<p><b>Permits/Licences</b></p> <ul style="list-style-type: none"> <li>▪ Permits/Licence (in terms of the National Forest Act, Act 84 of 1998) for the removal of any protected, endangered and threatened species must be obtained from Provincial Nature Conservation should such species be affected.</li> <li>▪ Should impacts on protected, threatened or endangered tree individuals be unavoidable, obtain necessary and required approval per application for damage/ removal/ cutting/ pruning of protected, threatened or endangered tree species from Department of Forestry, as per National Forests Act (Act No. 84 of 1998) under Government Notice GN 1012 of 2004 and GN 767 of 2005 or Provincial Nature Conservation.</li> </ul>		
<p><b>Demarcation of construction servitude</b></p> <ul style="list-style-type: none"> <li>▪ All plants not interfering with the construction of the CSP and <u>PV Augmentation</u> plant and associated infrastructure (water pipeline and power line) must be left undisturbed, unless clearing is required for a fire-break or other fire safety precaution, and clearly marked and indicated on the site plan.</li> <li>▪ The construction site /servitude must be well demarcated and no construction activities must be allowed outside of this demarcated footprint.</li> <li>▪ Areas which are identified by the Engineer or the ECO as being ecologically sensitive and which are adjacent to any construction work are to be suitably demarcated to prevent damage by labour and equipment.</li> <li>▪ Only vegetation within the site / servitude must be removed, unless clearing adjacent to the site is required for a fire-break or other fire safety precaution.</li> <li>▪ Vegetation removal must be phased in order to reduce impact of construction.</li> <li>▪ Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</li> <li>▪ Strict and regular auditing of CSP and <u>PV Augmentation</u> plant and infrastructure construction process to ensure containment of the construction site / servitude.</li> <li>▪ Where the pipeline alignment passes intact vegetation (but does not impact on it), a buffer zone must be established to ensure that construction activities do not extend into these areas.</li> <li>▪ Construction areas must be well demarcated and these areas strictly adhered to.</li> <li>▪ Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.</li> </ul>		
<p><b>Utilisation of resources</b></p> <ul style="list-style-type: none"> <li>▪ Gathering of firewood, fruit, muthi plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.</li> </ul>		
<p><b>Exotic vegetation</b></p> <ul style="list-style-type: none"> <li>▪ All exotic vegetation must be removed from site.</li> <li>▪ Alien vegetation on the site must be controlled in terms of Government Notice R1048.</li> <li>▪ The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.</li> <li>▪ The spread of exotic species occurring throughout the site must be</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>controlled.</p> <p><b>Herbicides</b></p> <ul style="list-style-type: none"> <li>▪ Herbicide use must only be allowed with the approval of ACWA Power SolAfrica Bokpoort CSP Plant (Pty) Ltd (RF) and according to contract specifications. The application must be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment must be properly investigated and only environmentally friendly herbicides must be used.</li> <li>▪ The use of pesticides and herbicides within the servitude must be discouraged as this will impact on important pollinator species of indigenous vegetation.</li> </ul>		
<p><b>Construction schedule</b></p> <ul style="list-style-type: none"> <li>▪ Where possible, construction must take place during winter i.e. the dormant stage to minimise impacts on vegetation during the growing season.</li> </ul>		
<p><b>Construction/ Infrastructure/ Access Roads</b></p> <ul style="list-style-type: none"> <li>▪ The Contractor must select a suitable level area free of rock and large bushes for tower assembly in the case of required power lines.</li> <li>▪ Demarcate construction areas in order to control movement of personnel, vehicles, providing boundaries for construction sites in order to limit spread of impacts.</li> <li>▪ Access is to be established by vehicles passing over the same track on natural ground; multiple tracks are not permitted.</li> <li>▪ Prohibit construction of new access roads as far as possible. Use must be made of existing roads, ensuring proper maintenance/ upgrade.</li> <li>▪ Provide temporary on-site ablution, sanitation, litter and waste management and hazardous materials management facilities during entire construction period.</li> <li>▪ Abluting anywhere other than in provided toilets must not be permitted. Under no circumstances shall use of the veld be permitted.</li> <li>▪ Remove and store topsoil separately in areas where excavation/ degradation takes place. Topsoil must be used for rehabilitation purposes in order to facilitate regrowth of species that occur naturally in the area.</li> <li>▪ Ensure off site storage of hazardous materials, chemicals, fuels, oils, etc. in order to prevent accidental spillage, contamination or pollution.</li> <li>▪ Develop emergency maintenance operational plan to deal with any event of contamination, pollution or spillages, particularly in sensitive areas.</li> <li>▪ Ensure proper surface restoration and resloping in order to prevent erosion, taking cognisance of local contours and landscaping.</li> </ul>		
<p><b>Vegetation</b></p> <ul style="list-style-type: none"> <li>▪ Weed control methods must be confirmed with the ECO to prevent any undesirable secondary impacts.</li> <li>▪ Removal of vegetation/ plants must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible.</li> <li>▪ Disturbance of vegetation must be limited to areas of construction.</li> <li>▪ The removal or picking of any protected, endangered, threatened or unprotected plants shall not be permitted and no horticultural specimens (even within the demarcated working area) must be removed, damaged or tampered with unless agreed to by the ECO.</li> <li>▪ No painting or marking of rocks or vegetation to identify locality or other information must be allowed as it will disfigure the natural setting. Marking must be done by steel stakes with tags, if required.</li> <li>▪ Cut vegetation (grass and shrubs) only if and when required. No clearing of vegetation or soil by grading machinery must be undertaken.</li> <li>▪ Limit damage/ pruning/ cutting of indigenous trees to a minimum.</li> <li>▪ Exposed areas with slopes less than 1:3 must be rehabilitated with a grass</li> </ul>	ECO, ELO and Appointed Ecologist	Weekly, Once-Off

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>mix that blends in with the surrounding vegetation.</p> <ul style="list-style-type: none"> <li>▪ The grass mix must consist of indigenous grasses adapted to the local environmental conditions.</li> <li>▪ The re-vegetated areas must be temporarily fenced to prevent damage by grazing animals</li> <li>▪ Re-vegetated areas showing inadequate surface coverage (less than 30% within eight months after re-vegetation) must be prepared and re-vegetated from scratch.</li> <li>▪ Damage to re-vegetated areas must be repaired promptly;</li> <li>▪ Re-vegetated areas must be monitored every four months for the first 12 months and once a year thereafter for the maintenance period of two years.</li> <li>▪ Plant search and rescue (i.e. the location and removal of specified plant species, without unnecessary damage, and their transfer to a specified location) and the collection of seed, will be conducted by the ECO prior to the onset of any site clearing operations.</li> <li>▪ All individuals/ stands of protected, endangered or threatened trees must be clearly and visibly marked prior to the start of construction or maintenance procedures.</li> <li>▪ Marking must be done by means of semi-permanent (removable) marker tape.</li> <li>▪ Information pertaining to these plants must be included in the induction for all workers and contractors.</li> <li>▪ Cutting/ pruning/ damaging of any protected tree species (<i>Acacia erioloba</i>, <i>Boscia albitrunca</i>) individual, must not be allowed under any circumstances.</li> <li>▪ All protected, threatened and endangered tree individuals must be clearly marked and GPS referenced prior to the commencement of construction activities.</li> <li>▪ Should impacts on protected, endangered or threatened tree individuals be unavoidable, obtain necessary and required approval per application for damage/ removal/ cutting/ pruning of protected tree species from Department of Forestry, as per National Forests Act (Act No. 84 of 1998) under Government Notice GN 1012 of 2004 and GN 767 of 2005 and Provincial Nature Conservation.</li> </ul>		
<p><b>Fires</b></p> <ul style="list-style-type: none"> <li>▪ Use of branches of trees and shrubs for fire making purposes is strictly prohibited.</li> <li>▪ Prevent open fires; provide demarcated fire-safe zones, facilities and fire control measures.</li> <li>▪ Firefighting equipment must be made available on all vehicles and at various suitable points within the development site.</li> <li>▪ The landowner / developer must take cognisance of and adhere to the provisions highlighted in sections 12 to 16 of Chapter 4 and section 17 of Chapter 5 of the National Veld and Forest Fire Act, Act No. 101 of 1998.</li> </ul>		
<b>8.2.20 Fauna</b>		
<ul style="list-style-type: none"> <li>▪ No disturbing, injuring or killing of any fauna (including snakes) for any purposes.</li> <li>▪ No feeding of wildlife.</li> <li>▪ Fishing and hunting of local fauna is prohibited.</li> <li>▪ No domestic animals are to be brought onto the site.</li> <li>▪ The construction site must be kept clean and tidy and free from rubbish which would attract animal pest species.</li> <li>▪ Containment of construction site through identified sensitive areas</li> <li>▪ Demarcation of sensitive areas prior to construction activities starting</li> <li>▪ Use of appropriate construction techniques (for example pipe-jacking)</li> </ul>	ECO, ELO	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Intensive environmental auditing in these areas (daily audits recommended).</li> <li>▪ Rehabilitation to be undertaken as soon as possible after construction in sensitive area has been completed. The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase.</li> <li>▪ Construction activities must be planned carefully so as not to interfere with the calving and lambing season for most animal species.</li> <li>▪ The Contractor's workforce must be very careful not to disturb the animals as this may lead to fatalities which will give rise to claims from the Landowners.</li> <li>▪ The Contractor must under no circumstances interfere with livestock without the Landowner being present.</li> <li>▪ Numerous dangerous wild animals and arachnids and scorpions occur around the CSP plant site and along the water pipeline and power line and thus safety measures must be implemented to ensure the safety of the contractors and sub-contractors.</li> <li>▪ Care should be taken when removing stumps, logs or rock material. Any scorpions encountered on the site should be left alone and allowed free access away from the activity or safely removed from the area. No scorpions should be intentionally killed.</li> <li>▪ Fauna species must not be harmed or killed and allowed free movement away from the area. Safety precaution measure must be implemented especially during the vegetation clearance phase.</li> <li>▪ The frequent burning of the vegetation will have a high impact on remaining reptile species. Fires during the winter months will severely impact on the hibernating species, which are extremely sluggish. Fires during the early summer months destroy the emerging reptiles as well as refuge areas increasing predation risks.</li> <li>▪ All necessary mitigation measures must be implemented to minimise impacts on the environment</li> <li>▪ No animal may be hunted, trapped or killed for any purpose whatsoever.</li> <li>▪ Any development of infrastructure within the watercourse that could potentially block up and downstream migratory activity of fish and other aquatic biota should incorporate a fish way. The input of a suitably qualified fish ecologist should be sought when the weirs are designed and constructed;</li> <li>▪ Ensure proper substrate anchorage, provide 'dummy pole' for power lines in order to prevent damage/ injury of mammals as a result of direct contact with pole structures.</li> <li>▪ In the event that animals are present that may pose a risk to human safety, a suitable animal handler must be requested to remove the animal in an environmentally responsible manner. This specifically refers to snakes and scorpions.</li> <li>▪ The Contractor must, as soon as reasonably possible, but within 24 hours of becoming aware of a complaint relating to wildlife interaction, respond to the complaint and register the complaint in the Environmental Register. In addition, the complaint must be reported to the ECO as soon as possible such that the incident can be investigated by the ECO or Contractor.</li> </ul>		
<b>8.2.21 Surface Water Features</b>		
<p><b>General</b></p> <ul style="list-style-type: none"> <li>▪ No water must be abstracted from any watercourse crossed by the plant development unless the abstraction of water has been authorised by the Department of Water Affairs and any required EIA studies have been undertaken and the proposed activity has received authorisation from the relevant determining authority.</li> </ul>	Contractor, ECO, ELO, Engineer	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Where dewatering of trenches is required especially in the wet zone of the Orange River, the water from the dewatering operation must be cleaned of any excess silt and be discharged back into a downstream portion of the river in a manner that does not cause the initiation of soil erosion.</li> <li>▪ During the CSP plant and associated infrastructure construction, the footprint of the construction area as it traverses water courses must be kept as narrow as possible to ensure least potential damage to such water courses being crossed.</li> <li>▪ No stockpile areas (this excludes vegetation blocks removed from the trench) must be located within water course boundaries, or within the associated buffer zone.</li> <li>▪ No hazardous materials (such as oil) must be kept within 1:100 floodline of a water course.</li> <li>▪ Contractors responsible for constructing the water pipeline and overhead power line crossing water courses must sign a declaration stating that they will adhere to all stipulations of the Environmental Management Plan relating to the water course crossings.</li> <li>▪ Detailed crossing methodologies for each individual water course by the proposed pipeline and/or power line must be developed once detailed design of the pipeline / power line has been concluded. Crossing methodologies must take 1:100 year floodline into account; it remains the responsibility of the Engineer to ensure that the pipeline is constructed to withstand flood events.</li> </ul>		
<p><b>Erosion Control</b></p> <ul style="list-style-type: none"> <li>▪ Where possible, silt fences / barriers or other relevant measures must be installed along the edge of the watercourse to prevent soil erosion and ingress of runoff water carrying silt to enter the water course.</li> </ul>		
<p><b>Trenching</b></p> <ul style="list-style-type: none"> <li>▪ Where trenching is done, soils removed must be returned in the same order as they were removed to reinstate any subsurface layering of the profiles. Topsoil should be stored on and covered by a geo-textile membrane. Each subsequent soil horizon must be stored separately on a geo-textile membrane. These soil horizons must be returned in the order they were taken out.</li> </ul>		
<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>▪ No roads should be constructed through water courses.</li> </ul>		
<b>8.2.22 Agricultural Potential</b>		
<ul style="list-style-type: none"> <li>▪ All land users must be adequately informed of the CSP plant location and associated infrastructure (water pipeline and power line and <u>PV plant</u>) and alignments in writing and by the provision of permanent surface markers/indicators to show the position.</li> </ul>	Main Contractor, ECO	Monthly
<b>8.2.23 Employment</b>		
<ul style="list-style-type: none"> <li>▪ The use of labour intensive construction measures must be used where appropriate.</li> <li>▪ Training of labour to benefit individuals beyond completion of the project</li> <li>▪ Labour to be sourced from the local community where possible</li> <li>▪ Local suppliers to be used where possible.</li> <li>▪ The Project Manager must ensure that all staff working on the proposed project must be in possession of a South African Identity Document or suitable valid work permit documentation from the Department of Home Affairs.</li> </ul>	Developer, Main Contractor, ECO, ELO	Weekly
<b>8.2.24 Waste Management</b>		
<b>Construction rubble</b>	Contractor, ECO,	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ All rubble from demolition activities must either be used on site as part of the existing development, or must be taken off the reserve and disposed off at an approved site.</li> <li>▪ Rubble must not be dumped on site but must be placed within a skip bin for regular removal.</li> <li>▪ Construction rubble must be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the relevant Municipality.</li> </ul>	ELO	
<p><b>Litter management</b></p> <ul style="list-style-type: none"> <li>▪ Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.</li> <li>▪ A housekeeping team must be appointed to regularly maintain the litter and rubble situation on the construction site.</li> <li>▪ Waste disposal must take place in terms of requirements of the National Environmental Management: Waste Act (59 of 2008).</li> <li>▪ If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling.</li> <li>▪ Littering by the employees of the Contractor must not be allowed under any circumstances. The ECO must monitor the neatness of the work sites as well as the Contractor campsite.</li> <li>▪ Skip waste containers must be maintained on site. These must be kept covered and arrangements made for them to be collected regularly from the site by the local council or a private waste contractor.</li> <li>▪ All waste must be removed from the site and transported to a landfill site as approved by the relevant Municipality.</li> <li>▪ Waybills providing disposal at each site must be provided to the Engineer's inspection.</li> </ul>		
<p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>▪ All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of off-site at a licensed landfill site.</li> <li>▪ Contaminants to be stored safely to avoid spillage.</li> <li>▪ Machinery must be properly maintained to keep oil leaks in check.</li> </ul>		
<p><b>Sanitation</b></p> <ul style="list-style-type: none"> <li>▪ The Contractor must install mobile chemical toilets on the site.</li> <li>▪ The exact location of the toilets must be approved by the SHE Officer/ECO prior to establishment.</li> <li>▪ All temporary/portable toilets must be secured to the ground to prevent them from toppling due to wind or any other cause.</li> <li>▪ The Contractor must ensure that the entrances to toilets are adequately screened from public view.</li> <li>▪ Suitable toilets must be provided for the staff at all points at which workmen are carrying out duties under the contract.</li> <li>▪ The Contractor must ensure that no spillage occurs when the toilets are cleaned or emptied.</li> <li>▪ Staff must be sensitised to the fact that they must use these facilities at all times. No indiscriminate sanitary activities on site must be allowed.</li> <li>▪ All ablution activities must take place in these facilities, and the waste material must be stored and disposed of at the registered waste disposal site or collected by a suitable waste contractor on a regular basis.</li> <li>▪ Ablution facilities must be within 100m from workplaces but not closer than 150m from any watercourses or boreholes. There must be enough toilets available to accommodate the workforce (minimum requirement 1:15 workers). Male and females must be accommodated separately where possible.</li> <li>▪ Toilets must be serviced regularly and the ECO must inspect toilets regularly.</li> <li>▪ Toilets must be no closer than 150m or above the 1:100 year flood line from any watercourse or alternatively located in a place approved of by the</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>Engineer.</p> <ul style="list-style-type: none"> <li>▪ Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</li> <li>▪ The construction of "Long Drop" toilets are not allowed.</li> <li>▪ Potable water must be provided for all construction staff.</li> </ul> <ul style="list-style-type: none"> <li>▪ Remedial actions</li> <li>▪ Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</li> <li>▪ Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</li> <li>▪ The Environmental Managers must determine the precise method of treatment of polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</li> <li>▪ If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent pads.</li> <li>▪ If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</li> <li>▪ Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</li> <li>▪ Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</li> </ul>		
<b>8.2.25 Health and safety</b>		
<p><b>Worker safety</b></p> <ul style="list-style-type: none"> <li>▪ Implementation of safety measures, work procedures and first aid must be implemented on site.</li> <li>▪ A health and safety plan in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) must be drawn up to ensure worker safety.</li> <li>▪ Workers must be thoroughly trained in using potentially dangerous equipment</li> <li>▪ Contractors must ensure that all equipment is maintained in a safe operating condition.</li> <li>▪ A safety officer must be appointed.</li> <li>▪ A record of health and safety incidents must be kept on site.</li> <li>▪ Any health and safety incidents must be reported to the project manager immediately.</li> <li>▪ First aid facilities must be available on site at all times.</li> <li>▪ Workers have the right to refuse work in unsafe conditions.</li> <li>▪ The Contractor must take all the necessary precautions against the spreading of disease such as measles, foot and mouth, etc. especially under livestock.</li> <li>▪ A record must be kept of drugs administered or precautions taken and the time and dates when this was done. This can then be used as evidence in court should any claims be instituted against the Developer or the Contractor.</li> <li>▪ The contractor must ensure that all construction workers are well educated about HIV/ AIDS and the risks surrounding this disease. The location of the local clinic where more information and counselling is offered must be indicated to workers.</li> <li>▪ Material stockpiles or stacks, such as, pipes must be stable and well secured to avoid collapse and possible injury to site workers / local residents.</li> </ul> <p><b>Worker facilities</b></p> <ul style="list-style-type: none"> <li>▪ Eating areas must be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.</li> <li>▪ Fires are not to be allowed.</li> </ul> <p><b>Protective gear</b></p>	Developer, Contractor, ECO, ELO	Daily



ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Personal Protective Equipment (PPE) must be made available to all construction staff and their usage must be compulsory. Hard hats and safety shoes must be worn at all times and other PPE worn where necessary i.e. dust masks, ear plugs etc.</li> <li>▪ No person must enter the site without the necessary PPE.</li> <li>▪ SABS Standards and specifications governing dangerous processes such as welding and radiographic testing of welds must be strictly applied, with a view to proper protection of the public and workers.</li> </ul>		
<p><b>Site safety</b></p> <ul style="list-style-type: none"> <li>▪ The construction camp must remain fenced for the entire construction period.</li> <li>▪ Potentially hazardous areas such as trenches must be demarcated and clearly marked</li> <li>▪ Adequate warning signs of hazardous working areas.</li> <li>▪ Uncovered manholes and excavations must be clearly demarcated</li> <li>▪ Emergency numbers for local police and fire department etc. must be placed in a prominent area.</li> <li>▪ Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.</li> <li>▪ Suitable conspicuous warning signs in English and all other applicable languages must be placed at all entrances to the site.</li> <li>▪ All speed limits must be adhered to on site</li> </ul>		
<p><b>Construction equipment safety</b></p> <ul style="list-style-type: none"> <li>▪ All equipment used for construction, including drills, TLBs must be in good working order with up to date maintenance records.</li> </ul>		
<p><b>Hazardous material storage</b></p> <ul style="list-style-type: none"> <li>▪ Staff that will be handling hazardous materials must be trained to do so.</li> <li>▪ Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor.</li> <li>▪ All storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</li> <li>▪ Material Safety Data Sheets (MSDS) which contain the necessary information pertaining to a specific hazardous substance must be present for all hazardous materials stored on the site.</li> <li>▪ The bund walls for the transformer oil containers must be in place before the installation of these containers.</li> <li>▪ The provisions of the Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to. This applies to solvents and other chemicals possibly used in the construction time.</li> </ul>		
<p><b>Procedure in the event of a petrochemical spill</b></p> <ul style="list-style-type: none"> <li>▪ The individual responsible for or who discovers the petrochemical spill must report the incident to the Project Manager.</li> <li>▪ The problem must be assessed and the necessary actions required will be undertaken.</li> <li>▪ The immediate response must be to contain the spill.</li> <li>▪ The source of the spill must be identified, controlled, treated or removed wherever possible.</li> </ul>		
<p><b>Fire management</b></p> <ul style="list-style-type: none"> <li>▪ A Fire Management Strategy must be compiled and implemented.</li> <li>▪ All construction personnel must receive training on fire hazards and techniques to extinguish any fire that may be initiated on the site.</li> <li>▪ They must also be made aware of the added risks during the dry summer months, as well as of the Fire Management Strategy to be implemented during construction.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Firefighting equipment must be present on site at all times as per OHSA.</li> <li>▪ All construction staff must be trained in fire hazard control and firefighting techniques.</li> <li>▪ All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.</li> <li>▪ There must be a (recommended 5m) firebreak around the construction site.</li> <li>▪ No open fires must be allowed on site.</li> <li>▪ No fires must be allowed adjacent to the boundary fence, either inside or outside the construction site.</li> <li>▪ Smoking may only be conducted in demarcated areas.</li> <li>▪ Any welding or other sources of heating of materials must be done in a controlled environment, wherever possible and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff.</li> <li>▪ The Contractor must take reasonable and active steps to avoid increasing the risk of fire through his activities on site. Accidental fires must be prevented through proper sensitisation of employees towards the associated risks, dangers and damage of property.</li> <li>▪ Ensure that an emergency preparedness plan is in place in order to fight accidental veld fires should they occur. The adjacent land owners/users/managers must also be informed and/or involved.</li> </ul>		
<p><b>Safety of surrounding residents</b></p> <ul style="list-style-type: none"> <li>▪ All I&amp;APs must be notified in advance of any known potential risks associated with the construction site and the activities on it. Examples of these are: <ul style="list-style-type: none"> <li>○ Blasting.</li> <li>○ Earthworks / earthmoving machinery on steep slopes above houses / infrastructure.</li> <li>○ Risk to residence along haulage roads / access routes.</li> </ul> </li> </ul>		
<b>8.2.26 Security</b>		
<ul style="list-style-type: none"> <li>▪ Access to the construction site must be strictly controlled by a security company.</li> <li>▪ 24 hour security on-site.</li> <li>▪ Labour must be transported to and from the site to discourage loitering in adjacent areas and possible increase in crime or disturbance.</li> <li>▪ Unsocial activities such as unauthorised consumption or illegal selling of alcohol, drug utilisation or selling and prostitution on site must be banned. Any persons found to be engaged in such activities must receive disciplinary or criminal action taken against them.</li> <li>▪ A site camp may be required as temporary housing for workers during construction. Only construction workers must be permitted to reside in the temporary camp.</li> <li>▪ The site must be fenced to prevent any loss or injury to persons or livestock during the construction phase.</li> <li>▪ If any fencing interferes with the construction process, such fencing must be deviated until construction is completed. The deviation of fences must be negotiated and agreed with the landowner in writing.</li> <li>▪ No alcohol / drugs to be present on site.</li> <li>▪ No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).</li> <li>▪ No harvesting of firewood from the site or from the residential and business properties adjacent to it.</li> <li>▪ Construction staff must make use of the facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bus as a toilet facility is forbidden).</li> <li>▪ Trespassing on private / commercial properties adjoining the site is forbidden.</li> </ul>	Contractor, ELO	Weekly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Driving under the influence of alcohol is prohibited.</li> <li>▪ All employees must undergo the necessary safety training and wear the necessary protective clothing.</li> <li>▪ Secure the site in order to reduce the opportunity for criminal activity in the locality of the construction site.</li> </ul>		
<b>8.2.27 Social Environment</b>		
<ul style="list-style-type: none"> <li>▪ All contact with the affected parties must be courteous at all times. The rights of the affected parties must be respected at all times.</li> <li>▪ A complaints register must be kept on site. Details of complaints must be incorporated into the audits as part of the monitoring process. This must be in carbon copy format, with numbered pages. Any missing pages must be accounted for by the Contractor. This register is to be tabled during monthly site meetings.</li> <li>▪ During the setup phase of the project the Contractor must make contact with those people that are interested in or affected by the development (I&amp;APs). The contractor must notify adjacent neighbours and inform them of the intended development. He must also inform neighbours that a complaints register will be available on site.</li> <li>▪ No interruptions other than those negotiated must be allowed to any essential services. Damage to infrastructure must not be tolerated and any damage must be rectified immediately by the Contractor. A record of any damage and remedial actions must be kept on site.</li> <li>▪ All existing private access roads used for construction purposes, must be maintained at all times to ensure that the local people have free access to and from their properties. Speed limits must be enforced in such areas and all drivers must be sensitised to this effect.</li> <li>▪ Any possible disruptions to essential services must be kept to a minimum and must be well advertised and communicated to the Landowners and surrounding Communities. Care must be taken not to damage irrigation equipment, lines, channels and crops, as this could lead to major claims being instituted against the Developer and the Contractor. The position of all pipelines and irrigation lines in the vicinity of a site must be obtained from the Landowners or local Community and clearly marked. Where required such lines shall be deviated.</li> </ul> <p><b>Areas near residences</b></p> <ul style="list-style-type: none"> <li>▪ Construction activities close to residential homes must be restricted to working hours to cause minimal disruption to local movement patterns, i.e. between the hours of 8am and 5pm.</li> <li>▪ Inform landowners of the construction process so that they are prepared for the construction activities to follow.</li> <li>▪ Consult with landowners in the event that extreme construction activities, such as blasting, would have to take place. Agree on a certain date and time with the property owners for such activities to take place.</li> <li>▪ Damage caused to housing structures as a result of blasting should be repaired as soon as possible.</li> <li>▪ Implement traffic flow controls where road closure or partial road closure is unavoidable. This can either be in the form of providing alternative access routes via detours and/or the use of 1-way traffic flow control.</li> <li>▪ In the event of 1-way traffic flow control, trained personnel should be used to regulate the traffic to prevent severe delays at waiting points.</li> </ul> <p><b>Roads</b></p> <ul style="list-style-type: none"> <li>▪ Road rehabilitation must take place during and once construction is completed.</li> <li>▪ Construction traffic must only make use of an approved route.</li> <li>▪ The number of trucks that pass through communities must be kept to a</li> </ul>	Developer, Contractor ECO, ELO,	Bi-Monthly

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>minimum and must be restricted to certain times of the day, i.e. avoid peak hours when community members are on their way to or from school and work.</p> <ul style="list-style-type: none"> <li>▪ Traffic signs must warn construction vehicles of the presence of pedestrians and school children along the road.</li> <li>▪ General road rules must be enforced.</li> <li>▪ Implement traffic flow controls where road closure or partial road closure is unavoidable. This can either be in the form of providing alternative access routes via detours and/or the use of 1-way traffic flow control.</li> <li>▪ In the event of 1-way traffic flow control, trained personnel should be used to regulate the traffic to prevent severe delays at waiting points.</li> </ul> <p><b>Railways</b></p> <ul style="list-style-type: none"> <li>▪ The railway line must be secured to prevent any potential damage to the railway line.</li> <li>▪ Any damage that occurs as a result of the construction activities must be rehabilitated according to the original specifications.</li> <li>▪ Placing any construction material on the railway line must be avoided at all costs to ensure a safe passage way for trains during construction.</li> <li>▪ Construction workers must be made aware of the fact that it is a live railway line and that they should take the necessary precautions when in close proximity and/or when crossing the railway line.</li> </ul> <p><b>Relocation of households and/or population segments</b></p> <ul style="list-style-type: none"> <li>▪ Avoid the resettlement and/or displacement of households as far as possible.</li> <li>▪ If resettlement is unavoidable, residents must be sufficiently compensated and assisted with the relocation process.</li> <li>▪ A form of compensation must also be granted to individuals who are residing in informal settlements within the proposed site.</li> <li>▪ A formal grievance procedure must be implemented and communicated to landowners to ensure a fair and transparent process.</li> </ul> <p><b>Influx of job seekers</b></p> <ul style="list-style-type: none"> <li>▪ Ensure that employment procedures / policy are communicated to local stakeholders, especially community representative organisations and ward councillors.</li> <li>▪ Have clear rules and regulations for access to the camp / site office to control loitering. Consult with the local SAPS to establish standard operating procedures for the control and/or removal of loiterers at the construction site.</li> <li>▪ Construction workers must be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags.</li> </ul> <p><b>Outflow of labourers</b></p> <ul style="list-style-type: none"> <li>▪ Implement methods (posters, talks, etc.) to create HIV and STI awareness amongst construction workers.</li> <li>▪ Develop skills transfer plans (e.g. portable skills training) that would enable a worker to move from one project to another project within the same area.</li> <li>▪ Payment must comply with applicable Labour Law legislation in terms of minimum wages.</li> <li>▪ Where local labourers are employed on a more permanent basis, cognisance must be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as you earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the worker's position on the construction team has either become redundant or once the construction phase comes to an end.</li> </ul> <p><b>Compensation for servitude</b></p> <ul style="list-style-type: none"> <li>▪ Compensation (not necessarily in the form of monetary compensation) to individuals who are residing in informal settlements within the servitude should be considered. However, this issue must be approached with caution as this</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>might set a precedent for future projects (people might deliberately move onto the servitude for the purpose of receiving compensation).</p> <ul style="list-style-type: none"> <li>▪ The land valuator must be experienced in evaluating the land in question, e.g. game farms.</li> <li>▪ The process must be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in “empty promises”).</li> <li>▪ The negotiation must be done for the whole servitude and not part of the servitude.</li> <li>▪ Contracts must be reviewed by an independent body.</li> <li>▪ Land owners must be made aware that a pre- and post-evaluation of their land value is possible.</li> </ul> <p><b>Direct formal employment opportunities for local individuals</b></p> <ul style="list-style-type: none"> <li>▪ Unskilled job opportunities must be afforded to local community members. Local trade unions could assist with the recruitment process to counteract the potential for social mobilisation.</li> <li>▪ Equal opportunities for employment must be created to ensure that the local female population also have access to these opportunities. Females must be encouraged to apply for positions.</li> <li>▪ Individuals with the potential to develop their skills must be afforded training opportunities. ACWA Power SolAfrica CSP Power Plant (Pty) Ltd (<a href="#">RF</a>) must be involved in this process.</li> <li>▪ Mechanisms must be developed to provide alternative solutions for creating job security upon completion of the project. This could include formal and/or informal training on how to look for alternative employment, information on career progression, etc. to ensure that people are equipped to seek other jobs with the skills that they have gained.</li> <li>▪ Payment must comply with applicable Labour Law legislation in terms of minimum wages.</li> <li>▪ Where local labourers are employed on a more permanent basis, cognisance must be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as you earn (PAYE), workman’s compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the worker’s position on the construction team has either become redundant or once the construction phase comes to an end.</li> </ul> <p><b>Indirect formal and/or informal employment opportunities for local individuals</b></p> <ul style="list-style-type: none"> <li>▪ Develop a procurement policy that is easy to understand and ensure that local subcontractors also comply with the procurement policy and any other applicable policies.</li> <li>▪ Ensure that local subcontractors receive the necessary support in terms of resources.</li> <li>▪ Agree on specific performance criteria prior to appointment.</li> <li>▪ Identify the segment that might benefit from informal indirect opportunities, and assist them with skills development and subsidise initiatives that are sustainable.</li> <li>▪ Encourage construction workers to use local services.</li> <li>▪ Consider housing construction workers in local communities.</li> </ul> <p><b>Attitude formation towards the project</b></p> <ul style="list-style-type: none"> <li>▪ Transparent information must be supplied to the community from the outset of the project.</li> <li>▪ The local community must play an active participatory role in the planning process, especially landowners of neighbouring properties. This could be achieved by means of establishing a community forum that meet quarterly or once a month to discuss issues and progress surrounding the project.</li> <li>▪ Employment opportunities must first be offered to the local community if the</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>skills are available within the community.</p> <ul style="list-style-type: none"> <li>▪ ACWA Power SolAfrica CSP Power Plant (Pty) Ltd (RF) should deliver on their undertakings with the community in terms of employment creation, etc. (tangible benefits to the community).</li> <li>▪ The undertakings in the EMPr must also be implemented effectively and with due diligence.</li> </ul> <p><b>Additional demand on municipal services</b></p> <ul style="list-style-type: none"> <li>▪ Construction workers must be made aware of the limited capacity of the municipal services network.</li> <li>▪ Negotiations with the affected local municipalities must be conducted and “demand-side management” should be implemented.</li> <li>▪ Construction camps must be located away from areas of concern.</li> </ul> <p><b>Disaster Management Plan</b></p> <ul style="list-style-type: none"> <li>▪ Develop and implement a disaster management plan for implementation during the construction phase.</li> <li>▪ Identify suitable individuals that can be trained and used as first aid officers on site (levels 1 to 3). Training of these individuals must ideally take place during this phase of the project to ensure that qualified first aid officers are on site once construction commences.</li> <li>▪ Consult with private ambulance services and/or hospitals so that they are aware of the project and would be able to provide emergency and/or medical services if needed.</li> <li>▪ Integrate risk management programmes with the IDP.</li> <li>▪ Maintain risk-specific safety infrastructure and plans – such as major accidents involving aircraft, railways and roads.</li> <li>▪ Establish a fully functional and equipped disaster management centre for the CSP and <u>PV Augmentation</u> plant.</li> <li>▪ Establish disaster prevention programmes that focus on the most vulnerable communities – and, at the same time, support sustainable livelihoods.</li> <li>▪ Establish and maintain fire protection on the urban fringe.</li> <li>▪ Establish a culture of scientific risk analysis by investigating possible risk scenarios and developing standard operating procedures for such scenarios.</li> <li>▪ Establish and maintain multi-disciplinary co-operation and cooperative partnerships.</li> <li>▪ Establish pro-active media liaison.</li> <li>▪ Educate and inform surrounding communities and/or households on the standard operating procedures to follow during a suspected leak or other accidents. Ensure that these communities and/or households know who to contact in case of an emergency and are able to implement a step-by-step disaster management procedure.</li> <li>▪ The way in which the disaster management plan is communicated to the surrounding communities and/or households must be jargon-free and outline an easy to follow step-by-step procedure. Cognisance must be taken of the fact that some members of the surrounding communities and/or households are illiterate – make use of alternative communication methods (e.g. picture posters) to educate and inform these individuals.</li> <li>▪ Pipeline markers must indicate the exact location of the pipeline to ensure that community members can evacuate the specific area in case of an emergency.</li> <li>▪ Where possible, pipeline markers must display the emergency contact number.</li> <li>▪ The proposed Solar Thermal Plant and <u>PV Augmentation</u> site must be fenced and access restricted.</li> </ul> <p><b>Pollution and fire risk</b></p> <ul style="list-style-type: none"> <li>▪ Sufficient portable chemical toilets on site and at the construction village.</li> <li>▪ Refuse on site must be discarded in sealed bins and/or covered skips. Refuse must be removed from the site on regular intervals (at least once a week) and disposed of at an approved waste disposal site.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Contractors are liable for the costs involved with connecting to the electricity network and the water services network.</li> <li>▪ Construction workers must only be allowed to make fire in designated areas. Construction workers who do not keep within designated areas must be fined.</li> </ul> <p><b>Sanitation</b></p> <ul style="list-style-type: none"> <li>▪ Construction workers must be treated for worms.</li> <li>▪ Adequate water facilities must be provided.</li> <li>▪ Sufficient portable chemical toilets on site and at the construction village.</li> </ul> <p><b>Sense of place</b></p> <ul style="list-style-type: none"> <li>▪ From a social perspective alternative route alignments passing through residential areas are not preferred. Where technically feasible, these areas must be avoided at all costs.</li> <li>▪ Sufficient and transparent information must be supplied to neighbouring properties to enhance their sense of safety and thereby reducing the negative impact on sense of place.</li> </ul> <p><b>Integration with local community</b></p> <ul style="list-style-type: none"> <li>▪ An aggressive STI and HIV/AIDS awareness campaign must be launched, which is not only directed at construction workers but also at the community as a whole.</li> <li>▪ Condoms must be distributed by placing them at centrally located points and by ensuring that construction workers and community members are aware of the availability and location of condoms. The distribution of condoms must be approached with the necessary cultural sensitivity.</li> <li>▪ Access at the construction site must be controlled to prevent sex workers from either visiting and/or loitering at the construction camp.</li> <li>▪ Local women must be empowered. This could be achieved by employing them to work on the project, which in turn would decrease their (financial) vulnerability.</li> </ul> <p><b>Physical splintering</b></p> <ul style="list-style-type: none"> <li>▪ Provide a safe passage way for community members to minimise the impact on movement patterns.</li> <li>▪ Fence off the construction site to prohibited unauthorised access by community members, thereby placing themselves in potential unnecessary danger.</li> <li>▪ Community awareness on the safety mechanisms of the CSP and <u>PV Augmentation</u> plant and related infrastructure, and the potential dangers.</li> <li>▪ Such an awareness campaign must be based on and address Frequently Asked Questions (FAQs) regarding a pipeline, e.g. is it safe to walk over a pipe?</li> <li>▪ The awareness campaign must also focus on standard operating procedures when there is a breakdown on the CSP and <u>PV Augmentation</u> plant, e.g. people should steer clear of the area, who to contact, etc.</li> <li>▪ A clear emergency evacuation plan must be developed in close co-operation with the affected local municipalities (also see section on disaster management plan).</li> </ul> <p><b>Third party tampering</b></p> <ul style="list-style-type: none"> <li>▪ Conduct a vulnerability assessment to identify essential portions and dimensions of the proposed project that is particularly vulnerable to wilful damage.</li> <li>▪ Ensure that physical security systems and emergency tactical response measures are adequate and effective.</li> <li>▪ Increase random aerial and ground surveillance of the entire length of the pipeline or sections thereof.</li> <li>▪ Fence off and control access to pump stations and other key facilities on the pipeline.</li> </ul> <p><b>Tourism Potential</b></p> <ul style="list-style-type: none"> <li>▪ Visual screening would reduce the visibility of the CSP and <u>PV Augmentation</u></li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
plant, if possible. <ul style="list-style-type: none"> <li>▪ Consider opening the CSP and <u>PV Augmentation</u> plant to visitors on certain days/times. This could also serve as an educational tool, to inform visitors on the safety and workings of an operational power plant. This way the CSP and <u>PV Augmentation</u> plant could enhance the tourism industry in the area.</li> </ul>		
<b>8.2.28 Visual Impact</b>		
<ul style="list-style-type: none"> <li>▪ Soften impact by use of landscaping, planting trees</li> <li>▪ Fencing of the site will also aid in reducing the visual impact of construction.</li> <li>▪ Cluster construction activities on site. Storage facilities, elevated tanks and other temporary structures on site should be located such that they have as little visual impact on local residents as possible.</li> <li>▪ Material chosen to blend in with the surrounding environment</li> <li>▪ Unwanted material and litter should be removed on a frequent basis</li> <li>▪ Cordon off construction site with shade-cloth if necessary.</li> <li>▪ Lighting must be subtle and not disturb passing motorists and surrounding residents.</li> <li>▪ Lighting must be inward and downward facing.</li> <li>▪ The site must be kept visually and aesthetically pleasing, especially in and around the Contractor camp. The ECO shall regularly inspect the site to ensure that it is neat and clean.</li> <li>▪ Where required the campsite must be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. Screening can be done by the use of shade cloth.</li> <li>▪ The exterior design in terms of buildings, fences and landscaping must be planned in such a way that it will not distract travellers from visiting the site.</li> <li>▪ An information centre is advisable which could explain the technology and inform visitors of the advantages of solar power.</li> <li>▪ Reduce the construction period through careful planning and productive implementation of resources.</li> <li>▪ Restrict the activities and movement of construction workers and vehicles to the immediate construction site.</li> <li>▪ Ensure that the general appearance of construction activities, construction camps (if required) and lay-down areas are maintained by means of the timely removal of rubble and disused construction materials.</li> <li>▪ Restrict construction activities in populated places to daylight hours (where possible) in order to negate or reduce the visual impacts associated with lighting.</li> </ul>	Contractor, ELO, ECO	Monthly
<b>8.2.29 Cultural and Heritage Artefacts</b>		
<ul style="list-style-type: none"> <li>▪ Any findings must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA.</li> <li>▪ Local museums as well as the South African Heritage Resource Agency (SAHRA) must be informed if any artefacts are uncovered in the affected area.</li> <li>▪ The contractor must ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.</li> <li>▪ Any discovered artefacts must not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits must be obtained from the South African Heritage Resources Association (SAHRA) should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.</li> <li>▪ Should any archaeological sites be uncovered during construction, their</li> </ul>	Contractor, ECO, ELO	Monthly





ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
existence must be reported to the Contractor and the ECO immediately.		

### 8.3 Operational Phase

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.3.1 Construction Site Decommissioning</b>		
<b>Removal of equipment</b> <ul style="list-style-type: none"> <li>▪ All structures comprising the construction camp must be removed from site except for the operational and maintenance purpose.</li> <li>▪ The area that previously housed the construction camp must be checked for spills of substances such as oil, paint, etc., and these must be cleaned up.</li> <li>▪ All hardened surfaces within the construction camp area must be ripped, all imported materials removed, and the area must be top soiled and regressed using the guidelines as set out in the section on Flora and Fauna that forms part of this document.</li> </ul>	Contractor, Developer, ECO, ELO	Weekly
<b>Temporary services</b> <ul style="list-style-type: none"> <li>▪ The Contractor must arrange the cancellation of all temporary services.</li> <li>▪ A copy of all way bridge certificates from waste disposed must be presented to the ECO.</li> <li>▪ Temporary roads must be closed and access across these blocked.</li> <li>▪ All areas where temporary services were installed must be rehabilitated to the satisfaction of the ECO.</li> </ul>		
<b>Associated infrastructure</b> <ul style="list-style-type: none"> <li>▪ Surfaces must be checked for waste products from activities such as concreting or asphaltting and cleared in a manner approved by the Engineer.</li> <li>▪ All surfaces hardened due to construction activities must be ripped and imported material thereon removed.</li> <li>▪ All rubble must be removed from the site to an approved disposal site as approved by the Engineer. Burying of rubble on site is prohibited.</li> <li>▪ The site must be cleared of all litter.</li> <li>▪ The Contractor must check that all watercourses are free from building rubble, spoil materials and waste materials.</li> <li>▪ Fences, barriers and demarcations associated with the construction phase must be removed from the site unless stipulated otherwise by the Engineer.</li> <li>▪ All residual stockpiles must be removed to spoil or spread on site as directed by the Engineer.</li> <li>▪ All leftover building materials must be returned to the depot or removed from the site.</li> <li>▪ The Contractor must repair any damage that the construction works has caused to neighbouring properties, specifically, but not limited to, damage caused by poor storm water management.</li> </ul>		
<b>Borrow pits</b> <ul style="list-style-type: none"> <li>▪ Borrow pits must be closed and rehabilitated.</li> </ul>		
<b>8.3.2 Water Management</b>		
<b>Surface water</b> <ul style="list-style-type: none"> <li>▪ Correct drainage of the site must ensure that contaminants do not impact upon surface water resources. No sensitive surface water features are present on the site.</li> </ul>	Developer	Bi-Annually
<b>Management</b> <ul style="list-style-type: none"> <li>▪ Management must ensure that solid waste collection and sanitation is managed effectively in order to avoid any chances of ground and surface water pollution.</li> <li>▪ All runoff water from fuel deposits, workshops, vehicles washing areas and other equipment must be collected and directed through oil traps to settlement</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>ponds. These ponds must be suitably lined.</p> <ul style="list-style-type: none"> <li>▪ All water discharged from the works including effluent from wash water and stormwater from workshops and refuelling areas, as well as all runoff from areas with pollution potential will comply with national effluent standards.</li> <li>▪ All chemical/hydrocarbon storage areas must be bunded. This bund water must be removed from site by a licensed contractor.</li> <li>▪ All plant and chemical usage areas must be paved.</li> <li>▪ Potentially contaminated water must be directed to an oil/water separator. Oily water must be removed from the site by a licensed contractor.</li> <li>▪ Any run-off that is discharged from the site must be uncontaminated.</li> <li>▪ All vehicle transfers of materials must be conducted within a bunded area to minimise the potential for spills to enter the stormwater.</li> <li>▪ Spills of potential contaminants must be immediately cleaned up and neutralised. Such spills must be handled with consideration to health and safety considerations.</li> <li>▪ <u>A procedure for dealing with accidental spills must be established and be approved by the Plant General Manger. The procedure must distinguish between those spills that can be cleaned up by the Contractor and those that will require specialist input. The name and contact numbers of various clean up companies must be visible displayed in all areas of concern. This procedure must also include a provision to notify the relevant competent authorities of any spills.</u></li> <li>▪ <u>The Operations Manager must ensure that the necessary materials, equipment and chemicals are available on site to deal with spills of any of the hazardous materials present on site.</u></li> <li>▪ The use of water to clean up spills must be avoided except where absolutely necessary.</li> <li>▪ Movement of vehicles on and off site is to be through approved access points only.</li> <li>▪ Spill kits must be made available on site for the clean-up of spills and leaks of contaminants.</li> <li>▪ <u>Drip trays must be placed in areas susceptible to leaks and spills.</u></li> <li>▪ <u>Drip trays must be examined weekly for any signs of deterioration.</u></li> <li>▪ <u>Ventilation systems, pumps to evaporation ponds must be inspected weekly.</u></li> <li>▪ Spill response procedures to include removal/disposal of potentially contaminated water and any used absorbent materials.</li> <li>▪ In the event of a major spill or leak of contaminants, the administering authority must be contacted immediately as per incident reporting procedures.</li> <li>▪ No ground water or surface water must be polluted by any activities on site.</li> <li>▪ Should any negative effects on the supply of groundwater to neighbouring users in the area become apparent these must immediately be reported to the DEA, NC DENC, DWS and the !Kheis Local Municipality.</li> </ul>		
<p><b>Stormwater</b></p> <ul style="list-style-type: none"> <li>▪ Any rehabilitation undertaken or future development must ensure that stormwater flows do not cause erosion to water courses in close proximity to the CSP <u>and PV Augmentation</u> plant and associated infrastructure. Accordingly excessive stormwater flows must not be directed into water courses.</li> </ul>		
<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>▪ No roads related to operational maintenance of the site must be constructed through watercourses.</li> </ul>		
<p><b>Monitoring and Reporting</b></p> <ul style="list-style-type: none"> <li>▪ A formal monitoring and reporting strategy/protocol must be developed for monitoring the integrity of the different water resources likely to be affected by the CSP <u>and PV Augmentation</u> plant. This must include any ongoing rehabilitation measures initiated in the construction phase.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<ul style="list-style-type: none"> <li>▪ Monitoring must include fixed-point photographs at specific intervals and after large flood events.</li> <li>▪ Specific activities that should be monitored include:</li> <li>▪ Erosion potential (specifically in and around roads and storm-water discharge points).</li> <li>▪ Stormwater management and design.</li> <li>▪ Water quality upstream and downstream of the pump station.</li> <li>▪ Identified problem areas.</li> <li>▪ Resource-directed measures and any other monitoring requirements as stipulated by <u>DWS</u> must be included in the monitoring programme.</li> <li>▪ It is recommended that the operational area of the power <u>plant</u> must be paved with concrete material which must be inspected on a regular basis for cracks and leaks.</li> <li>▪ It is further recommended that two monitoring/observation boreholes be drilled on site during the construction phase of the project. The existence of these boreholes will assist in the early detection of any leakage of contaminants into the groundwater system.</li> <li>▪ The optimum drilling positions for these boreholes must be selected by a professional hydrogeologist. It is important that the topographic setting, possible geological structures, etc. are considered during this phase.</li> <li>▪ Groundwater levels can be measured on a monthly basis and initial water quality samples can be collected and analysed for reference purposes. Thereafter on-going sampling of groundwater can be conducted on quarterly basis. The chemical analysis of water must include the following determinants: pH; Conductivity; Calcium (Ca); Magnesium (Mg); Sodium (Na); Potassium (K); Bicarbonate (HCO<sub>3</sub><sup>2-</sup>); Chloride (Cl); Sulphate (SO<sub>4</sub><sup>2-</sup>); Nitrate (NO<sup>3</sup>); Iron (Fe); Manganese (Mn).</li> <li>▪ <u>Waste water quality from the neutralisation pit must be measured on a monthly basis prior disposal to evaporation ponds. The chemical analysis of water must include the following determinants: Conductivity; Calcium (Ca); Magnesium (Mg); Chloride (Cl); Sulphate (SO<sub>4</sub><sup>2-</sup>); Sodium (Na) and Total Dissolved Solids (TDS).</u></li> <li>▪ <u>Monthly sampling from detection wells located next to the South and South-West of the ponds must also be conducted monthly for early detection of the contamination before it reaches Orange River.</u></li> </ul>		
<b>8.3.3 Air Quality</b>		
<p><b>Dust management</b></p> <ul style="list-style-type: none"> <li>▪ Dust control mechanisms must be utilised to reduce the amount of dust being released.</li> <li>▪ Any dirt roads that are utilised by the contractor to access the site must be regularly maintained to ensure that dust levels are controlled.</li> <li>▪ The CSP <u>and PV Augmentation</u> plant's equipment must be performance tested during the commissioning phase to ensure that the manufacturer's standard has been delivered in respect of air emissions.</li> </ul>	Developer	Annually
<p><b>Gas leaks</b></p> <ul style="list-style-type: none"> <li>▪ <u>All gases to be used during operation will be stored in demarcated storage area, securely chained and regularly checked for any leaks. A visible signage will be displayed in demarcated storage area. Assembly points will be clearly identified with visible sign boards. A mock gas alarms will be tested quarterly.</u></li> <li>▪ <u>In case of accidental leak of gases; evacuation plan and procedure will be developed and relevant gas rooms will be used in case of emergencies.</u></li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.3.4 Fauna</b>		
<p><b>Fauna management</b></p> <ul style="list-style-type: none"> <li>▪ A monitoring programme must be developed to monitor the impacts of the construction of the CSP plant on Avifauna. This monitoring programme should be set up in conjunction with the DEA / NC DENC.</li> <li>▪ Monitor the movement of small and medium size mammals through fences. In the event that an animal becomes trapped within the facility, procedures need to be developed in order to facilitate their removal.</li> </ul>	Developer	Annually
<b>8.3.5 Noise</b>		
<p><b>Noise from the CSP plant and <u>PV Augmentation</u></b></p> <ul style="list-style-type: none"> <li>▪ The design of the CSP and <u>PV Augmentation</u> plant must incorporate all the necessary acoustic design aspects required in order that the overall generated noise level from the new installation does not exceed a maximum equivalent continuous daytime rating level (<math>L_{Req,d}</math>), namely a noise level of 70 dBA (just inside the property projection plane, namely the property boundary) as specified for industrial districts in SANS 10103. Notwithstanding this provision, the design must also take into account the maximum allowable equivalent continuous day/night rating level of the potentially impacted sites outside the new installation's property. Where the <math>L_{Req,d}</math> for the external site is presently lower than the maximum allowed, the maximum shall not be exceeded. Where the <math>L_{Req,d}</math> for the external site is presently at or exceeds the maximum, the existing <math>L_{Req,d}</math> must not be increased.</li> <li>▪ The latest technology incorporating maximum noise mitigating measures for the CSP and <u>PV Augmentation</u> plant components must be designed into the system.</li> <li>▪ The design process is to consider, inter alia, the following aspects: <ul style="list-style-type: none"> <li>a. The position and orientation of buildings on the site.</li> <li>b. The enclosure of noisy plant in buildings where possible and practical.</li> <li>c. The design of the buildings to minimise the transmission of noise from the inside to the outdoors.</li> <li>d. The insulation of particularly noisy plant and equipment.</li> </ul> </li> <li>▪ All plant and equipment, including vehicles, must be properly maintained in order to minimise noise generation.</li> <li>▪ Observation of on-site noise levels by Safety, Health and Environment Officer.</li> <li>▪ A complaints register must be held, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> <li>▪ Corrective action is required to be undertaken immediately after a complaint is made or non-conformance is identified.</li> <li>▪ Any complaints regarding noise must be investigated, sources identified and mitigation measures implemented. Feedback on resolution of the issue must be provided to the complainant.</li> <li>▪ The Safety, Health and Environment Officer will maintain an incident reporting system to record non-conformances.</li> </ul>	Developer	Annually
<b>8.3.6 Biodiversity</b>		
<ul style="list-style-type: none"> <li>▪ Indigenous vegetation must be maintained.</li> <li>▪ The active control of all alien invasive species by means of manual removal, ring-barking, chemical control or a combination of these methods.</li> <li>▪ The use of herbicides must be in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947).</li> </ul>	Developer	Monthly in rehabilitation phase, quarterly thereafter

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>In terms of this Act, a registered pest control operator will apply herbicides, or will supervise the application of herbicides.</p> <ul style="list-style-type: none"> <li>▪ The Developer must: <ul style="list-style-type: none"> <li>○ Ensure that a registered pest control operator applies or supervises the application of all herbicides.</li> <li>○ Ensure that all herbicides are stored in a well-ventilated demarcated storage area.</li> <li>○ Ensure that a register of all contents of the storage area is kept and updated on a regular basis.</li> <li>○ Ensure that a daily register of all relevant details of herbicide usage is kept, and that such a register is maintained by the Developer.</li> <li>○ All emergent seedlings must be removed by hand and re-sprouting from existing rootstock must be chemically treated in a continual monitoring and follow-up programme.</li> <li>○ Implementation of site rehabilitation and landscaping program.</li> <li>○ Where possible re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.</li> <li>○ Vegetative re-establishment shall, as far as possible, make use of indigenous or locally occurring plant varieties within a 20m radius of the site.</li> <li>○ Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas during and following rehabilitation.</li> </ul> </li> <li>▪ No faunal species must be harmed by maintenance staff during any routine maintenance at the site.</li> <li>▪ Appropriate mitigation of bird collisions with trough mirrors must be confirmed on an ad hoc basis through regular monitoring once the plant is operational.</li> <li>▪ The development and implementation of an avifauna impact monitoring programme.</li> <li>▪ <u>An operational monitoring programme should be implemented by an avifaunal specialist for the 4 MW PV facility to monitor for bird fatalities during the first year of operation.</u></li> <li>▪ <u>Results of this monitoring should then advise if further operational monitoring is needed.</u></li> <li>▪ <u>A single fence design should be utilised around the PV facility. The perimeter fence must be checked regularly (at least twice weekly) for trapped or stranded birds, which should then be assisted to escape.</u></li> <li>▪ <u>Site staff must be trained by an avifaunal specialist in the capture and handling of birds.</u></li> <li>▪ <u>All exposed electrical cabling and or power lines associated with the project must be adequately insulated to prevent bird electrocutions.</u></li> <li>▪ <u>Any new overhead powerlines must be fitted with bird flight diverters to reduce potential bird collisions.</u></li> <li>▪ Marking the relevant sections of the power line with appropriate marking devices. These sections of line must be identified as part of the EMP<sub>r</sub> phase, once the exact alignment is known.</li> <li>▪ Follow-up aquatic surveys are recommended to potentially identify emerging impacts following post-construction within both the aquatic and riparian areas. This is important so as to implement any further mitigatory measures required for emerging problems (e.g. soil erosion forming through poor stormwater management feature design, recruitment of exotic vegetation, formation of in stream migratory barriers, etc). The appointed ECO must be well-versed in identifying potential emerging environmental concerns.</li> </ul>		

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.3.7 Waste Management</b>		
<p><b>Waste management (if applicable)</b></p> <ul style="list-style-type: none"> <li>▪ Solid waste separation and recycling must take place for the duration of the operational phase for the development.</li> <li>▪ All structures and/or components replaced during maintenance activities are appropriately disposed of at an appropriate licensed waste disposal site or sold to a recycling merchant for recycling.</li> <li>▪ Ensure that care is taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation.</li> <li>▪ Waste handling, collection and disposal operations are managed and controlled by a waste management contractor</li> </ul> <p><b>Wastewater:</b></p> <ul style="list-style-type: none"> <li>▪ Water from bunds and oily water from oil/water separator must be removed by a licensed contractor.</li> </ul> <p><b>Waste – Leaked oil and chemicals:</b></p> <ul style="list-style-type: none"> <li>▪ Appropriate disposal must be arranged with a licensed facility.</li> <li>▪ Waste must be stored and handled according to the relevant legislation and regulations.</li> </ul> <p><b>General Waste:</b></p> <ul style="list-style-type: none"> <li>▪ Recycled where possible or disposed of properly to an appropriate landfill facility.</li> </ul> <p><b>Hazardous Waste:</b></p> <ul style="list-style-type: none"> <li>▪ Separate hazardous and general waste and dispose hazardous waste to an appropriate hazardous waste disposal site.</li> <li>▪ <u>Hazardous Waste storage facility must be kept tidy.</u></li> <li>▪ <u>Provide proper warning signage to make people aware of the activities within the storage facility.</u></li> <li>▪ <u>This containment facility should be checked and maintained at all times.</u></li> <li>▪ <u>Any hazardous waste temporarily kept in the storage area must be clearly marked and stored in such a way that it does not pose danger to the user or surrounding environment.</u></li> <li>▪ <u>Firefighting equipment must be easily accessible in the storage area and all employees must be familiar with the protocol in the event of fire occurring on site and emergency assembly point must be clearly identified.</u></li> <li>▪ Uncontaminated waste must be removed at least monthly for disposal.</li> <li>▪ Contaminated or regular wastes must be disposed of as necessary and in accordance with legislation.</li> <li>▪ An incident/complaint register must be established and maintained.</li> <li>▪ Visual inspection of the site must be carried out daily for evidence of litter or waste material that has been inappropriately disposed of by site personnel</li> <li>▪ Waste collection must be monitored on a regular basis</li> <li>▪ Waste documentation must be completed and available for inspection on request</li> <li>▪ A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> <li>▪ Weekly and monthly reports on exact quantities of all waste streams exiting the site must be compiled by the waste management contractor and monitored by the Safety, Health and Environment Officer. All appropriate waste disposal certificates accompany the monthly reports.</li> </ul>	Developer	Monthly when conduction / and or maintenance is required

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.3.8 Health and Safety</b>		
<p><b>Emergency evacuation plan</b></p> <ul style="list-style-type: none"> <li>▪ Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency.</li> <li>▪ All permanent staff must undergo safety training.</li> <li>▪ <u>Every person entering the site must undergo safety induction training.</u></li> </ul>		
<p><b>Maintenance</b></p> <ul style="list-style-type: none"> <li>▪ The water pipeline and power line must be regularly maintained. A maintenance schedule must be drawn up and records of all maintenance kept.</li> </ul>		
<p><b>Fire safety</b></p> <ul style="list-style-type: none"> <li>▪ Firefighting equipment in the form of fire hydrants or fire extinguishers must be available on the site. These must be regularly maintained by an appropriate company.</li> <li>▪ All firefighting equipment inspections must be conducted as per planned maintenance schedule.</li> </ul>		
<p><b>Storage and handling and management of hazardous materials</b></p> <ul style="list-style-type: none"> <li>▪ Management strategies/operational procedures for the routine monitoring and inspection of fuel tanks, and other fuel related equipment must be compiled and implemented.</li> <li>▪ The storage of flammable and combustible liquids such as oils will comply with the relevant legislation.</li> <li>▪ The storage and handling of corrosive substances must be in accordance with the relevant legislation</li> <li>▪ The minimum amount of fuel required for efficient operation of the facility must be stored on site.</li> <li>▪ Any spills must be rendered harmless and arrangements made for appropriate collection and disposal, including cleaning materials, absorbents and contaminated solid in accordance with this EMP</li> <li>▪ Ensure that spill kits are available on site to clean up spills and leaks.</li> <li>▪ <b><u>Obtain any permits and approvals necessary and comply with the conditions attached to such permits and approvals</u></b></li> <li>▪ <b><u>Compliance with all the permits issued for the site.</u></b></li> <li>▪ Transport of all hazardous substances must be in accordance with the relevant legislation.</li> <li>▪ Identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This must include all fuels, oils, lubricants and grease.</li> <li>▪ Ensure that all hazardous substances are handled in accordance with the manufacturer's specifications and relevant legal requirements.</li> <li>▪ Store all hazardous substances in a manner prescribed in the relevant Acts and Regulations (e.g. in a well-ventilated area).</li> <li>▪ <u>Material Safety Data Sheets (MSDS) for on-site chemicals, hydrocarbon materials and / or waste and hazardous substances must be readily available. MSDS's must include information pertaining to environmental impacts and measures to minimize and mitigate against any potential environmental impacts which may result from a spill.</u></li> <li>▪ Arrange and supervise the implementation of clean-up operations and proper disposal of contaminated materials at a licensed hazardous waste disposal site.</li> <li>▪ Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean-up of the spill. Such progress reporting is important for monitoring and</li> </ul>	Developer	Daily



ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences.</p> <ul style="list-style-type: none"> <li>▪ All tanks must be designed and constructed in accordance with a recognised code (international standard).</li> <li>▪ The rated capacity of tanks must provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage.</li> <li>▪ Tanks must be situated in a bunded area the volume of which must be at least 110% of the proposed volume of the tank.</li> <li>▪ The floor of the bunded area must be smooth and impermeable, constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The floor of the bunded area must be sloped towards an oil trap or sump to enable any spilled fuel and/or fuel –soaked water to be removed.</li> <li>▪ The fuel delivery area must be bunded and an interceptor system or similar structure must be installed, with all drainage directed to an oil water separator. This will allow for the removal of free product from any surface run-off or spillages. The interceptor system must contain a holding tank that is used to contain any free product recovered. Free product must be removed from this separator, stored in a holding tank, and recycled or disposed of in an appropriate manner.</li> <li>▪ Internationally approved non-corrosive pipework systems must be installed (approved codes).</li> <li>▪ Anti-flash nozzles must be installed at the end of the vent pipes and provisions must be made for overflow protection devices in the tank filling pipes to prevent tank overfills during filling operations.</li> <li>▪ Fuel must be dispensed via a system that has suitable leak detectors linked to the fuel lines if and where required. These leak detectors must form an integral part of the pumping system and allow for automatic cut-off of the fuel supply must a leak be detected.</li> <li>▪ Any water that collects in the bund must not be allowed to stand and must be removed and the hydrocarbon digestion agent within must be replenished.</li> <li>▪ Spill and emergency response equipment must be accessible at chemical transfer/unloading points and <u>refuelling</u> locations.</li> <li>▪ Bunds and storage facilities must be maintained to ensure design capacity is available.</li> <li>▪ Water which ponds within the bunded areas must be pumped to the oil/water separator as soon as possible after rain events cease.</li> <li>▪ Observation and supervision of chemical storage and handling practices and vehicle maintenance by the Safety, Health and Environment Officer throughout the CSP plant's operational phase.</li> <li>▪ Inspection of bunding integrity, stability and function.</li> </ul>		
<p><b>Hazard and Risk</b></p> <ul style="list-style-type: none"> <li>▪ All monitoring must occur according to the risk management and emergency response plan, guidelines and license conditions.</li> <li>▪ A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>		
<p><b>8.3.9 Visual impact</b></p>		
<ul style="list-style-type: none"> <li>▪ The CSP plant and its unique technology have the potential of becoming a tourist attraction. It is therefore recommended that the exterior design in terms of buildings, fences and landscaping be planned in such a way that it will not deter travellers from visiting the site.</li> <li>▪ All lighting where practical, must be “down” to minimise the visual impact of</li> </ul>	Developer	Annually

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<p>the facility at night. Lighting must be directed towards the areas they are supposed to illuminate.</p> <ul style="list-style-type: none"> <li>Use of light fixtures and the fitment of covers and shields designed to contain rather than spread light where practical. The minimum amount of lighting must be used.</li> <li>If a visually intrusive component of the site is identified, the procedures must be altered or updated to ensure effective management.</li> <li>An incident reporting system will record and manage follow up of resolution of non-conformances.</li> </ul>		
<b>8.3.10 Traffic and Access</b>		
<ul style="list-style-type: none"> <li>All drivers must be in possession of an appropriate valid driver's license.</li> <li>All maintenance vehicles travelling on public roads must adhere to the specified speed limits.</li> <li>Moderate speeds must be employed and adhered to on all roads within the CSP and PV Augmentation plant area.</li> <li>The movement of all vehicles must be controlled such that they remain on designated routes.</li> <li>No member of the workforce must be permitted to drive a vehicle under the influence of alcohol or narcotic substances.</li> <li>No deviation from approved access roads or transportation routes must be allowed.</li> <li>Appropriate security measures must be established with regards to access into the CSP and PV Augmentation plant.</li> <li>During fuel tanker delivery, the tanker driver and adequately qualified staff must be present at all times during product offloading.</li> <li>An emergency cut-off switch <u>if applicable</u> must be installed to immediately stop fuel delivery if an accident occurs.</li> <li>Tank filler points must be appropriately located.</li> </ul>	Developer	Daily

## 8.4 Decommissioning Phase

At this stage the date of decommissioning of the power plant is not known and is unlikely to occur within 25 - 30 years of the commencement of plant operations. The mitigation measures mentioned below are thus very generic and will be refined once the said activity is required.

ENVIRONMENTAL SPECIFICATION	RESPONSIBILITY	FREQUENCY
<b>8.4.1 Decommissioning</b>		
<ul style="list-style-type: none"> <li>It is not anticipated that there will be any impacts during this phase.</li> </ul>	Developer, Main contractor	Weekly for the duration of decommissioning

## 9 COMPLIANCE WITH THE ENVIRONMENTAL SPECIFICATION

The EMPr forms part of the Contract Documentation and is thus a legally binding document. It is also necessary for the contractor to make provisions as part of their budgets for the implementation of the EMPr. In terms of *Polluter Pays Principle*. Section 28 of the NEMA, an individual responsible for environmental damage must pay the costs for both environmental and human health damage. As far as possible preventative measures must be in place to reduce or prevent additional pollution and/or environmental damage from occurring.

The Contractor is deemed not to have complied with the Environmental Specification / EMPr if:

- There is evidence of contravention of clauses within the boundaries of the site, site extensions and haul / access roads;
- Environmental damage ensues due to negligence;
- The contractor ignores or fails to comply with corrective or other instructions issued by the Developer, ECO or Engineer within a specified time; or
- The contractor fails to respond adequately to complaints from the public.

### 9.1 Penalties

Application of a penalty clause will apply for incidents of non-compliance. The contractor will be allowed one offence and a written warning will be issued to the Contractor's SHE Officer. Failure to rectify the offence within one (1) working week of the issue of the warning or a repeat offence will result in a penalty.

The penalty will be issued by a representative of the Developer. The penalty imposed will be per incident at the discretion of the Developer's SHEQ Manager or any other duly authorised representative. The value of the penalty imposed must be as defined in the contract and enforcement must be at the discretion of the Developer. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the EMPr. The Developer will inform the contractor of the contravention and the amount of the penalty, and will deduct the amount from monies due under the Contract.

The penalty monies will become the property of the Developer to be used for rehabilitation and maintenance of the site. Unless stated otherwise in the project specification, the penalties imposed per incident or violations are outlined below in **Table 11**.

**Table 11: Penalties Applicable**

OFFENCE	AMOUNT
Failure to demarcate working areas	R10,000
Working outside of demarcated areas	R30,000
Failure to strip topsoil with intact vegetation	R50,000
Failure to stockpile topsoil correctly	R30,000
Failure to stockpile materials in designated areas	R10,000
Failure to take measures to prevent soil contamination	R10,000

OFFENCE	AMOUNT
Failure to take measures to control dust dispersion on-site	R10,000
Washing of vehicles on-site	R10,000
Pollution of water bodies and/or groundwater	R20,000
Failure to implement stormwater management provisions during construction	R20,000
Failure to control stormwater run-off	R30,000
Downstream erosion	R30,000
Failure to provide adequate sanitation	R10,000
Failure to erect temporary fences around trenches	R10,000
Failure to provide adequate waste disposal facilities and services	R50,000
Failure to reinstate disturbed areas within the specified time-frame	R30,000
Any other contravention of the project specific specification	R10,000

The Developer is responsible for the implementation of the EMPr and for compliance monitoring of the EMPr. The EMPr will be made binding on all contractors (including sub-contractors) operating on the site and will be included with the Contract. Non-Compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance. Non-compliance with the conditions of the EMPr constitutes a breach of Contract.

## 9.2 Removal from Site and Suspension of Works

Failure to remediate after the issue of a financial penalty, depending on the severity and significance of the impact related to non-compliance, the ECO may undertake to report directly to the Department of Environmental Affairs (Compliance) recommending that for:

- High impact: to issue a notice to cease construction;
- Medium impact: to issue a notice instructing the Developer to implement recommended remedial action; or
- Low impact: ECO to notify, but up to discretion of DEA to apply sanction.

The Developer, at the direction of the ECO, or of his own conviction, has the power to remove from site any person who is in contravention of the EMPr, and if necessary, the Developer can suspend part or the whole of the works, as required.



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