ENVIRONMENTAL IMPACT ASSESSMENT

PROPOSED KARIBIB 5MW SOLAR PV PALNAT AND ITS ASSOCIATED TRANSMISSION LINE TO THE NAMPOWER KARIBIB DISTRIBUTION SUBSTATION

JULY 2015

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List of Abbreviations

CDM	Clean Development Mechanism
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMA	Environmental Management Act
EMS	Environmental Management System
ESA	Environmental Scoping Assessment
I&Aps	Interested and Affected Parties
PPPPs	Projects, Plans, Programmes and Policies

GLOSSARY

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ALIEN INVASIVE PLANTS	Plants that do not naturally occur in an area. These plants are also referred to as exotic plants.
CONSTRUCTION ACTIVITY	Any action taken by the contractor, his sub-contractors, suppliers or personnel during the operational phase and possible decommissioning phase of the project
ENVIRONMENT	an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.
ENVIRONMENMTAL CONTROL OFFICER	An individual nominated through the Project Manager to be present on site to act on behalf of the Project Manager in matters concerning the implementation and day to day monitoring of the EMP.
ENVIRONMENTAL MANAGEMENT	A management process which seeks to ensure, as far as possible, that no avoidable impact is caused to the environment and that when this is unavoidable that the consequences are understood prior to the impact being caused and that the impact is then mitigated as far as possible.
GROUNDWATER	Water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations
HAZARDOUS WASTE	Waste that poses substantial or potential threats to public health or the environment.
MITIGATION	The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts.
NO-GO AREA	Areas where all construction activities and related matters are prohibited.
POLLUTION	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.
REHABILITATION	Restoring the disturbed area to more or less the natural set up.
SITE	An area of ground where the Solar Plant is to be constructed.

EXECUTIVE SUMMARY

MetDecci Energy Investment (Pty) Ltd hereafter often referred to as the proponent is of the intention to erect a 5MW solar photovoltaic(PV) plant in Karibib townlands, that will connect to the existing NAMPOWER substation in Karibib. The proposed solar plant is envisaged to put the power produced in the national grid, thus helping to reduce the current power demand in Namibia. The power plant is planned to be on 15,2Ha plot, although the actual plant will only occupy 6Ha of the total allocated land. The Solar PV Plant will have an associated 900m below ground transmission line. The generation of electricity, transmission and supply of electricity are 'listed activity' as per the 'List of Environmental activities' needing Environmental Clearance (Government Notice No.1 April 2008) and accordingly requires and Environmental Impact Assessment (EIA) to be conducted.

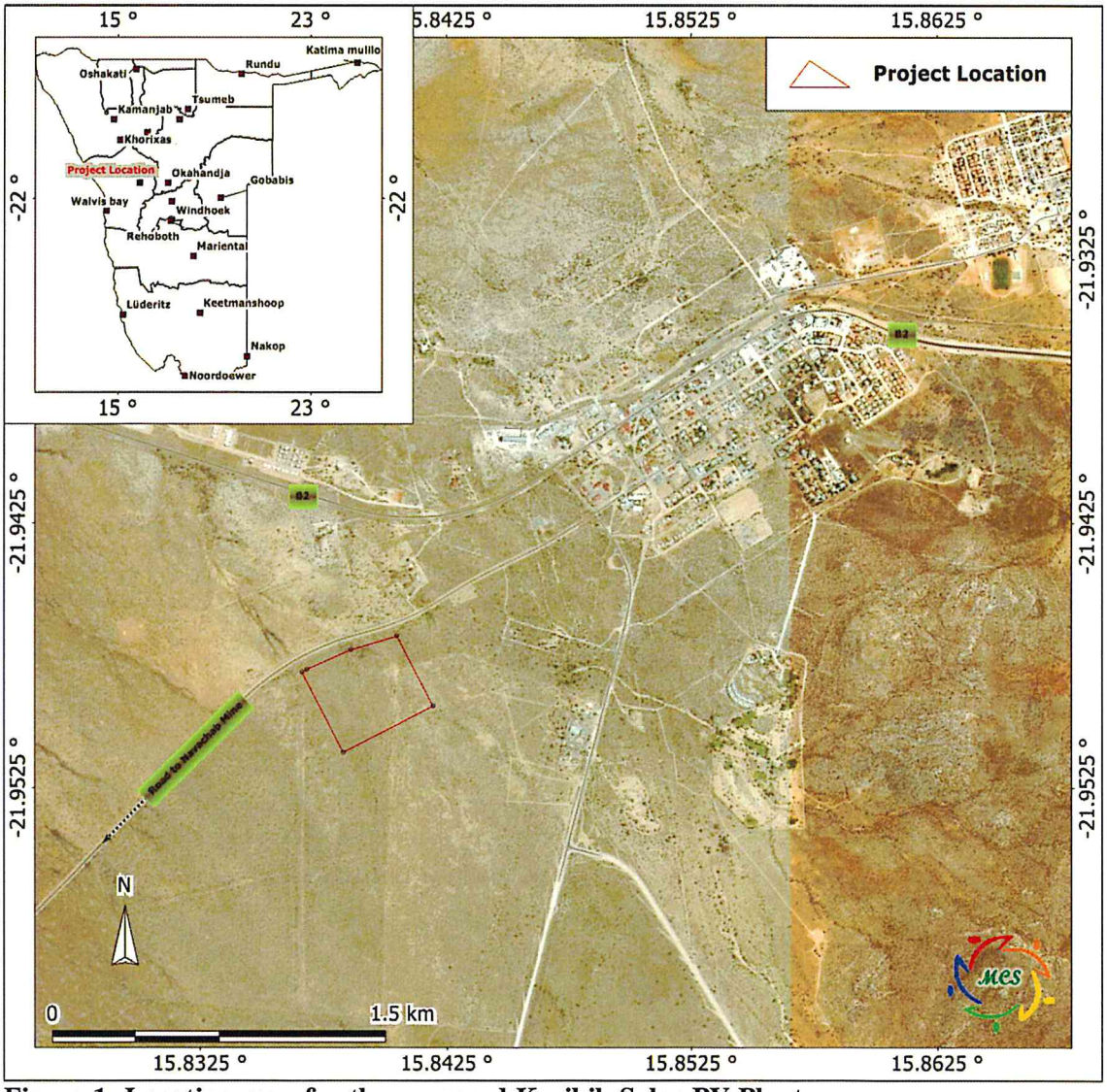

Figure 1. Location map for the proposed Karibib Solar PV Plant

The proponent commissioned this EIA and appointed Matrix Consulting Services to undertake the necessary activities to enable an application for an Environmental Clearance with the Environmental Commissioner as prescribed by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012).

The proposed project serves to cater for existing and future load growth by providing reliable power supply for the increasing economic developments in Karibib as a result of mines opening up within the surrounding areas and associated residential developments. Many people are migrating to the town mainly for employment purposes, this has elevated the power demand, and may cause power shortages or power failures in future. Therefore there is an urgent need to provide alternative power supply sources for the residents living in and around Karibib and Erongo Region at large to prevent any inconveniences or power outages that may arise thereof.

The proposed impacts that were pre-identified for the proposed project are:

- Noise emissions during construction
- Potential avifauna conflicts
- Removal/disturbance of fauna and flora
- Waste generations during construction
- Increase in Traffic
- Soil contamination at laydown areas
- Possible pollution of surface/groundwater
- Possible damage to archaeological objects if any found
- Employment opportunities

WildSkies Ecological Services (Pty) Ltd (hereafter referred to as WildSkies) was appointed to advise on bird impacts. "This proposed power line is situated in an area that is unlikely to attract threatened bird species either frequently or in high concentrations. With the involvement of environmentalists and bird specialists during the planning stages, its was mutually agreed to place the associated transmission line underground, to prevent bird impacts or exacerbate impacts of the already existing overhead powerlines in the area. most sensible route for the power line between the two substations has also in our opinion been identified. Tall structures in the landscape, the pole tops will however still provide important perches for large birds, including eagles and vultures. It is therefore important that these structures do not present an electrocution risk to these birds. With the relatively low numbers of vultures in Namibia, particularly the Cape Vultures, even one mortality would be cause for significant concern. In addition, due to the absence of surface water in the area, the PV plant and its 900m transmission line will pose less or no bird collision risk. If the findings of this report are adhered to, the power line should be allowed to proceed.

All known environmental and social risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that environmental performance be monitored regularly to ensure compliance and that corrective measures be taken if necessary. Issues that came out from the public participation meetings were mainly about job opportunities that could likely arise due to the proposed new power line. The interested and affected parties also raised vegetation impacts during construction. With the involvement of the environmental consultant at an early stages, the proponent has agreed to install solar panels that are less detrimental to vegetation. There is really minimal clearance required for this site due to the short nature of vegetation and the fact that most of the vegetation in the study area are short shrubs and grass. The panels will be pegged in the ground compared to the traditional panels with concrete stands. The vegetation under the panels will not be cleared, they will only be trimmed occasionally when they grow too high. areas outside the 6 Ha plot will be mostly left in its current state, with the only exceptions of access roads.

In general, the MetDecci Energy Investment (Pty) Ltd project would pose limited environmental risks, provided the EMP for the activity is used properly during planning, construction and operational phase, thus and the best option chosen is to develop power line with strict consideration of environmental aspects. The project will not have major environmental impacts as it is planned to be within a existing disturbed area which was cleared for farming purposes. The Environmental Management Plan should be used as an on-site tool during all phases of the Karibib Metdecci PV Plant project. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

PROJECT DETAILS

TEAM MEMBERS		
NAME	**POSITION**	**COMPANY**
C. Ailonga	Environmental Specialist	Matrix Consulting Services
M. Shippiki	Hydrogeologist/Environmental Practitioner	Matrix Consulting Services
R. Nuujoma	Environmental Practitioner	Matrix Consulting Services
D. Amutenya	Geo Scientist	Matrix Consulting Services
J. Smallie	Avifaunal Specialist	Wildskies Ecological Services

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ENVIRONMENTAL CONSULTANT	Matrix Consulting Services Chris Ailonga (MSc Env Sci, Wits) EIA Project Leader P.O. Box 25824 Windhoek Tel: +264-61 224197 Fax: +264-61 212165
REPORT STATUS:	**FINAL**

1. BACKGROUND AND INTRODUCTION

MetDecci Energy Investment (Pty) Ltd hereafter often referred to as the proponent is of the intention to establish a commercial solar energy facility within Karibib Townlands which lies South-West of the town. Following an extensive site identification process undertaken by MetDecci Energy Investment (Pty) Ltd a 15.2Ha site which lies in the Karibib Town Council was identified and approved by council for consideration as per resolution CM 0214/19/11/2014. The PV plant will have an associated 900m below ground transmission line to the existing NAMPOWER Karibib substation. The PV plant is proposed to be installed on a portion previously leased out to small stock farmers by Karibib Town Council , which is previously disturbed and de-bushed before for grazing purposes. The generation of electricity, transmission and supply of electricity is a 'listed activity' as per the 'List of Environmental activities' needing Environmental Clearance and accordingly requires and Environmental Impact Assessment (EIA) to be conducted. below is the location map for the proposed PV Plant in Karibib.

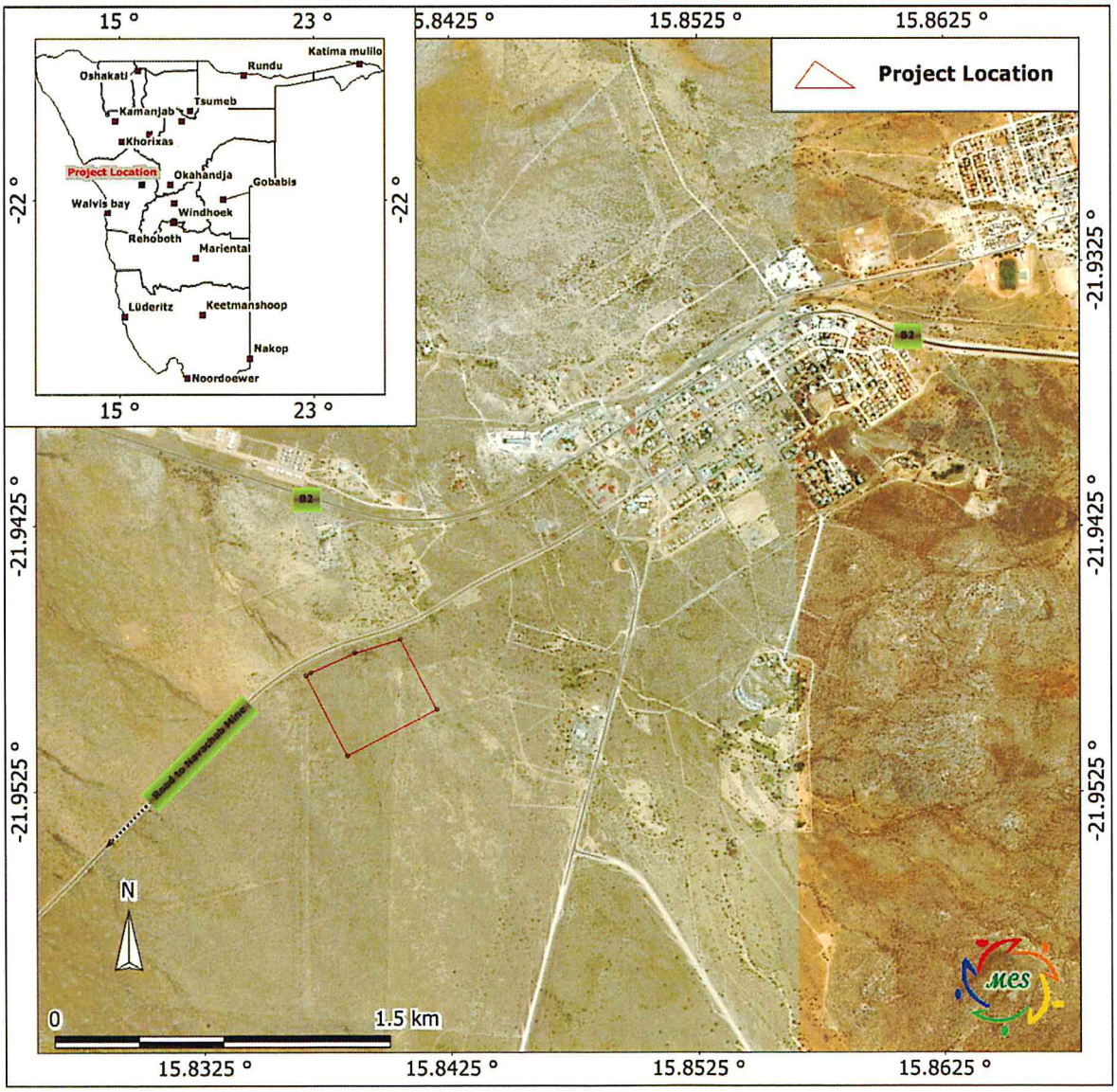


Figure 2: Proposed 5MW solar PV Plant location

The proponent commissioned this EIA and appointed Matrix Consulting Services to undertake the necessary activities to enable an application for an Environmental Clearance with the Environmental Commissioner as prescribed by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012). The location of the proposed site is indicated on the map.

A sensitivity analysis was undertaken during the Scoping Phase wherein the potentially sensitive areas which should be avoided within the 15.2 Ha area identified. The sensitive areas included areas of increased gradient/slope, potential occurrence of protected/endangered species, natural drainage line, and previously disturbed areas. As a result, the northern part of the study area was identified as a preferred area for development of the Solar PV Plant, based on the following characteristics:

- Proximity to a water abstraction points in the Xamigaub and Khan River
- Proximity to the existing grid for connection,
- Proximity to the B2 national road for access
- Proximity from areas previously disturbed
- Potential heritage sites
- Avoidance of drainage lines
- The presence of alluvial fans is limited
- Habitat complexity is low, e.g. no geomorphological changes such as rock outcrops were found.
- There is still adequate space between the proposed footprint area and the mainstream riverbeds (Xamigaub and Khan River) to institute suitable stormwater management structures (silt traps) and pollution containment areas.
- The site exhibits species that ubiquitous within the region.

The proposed facility, which will be primarily contained within the is identified portion, will have a developmental footprint of approximately 6Ha. The solar energy facility is proposed to be comprised of 5MW PV Plant, which is a system consisting of several rows of photovoltaic (PV) panels.

The plant is envisaged to be installed as follows:

Number of PV Modules: **19008 pieces**

Modules Inclination: **24°**

Distance from the fence: **5m**

Type of Modules: **260Wp Mono**

Structure type: **Solar PV panels, on a structured steel screw peg, instead of using concrete foundations.**

The mitigation measures recommended in this report and the conditions of approval provided in the MET record of decision apply to three phases of the project cycle:

- *The Design Phase*: These measures relate to the detailed layout, planning and design of the proposed power line, and will largely be implemented by MetDecci Energy Investment (Pty) Ltd and the engineering team, prior to the commencement of any physical activities on site.
- *The Construction Phase*: These mitigation measures are applicable during site preparation and construction on site, and will thus need to be implemented by the appointed contractors and sub-contractors. The Construction Phase of the project is considered to include all activities associated with:
  - ✓ Site preparation;
  - ✓ Construction activities (associated with all phases of project); and
  - ✓ Rehabilitation (if required)
- *The Operational Phase*: These mitigation measures are applicable during the operation of the Solar PV Plant and must therefore be implemented by METDECCI ENERGY INVESTMENT (PTY) LTD during operational phase of the power line.

2. Terms of Reference

METDECCI ENERGY INVESTMENT (PTY) LTD has commissioned an Environmental Impact Assessment (**EIA**) for the proposed Karibib 5MW Solar PV Plant and its below ground transmission line to the existing Karibib Nampower Substation. The project is one of the green development projects that the proponent has engaged. The proposed area is planned to be Karibib Townlands (See Fig 1).

Matrix Consulting Services was appointed to undertake the Environmental Impact Assessment of the proposed new Karibib 5MW Solar PV Plant project. This study will enable decision makers to make an informed decision regarding the development and make sure it does not have significant impacts and that they are mitigated. The environmental impact assessment was conducted to comply with the Environmental Assessment Policy (1995) and the Environmental Management Act (2007).

3. Project Information

3.1 Project Rationale

Countries around the world are being pressured to increase their share of renewable energy generation due to concerns related to climate change and the on-going, unsustainable exploitation of natural resources such as gas, oil, and coal. Grid connected renewable energy like Solar PV Plants are currently the fastest growing sector in the global energy market.

The project is justifiable in that it will stabilize Karibib/Namibia power supply, improve on power reliability and security hence cushioning against losses occasioned by power failures and blackouts and enhanced public safety. This will facilitate investments hitherto constrained by lack of electric power in Karibib and Namibia at large.

The proposed establishment serves to cater for existing and future load growth by providing reliable power supply for the increasing economic developments in Karibib as a result of mining operations within the surrounding areas. In addition, many citizens are flocking to the town mainly for employment purposes; this will elevate the power demands, and may cause power shortages or power failures in future. Therefore there is an urgent need to provide alternative power supply sources for the residents living in and around Karibib to prevent any inconveniences that may arise thereof.

Renewable energy is recognised internationally as a major contributor in protecting our climate, nature, and the environment as well as providing a wide range of environmental, economic, and social benefits that will contribute towards long-term global sustainability. It is considered viable that long-term benefits for the community and/or society in general can be realised should this

site in Karibib prove acceptable, from a technical and environmental perspective, for the establishment of a solar PV Plant.

Other Potential spin-offs from the Newly proposed 5MW Solar PV Plant:

- Potential revenue generation from power sales.
- Sustainable power supply of Karibib and Namibia
- Improve the sense of reliable power supply to potential Karibib and surrounding areas properties purchasers and businesses.
- Improved safety through the reduction of candle usage for lighting.
- It is estimated that the new jobs will improve the livelihoods of the workers and their families. Given that the unemployment rate of 34% in the region, this in itself is regarded as a significant benefit to the socio-economic situation in the region (2006 Regional Poverty Profile, Erongo Region).
- Skills development: Solar PV Plant operations activity requires specialised work and skills and it is expected that experts will transfer some skills to locals during the operational phase.
- General enhancement of the quality of life in Erongo Region and the surrounding area, should the project be viable.

3.2 New Solar PV Plant Activities

3.2.1 Solar PV Plant operations

Construction activities

- Transportation of relevant material.
- Installation of solar panels and associated transmission line.
- Demarcation and fencing of temporary laydown areas
- Clearing and trimming of vegetation

Operational activities

- Management and monitoring of the solar plant and its associated transmission line.
- Maintenance of power line.
- Monitoring of bird mortalities within the solar plant.
- Clearing of the access roads and trimming of shrubs and trees periodically.

3.2.2 Housing

No operators are allowed to camp on site during all phases of the project. Camp location must be liaised with Karibib Town Council and surrounding neighbours.

3.2.3 Access road

The site will be accessed using the existing service road for the Transnamib railway. No additional access tracks to the site will be created.

3.2.4 Waste Management

All waste generated at the site will be collected in plastic or steel drums and removed from site and disposed at a suitable waste cell. Hazardous waste will be collected and stored separately, and disposed of at an appropriate hazardous waste cell or landfill.

Mobile toilets must be accessible to the operators during the construction and operational phase.

3.2.5 Site Rehabilitation

The site will be cleared of all chemical and hydrocarbon spills after construction, and levelled to acceptable slopes before re-vegetation.

4. SPECIALIST STUDIES

The specialist studies were conducted focusing on the study area of 15.2 Ha .The following specialist studies were conducted by a highly experienced team of experts:

Avifaunal Specialist Study (Specialist input during planning stages.	Jonathan Smallie, Wildskies Ecological Services, MSc Environmental science.
Ecological Specialist Study (Appendix H)	Fransiska Kangombe, BSc Environmental Biology , BSc hons, Plant sciences, MSc Plant Science.

5. ENVIRONMENTAL STUDY REQUIREMENTS

According to the Environmental Management Act no. 7 of 2007 the proponent requires an environmental clearance certificate from the Ministry of Environment and Tourism (Department of Environmental Affairs) to develop the new 5MW solar plant. The certificate means that the Ministry of Environment and Tourism is satisfied that the activity in question will not have an unduly negative impact on the environment. It may set conditions for the activity to prevent or to minimise harmful impacts on the environment.

The proposed development is listed as a project requiring an environmental assessment as per the following listed points in the environmental management act:

- The generation of electricity
- The transmission and supply of electricity.

6. DESCRIPTION OF ALTERNATIVES

6.1 No-Go Alternative

The no-development alternative is the option of not going ahead with the construction of the new 5MW solar plant in Karibib. Should the proposed activity not take place, the town and the region could be deprived of an upgrade of their power supply. The proposed activity could yield positive results that could provide a reliable source of energy in Karibib and its potential industrial projects.

The increasing power demand in Namibia is placing ever-increasing pressure on the existing power generation capacity. Therefore additional electricity generation options need to be developed throughout the country. The support for renewable energy initiatives are guided by a rationale that Namibia has very attractive ranges of renewable resources, particularly solar and wind and that renewable sources are in fact the least-cost energy service in many cases and more so when social and environmental costs are taken into account. The Karibib Solar PV Plant offers the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses.

From the resource saving point, conventional coal fired plants are major consumers of water during their requisite cooling processes. As an already water stressed country, it is critical that Namibia engages in a variety of water conservation initiatives , particularly due to the detrimental effects of climate change on water availability. The release of by-products from the burning of fossil fuels for electricity generation has hazardous impact on health and contributes to environmental degradation.

The renewable energy alternatives offers the opportunity to address energy needs in an environmental responsible manner and ultimately contributing to the fight against climate change through the reduction of greenhouse gas

emissions. Namibia committed to the Kyoto Protocol, thus these kind of initiatives would demonstrate its commitment to this international agreement.

The No-go option will not be a viable alternative at this stage.

6.2 Technology Alternative

The economics of a solar energy facility depend on the solar resource at the site. Detailed and reliable information about this resource is vital when considering the installation of such a facility and the type of technology to be installed. Several technologies exist including Concentrating Solar Power (CSP), Concentrating Photovoltaic Power (CPV), and Tracking Photovoltaic Power (TPV).

The selection of a preferred technology will be made from multifaceted decision-making framework. These include the outcome of the solar technologies and the Engineering, Procurement, and Construction (EPC) partner whom Metdecci Energy Investment (Pty) Ltd selects. However as it stands, the current technology options to be utilised on this site include:

- **Photovoltaic panels**
  - ✓ Photovoltaic (PV) facilities use semiconductors/PV cells which absorb solar energy to produce electricity through the "Photovoltaic Effect." The individual PV cells are commonly constructed from silicon and are linked together and placed behind a protective glass sheet to operate in unison as a PV panel. A single PV cell is sufficient to power a small device such as an emergency telephone, however to produce 5 MW of power, the proposed plant will require numerous cells arranged in multiples/arrays which will be fixed to support structures or mounts. In order to maximise the electricity generated these mounts need to be angled in such a fashion so to receive the maximum amount of solar radiation throughout the year. The PV cell performance is directly proportional to the solar intensity. Therefore the efficiency is affected by the intensity of the sunlight on an optimally oriented panel at the specific location, at the specific time. Clouds cover would cause a further decrease in efficiency.

- **Parabolic trough system**
  - ✓ A trough system is comprised of two component groups, firstly a heat collection system and secondly a conventional generating plant portion. The heat collection system is comprised of parabolic collectors, a receiver tube/heat collection element, which absorbs the solar energy received from the parabolic trough, a sun-tracking system (e.g. an electronic control system and associated mechanical drive system used to focus the reflector onto the sun), and support structure (e.g. holds the parabolic trough in accurate alignment with incoming solar radiation while resisting the effects of the wind). The collected energy in the heat transfer fluid is used to generate steam through a conventional heat exchanger system that is in turn used for electricity generation in a conventional steam turbine and generator.

- **Heliostats and associated power tower**
  - ✓ A power tower system is also comprised of a heat collection system and a conventional generating plant portion. The heat collection system consists of heliostats (movable, flat reflective mirrors which are oriented according to the sun's position in order to capture and reflect the solar radiation) and a receiver (consisting of metal tubes which transfer the heat from the solar radiation to water with the purpose of generating steam). The receiver is mounted on a 160 – 180 m high power tower that provides elevation and structurally supports the receiver. In the generating portion the steam drives a turbine which is connected to a generator (in order to produce electricity, as stated before). Power tower plants must be large to be economical.

6.3 Site Alternative/Layout Design Alternatives

The site for the proposed facility is regarded by Metedecci Energy Investment (Pty) Ltd as preferential based on several site/region specific characteristics. Based on these preferences, no further site alternatives have been considered in this EIA process.

- The economic viability of a solar facility is directly dependent on the annual direct solar irradiation values. Karibib receives high average daily direct normal irradiation with an average daily solar radiation of between 5.8 - 6.0 kWh/m2 per day (Mandelsohn et. al, 2003).
- An area with favourable flat terrain facilitates the construction and maintenance of the solar thermal facility, and reduces the need for civil/earthworks.
- Sufficient open space within an area is a restraining factor, The infrastructure for this proposed site is estimated to cover a developmental footprint of 6 Ha from the total of allocated 15.2 Ha area.
- The generated electricity will be sold to a single buyer entity (NAMPOWER), as part of a power purchase agreement between this entity and Metedecci Energy Investment (Pty) Ltd. Therefore the power will need to be evacuated into the NAMPOWER grid. The site is located approximately 900m north-east of an existing Nampower Karibib Distribution Substation connected to a 66Kv Distribution Powerline.
- The site is preferred due to the historic disturbance which has occurred on the site. Although comprising natural vegetation, the vegetation has been transformed through grazing activities across the site.
- The site is preferred due to its proximity to the B2 National Road.
- One feasible alternative route has been proposed for the external access road. Navachab mine road (the preferred route) runs in a south-westerly direction for towards the Mine. This road is preferred from a technical perspective for the following reasons:
  - ✓ This route is shorter in distance
  - ✓ From a planning perspective, this route is simpler as the point of connection to the existing B2 road

6.4 Power Line Alternatives

The two options were considered :

- ✓ Overhead transmission line
- ✓ Below ground transmission line

The underground transmission of 900m was chosen as the preferred alternative as it poses zero risks to bird life (on recommendation from the avifaunal specialist, Jonathan Smallie, Wildskies Ecological Services).

7. SCOPE of the EIA

The scope of the EIA aims at identifying and evaluating potential environmental impacts emanating from the proposed 5MW Solar PV Plant in Karibib. Relevant data have been compiled by making use of secondary sources and from project site visits. Potential environmental impacts and associated social impacts are identified and addressed in this report.

The environmental impact assessment report aims to address the following:

a) Identification of potential positive and negative environmental impacts.

b) Provide sufficient information to determine if the proposed project will result in significant adverse impacts.

c) Identification of "hotspots" which should be avoided where possible due to the significance of impacts.

d) Evaluation of the nature and extent of potential environmental impacts.

e) Identify a range of management actions which could mitigate the potential adverse impacts to required levels.

f) Provide sufficient information to the Ministry of Environment to make an informed decision regarding the proposed project.

g) Present and incorporate comments made by stakeholders.

8. METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment that could arise from the new 5MW Karibib Solar PV Plant in the Erongo Region:

a) Information about the site and its surroundings was obtained from existing secondary information and site visits.

b) Neighbours, interested and affected Parties (I&APs) were consulted and their views, comments and opinions are presented in this report.

9. STATUTORY REQUIREMENTS

9.1 National Legislative Requirements

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1996, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislations are relevant to this project:

➢ *The Namibian Constitution*

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

➢ *Environmental Management Act No.7 of 2007*

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

(a) to make sure that people consider the impact of activities on the environment carefully and in good time.

(b) to make sure that all interested or affected people have a chance to participate in environmental assessments

(c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

Line Ministry: Ministry of Environment and Tourism

- ***Atmosphere Pollution Prevention Ordinance (1976)***

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Line Ministry: Ministry of Environment and Tourism

- ***Water Resources Management Act of Namibia (2004)***

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

- ***Water Act No.54 of 1956***

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse. Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- ✓ Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and
- ✓ Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

- ***The Draft Wetland Policy (1993)***

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

Line Ministry: Ministry of Environment and Tourism

- ***Environmental Assessment Policy of Namibia (1995)***

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

Line Ministry: Ministry of Environment and Tourism

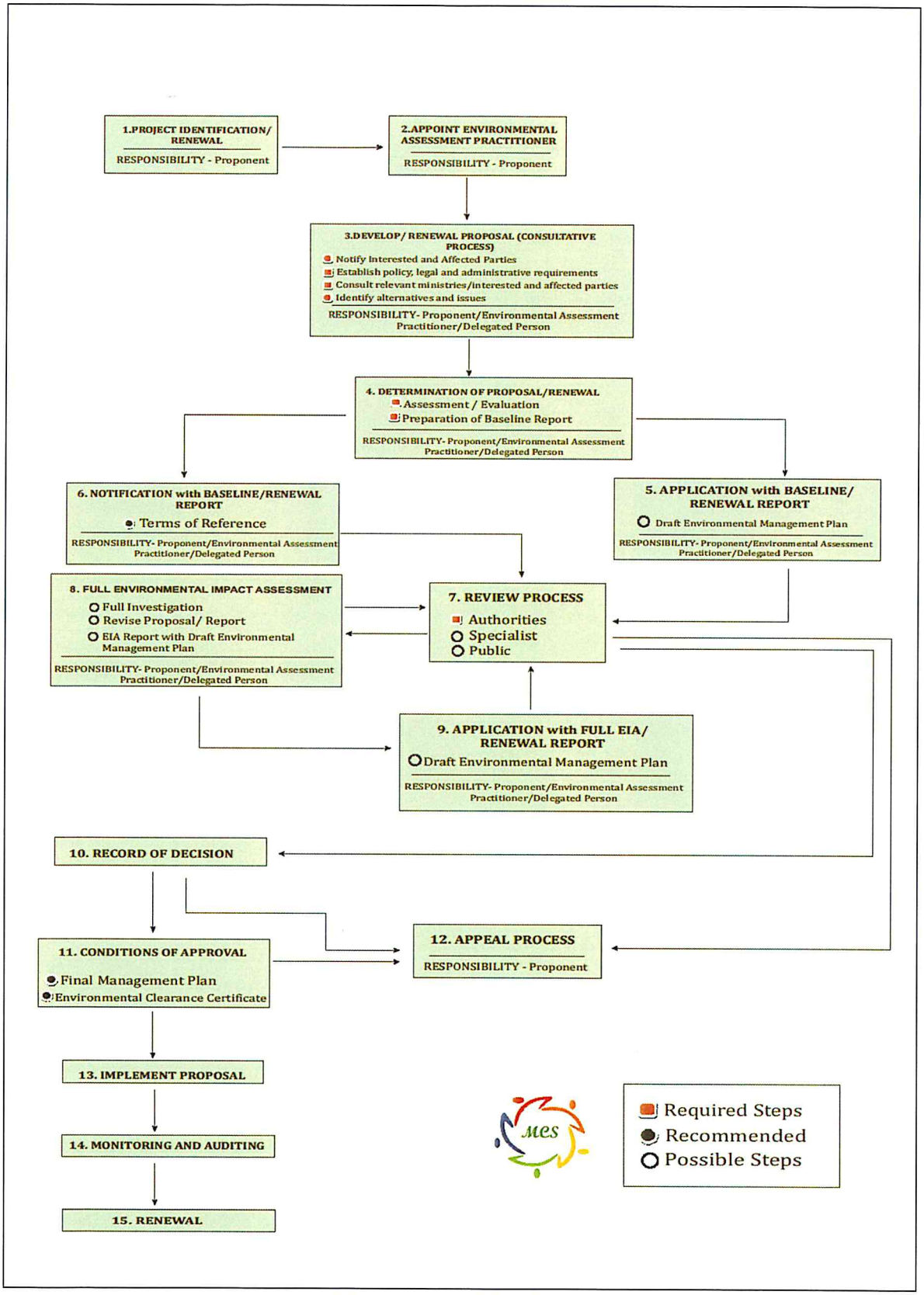


Figure 3: Environmental Assessment Procedure of Namibia *(Adapted from the Environmental Assessment Policy of 1995)*

➢ ***Draft Pollution Control and Waste Management Bill***

The proposed new 5MW Karibib Power Plant project, only applies to Parts 2 and 7 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

➢ ***Hazardous Substances Ordinance No. 14 of 1974***

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

➢ ***Public Health Act 36 of 1919 and Subsequent Amendments***

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the solar project are expected to include dust, air quality impacts, noise nuisance and smoke emissions.

Line Ministry: Ministry of Health and Social Services

9.2 International Conventions and Regulations

Article 144 of the Namibian Constitution states that "the general rules of public international law and international agreements binding upon Namibia form part of the law of Namibia." This means that all the international agreements that Namibia signed become part of the law of our country. These laws and/or agreements are:

- ✓ Convention on Biological Diversity, 1992;
- ✓ United Nations Framework Convention on Climate Change, 1992;
- ✓ Kyoto Protocol on the Framework Convention on Climate Change, 1998;
- ✓ Stockholm Convention of Persistent Organic Pollutants, 2001.

10. GENERAL ENVIRONMENT OF THE STUDY AREA

This section lists the most important environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

10.1 Location and Land Use

Metdecci Energy Investment (Pty) Ltd plans to erect a 5MW Solar PV Plant in Karibib. The Solar Plant is envisaged to have a developmental footprint of 6Ha. (See locality map: fig 2). The proposed Solar Plant Area is surrounded by small holdings, cemetery and undeveloped townlands.

10.2 Topography and Surface Water

Karibib lies within the Central-Western Plains which stretch back from the coast, this broad area of plains extends inland for about 450 km in places. The plains were largely formed by erosion cutting back into higher ground and carving out the catchment areas of several major rivers. The Khan, Omaruru, Swakop and Ugab rivers are the most prominent of these. Much of the area lies between 1200 and 1400m above sea level, and consist of metamorphic rocks that were forced up out of the sea during the formation of the Gondwana continent some 550 million years ago.

Surface drainage in the area is not well developed and runoff collects takes place in the nearby streams, which are tributaries of the Xamigaub River. The general drainage from the site is expected in a south-westerly direction.

10.3 Climate (Mandelsohn et al, 2003)

Table 1. Climate Data

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be between 200-250 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 50-60 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 2100-2240 mm per year.
Precipitation:	The highest summer rains are experienced in February.
Water Deficit:	Water deficit in the area is averaged to be between 2100-2300 mm per year.

Temperatures:	Temperatures in the area are averaged to be between 20- 22 °C per year.
Wind direction:	Wind directions in the area are predominantly easterly and southerly winds.

10.4 Geology of the Area

The area of Karibib is situated within the northern part of the Central Zone of the late Proterozoic Damara orogenic belt. The Damara Belt in central Namibia forms part of a system of Pan-African collisional belts in southern Africa that record the amalgamation of the Gondwana supercontinent in the latest Proterozoic and early Phanerozoic (Miller, 2008). The geological scenario in this area encompasses classical geosynclines metasedimentary and intrusive rocks belonging to the Damaran and Karoo Sequences, thus spanning more than 400 Ma of earth history. On the platform edges of the trough chiefly calcareous sediments were deposited. Both rock suites were subsequently folded and metamorphosed and granitic intrusion took place. Bands of marble and quartzite in these otherwise phyllitic metamorphic rocks are of hydrogeological significance. Several anorogenic complexes of Cretaceous age are present are present in the area. Karibib Carbonate Complex forms a prominent landmark. Also, numerous pinnacles of Damara granite and rounded quartzite hill rises above most of the flat landscape in the area (Miller, 2008; Schneider, 2004).

The geology of Karibib itself, consists mainly of marble, schist, quartzite, calc-silicate and graphitic schist of the Damara Sequence (Swakop Group) in the northern half of the town, whereas undifferentiated Damara granites are situated more in the southern half of the town. As you drive out of town northward to Otjiwarongo, rocks of syn - to post-tectonic granite, granodiorite, monzonite and diorite are observed.

10.5 Hydrogeological Characteristics

The groundwater potential of fractured aquifers in the Swakop Group of the Damara Sequence is generally low. However, the carbonates (marbles and limestones) are of moderate potential and at properly selected targets like fracture zones and karstified contact zones, even high yields can be found. This depends on the amount of rainfall and associated weathering and recharge. The most significant aquifer presently utilised is the marble aquifer north and north-east of Otjiwarongo. The water supply scheme relies on a fractured and slightly karstified marble band of the Karibib Formation, which allows medium to high pumping rates and supplies Group B water. The water supply scheme of Karibib is situated between Omaruru and

Otjiwarongo in an area underlain by meta-sediments and granites of the Damara Sequence that have a low groundwater potential (Christelis and Struckmeier, 2001). Alluvial sediments of the Omaruru ephemeral River provide another good aquifer and a source of water for nearby urban centres and settlements including Karibib (Schneider, 2014).

Groundwater flow from the site can be expected in a south-westerly direction. Local flow patterns may vary due to groundwater abstraction in the area. According to the Department of Water Affairs (DWA) database, 7 boreholes are located within a 2km radius of the project location. The water table at the site is expected to between 10mbs and 30mbs. Water quality in the area is generally good and classified good quality water, according to Namibian drinking water quality standards.

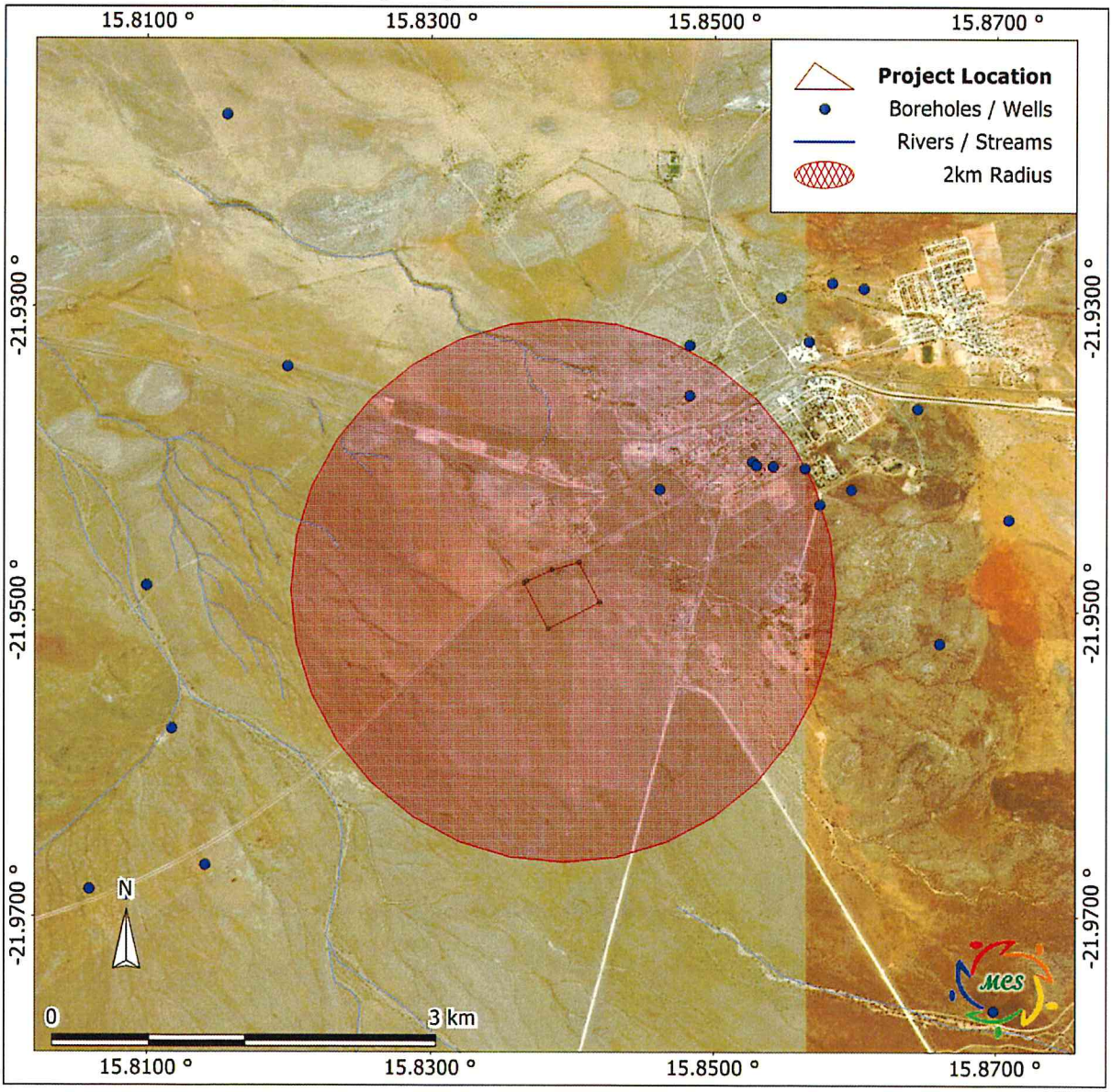


Figure 4: Hydrology and Hydrogeology map of the area.

10.6 General Ecology of the Area

The site falls within the Tree-and-shrub Savanna biome, in particular the Acacia Tree-and shrub Savanna sub biome which is characterised by Thornbush Shrubland vegetation type. The dominant vegetation structure is Acacia shrublands that grow on various soils present in the area. The Acacia Tree-and-shrub Savanna is characterised by large, open expanses of grasslands dotted with Acacia trees. The trees are tallest in the areas of deeper sands in the east, with plant growth becoming progressively shrubby further west where the soils are shallower and the landscape is more hilly and rocky. Environmental variables that affect the Acacia Tree-and-shrub Savanna sub-biome include summer rainfall, frequent widespread fires and grazing pressures from wildlife and livestock.

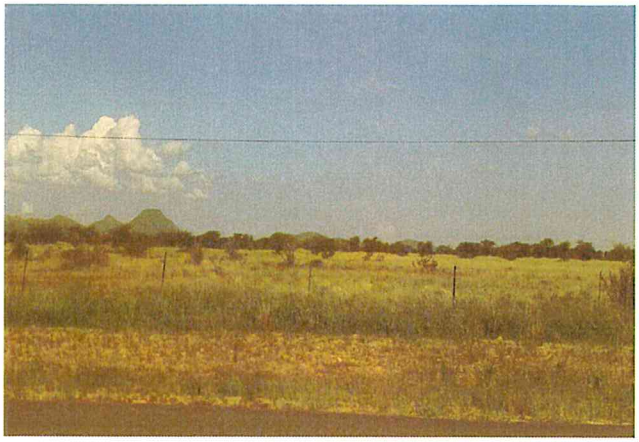
Deducing from the Atlas of Namibia, the proposed site is within the area that is known to have between 300-399 plant species (Mandelsohn et al, 2003). According to Fransiska Kangombe (Ecological specialist), the vegetation at the proposed site shows evidence of previous disturbances as supported by only a few scattered shrub and tree species, not more than 5m in height. The specialist has identified Parkinsonia Africana as the only protected specie on site which needs to be conserved and avoid as much as possible. With regards to fauna, it is estimated that at least 61 to 70 reptile, 4 to 7 amphibian, 61 to 75 mammal and 171 to 200 bird species (breeding residents) are known to or are expected to occur in the project area of which many proportions are endemics. The bird specialist has recommended an underground transmission line instead of an overhead transmission to reduce the risks of large birds electrocutions.

The surrounding vegetation on site consists mainly of grass, shrubs and trees which are all sparsely distributed. The following photos below illustrate the typical vegetation on site. See vegetation map (Figure 5) below.

Vegetation on site

Vegetation on site

Vegetation on site



Vegetation on site

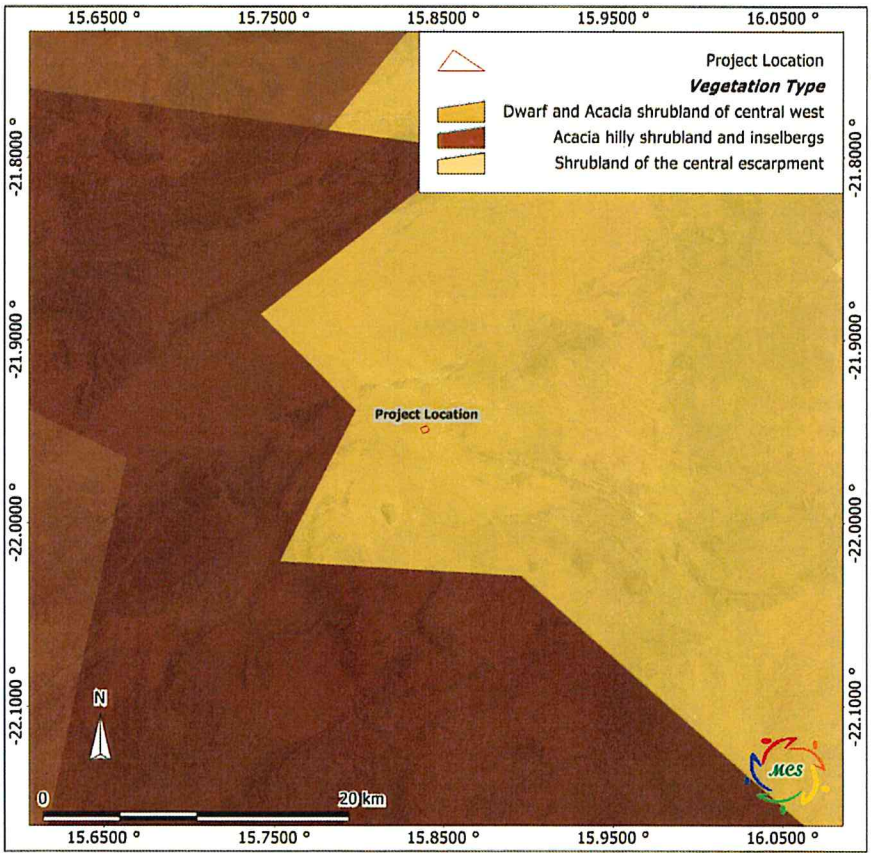


Figure 5: Vegetation map of the area

11. SOCIO-ECONOMIC ASPECTS

This section provides an overview of socio-economic characteristics of the study area. It provides regional and local information on the, economic activities, population dynamics, vulnerability, and social services currently available in the area.

11.1 Regional Information

The proposed Karibib 5MW Solar Plant will be situated in Karibib, which forms part of Erongo Region, Namibia. The total current population of Erongo Region is estimated to be 107,663 with 50,040 females and 57,616 males (NPC, 2011). Ninety seven percent of the population living in the Erongo Region over 15 years of age are literate (NSA, 2011). The estimated unemployment rate in Erongo region is 30% (NSA, 2011). The population density in the Erongo Region is 2.4 persons per km^2.

The life expectancy in Erongo region is 59 years for females and 54 years in males (NPC, 2001). The Human poverty index (HPI) in Erongo Region is 18.7 compared to 24.7 of the National HPI (NPC, Erongo Regional Poverty Profile, 2007).

11.2 Karibib

Karibib is a town in the Erongo Region of western Namibia. Karibib is the district capital of the Karibib electoral constituency. It is situated on the Khan River, halfway between Windhoek and Swakopmund on the B2 (Trans-Kalahari Highway. The town is known for its aragonite marble quarries and the Navachab Gold Mine. Karibib was downgraded to "town" status in 2010.

11.2.1 Economic Activities

The Tourism, Mining and Fisheries sectors are the main contributors to the economy in the Erongo Region. The Erongo desalination plant has been the regions highest achievement thus far in terms of economic growth. Walvis Bay and Swakopmund are the most desired tourist attraction in the region for foreigners as well as local tourists from Namibia. Due to the favourable mining actvities in Karibib, many people choose to live in Karibib to either work or to seek employment. Despite the few recreational places and activities offered in Karibib the youth and local community still resort to frequenting shebeens/bars.

11.2.2. Employment (Job Opportunities)

Unemployment still hampers most of the developing world and Erongo region is not an exception. In Erongo region 70.1% of the economically active are employed, while the remaining 29.9% are unemployed. The main source of income for over half (67%) of the population living in the Erongo

region is from wages and salaries. Non-farming business is the second highest source of income with 9%, while the remaining population rely on Pension (8%), Cash Remittance (5%) and Farming (3%) (NPC, Erongo Regional Poverty Profile, 2007).

The proposed project may require construction services which involve engineers, construction firms, equipment vendors, and utilities. All of this cost is spent locally for piping, construction, and operational personnel, contractors, providing additional economic benefits to the community through increased employment. The construction phase of the project will provide job opportunities, of which approximately 80% are expected to be unskilled and semi-skilled people.

Some of the services in the operational phase will be outsourced e.g. maintenance of security services, waste removal etc. The outsourcing of these services will strengthen existing businesses operating in the area and provide employment to people.

11.2.3 Livelihoods

Economic activities in the region are limited and livelihoods are heavily dependent on wages and salaries from government institutions, local authority, hotels, farming, mining, mineral exploration and fishing activities. Wages and Salaries constitute the main source of income for 67 percent of the total population in the Erongo Region, while farming is the main source of income for only 4 percent of households. The largest occupational group in the Erongo Region includes labourers and other skilled occupations and constitutes 28% of all employed persons, whereas the second largest occupational group is craft and related trade workers making up 19% of the employed population. The livelihoods of the local community are likely to be positively impacted therefore predicted to be better than before the development of the facility in the area (NPC, Erongo Regional Poverty Profile, 2007).

11. 2.4 Tourism

The area attracts a lot of tourists from all over the world. The area attracts a lot of tourists from all over the world. Many tourists and locals travelling to the coastal towns make a pit stop at Karibib. It is also the close to the famous Spitzkoppe, Tsaobis Leopard Nature Park is located 80 km south of the C32 Karibib, Erindi Private Game Reserve is one hundred kilometers northeast of Karibib etc. Excessive waste, dust, noise and vibrations can have negative impacts on the tourism industry in the area, as it can become a nuisance to tourists. Mitigation measures at the site must be put in place to reduce these impacts.

Tourists travelling to Swakopmund, Walvis Bay and or Henties Bay for a historical experience often make use of these accommodation establishments and food outlets in Karibib. Excessive waste, dust, noise, vibrations and appalling air quality can have negative impacts on the tourism industry in the area, as it can become a nuisance to tourists.

11. 2.5 In - Migration

Due to enhanced employment opportunities that could be created by the envisaged project, some in-migration of job seekers to Karibib can be expected. Depending on the amount of in-migration, local areas may start experiencing overcrowdings, over use of infrastructure, local conflicts, increase of goods prices due to increased demand etc.

11. 2.6 HIV & Prostitution

Namibia is one of the ten worst affected countries in terms of the HIV/AIDS epidemic. The HIV prevalence rate for the age group 15 to 49 is estimated at 21.3% for Namibia (UNDP, 2005). The HIV/AIDS prevalence rate among adult pregnant women in the Erongo region is 27 %(NPC, Erongo Regional Poverty Profile).

The spending powers of locals working for the proposed project are likely to increase, and this might be a perfect opportunity for sex workers to explore. Migrant labourers from other regions and expatriates are normally vulnerable and may use the services rendered by the sex workers.

Should the HIV prevalence increase, the following consequential issues could arise:

- Reduced workforce in the Erongo Region.
- Diversion of income expenditure to medical care.
- Increase in orphans and households headed by children.
- Increase in pregnancy related mortality.
- Increase in current rate of persons per doctor of 12170.

11. 2.7 Infrastructure & Increased Traffic

Karibib is a town situated in western Namibia. It lies on the B2 road which stretches further to the Trans Kalahari Highway. The infrastructure clearly displays the town's historical events that occurred in the past. Although most roads are tarred especially in the Centre of the town, some roads are still gravel. A railway track from Karibib to Windhoek is also currently available. Other facilities like telecommunication and electricity in the town are well established.

In Erongo Region, 96% of households have access to safe water. Over 11% have no access to toilet facility. Also 75% of all households have access to radio, 15% have access to wood/charcoal for cooking and only 81% to electricity.

The number of traffic in the area is expected to increase slightly and it might contribute to heavy traffic during peak hours and a higher number of car accidents. Infrastructure like roads will be affected due to increased traffic and heavy-duty cargo trucks accessing the site.

11.2.8 Regional Education Status

According to EMIS (2011), there are a total number of 66 schools of which 49 are state owned and 17 privately owned in the Erongo Region. In addition, of the 32,114 learners in the Erongo 28,404 are enrolled in public schools while the remaining 3,710 attend private schools. Only 56 of all 1,280 teachers in the Erongo Region are without training. The percentage literacy for persons older than 15 years is 92% which is outstanding in comparison with the 81% of Namibia. The Erongo Region is known to yield exceptional results when it comes to academic ratings in the country, most schools offer quality education to the young ones as from primary to high schools.

11.2.9 Poverty status

Erongo Region's Human Poverty Index of 17.1 percent which makes it the less poverty stricken region when compared to the national average of 24.7. Water and Proper Sanitation are considered the two key poverty indicators in the Erongo Region. Urban areas in the Erongo region have access to safe water while rural areas rely on unsafe water for drinking and cooking. Households that have no source of income, shelter, car, begged around and that sells empty bottles to get cash for food are considered to be "very poor". Additionally "poor" households have at least one person receiving a monthly income, receive remittances, perform odd jobs like domestic work or car washing and sometimes women resort to prostitution for money. Therefore, a good quality of life in the Erongo region is represented by the total opposite factors mentioned above, which

includes good formal employment, houses and cars and receiving a high monthly income.

12. STAKEHOLDER PARTICIPATION

Consultation with the public forms an integral component of an EIA investigation and enables I&APs e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the proposed development and to identify additional issues which they feel should be addressed in the EIA. The primary aims of public participation were:

- ❖ To initiate participation of Interested and affected parties (I&APs), e.g. local authorities and communities.
- ❖ To inform I&APs and key stakeholders about the proposed development.
- ❖ To identify issues and concerns of key stakeholders and I&Aps with regards to the proposed development.
- ❖ To provide information to enable informed decision making
- ❖ To develop a communication structure with stakeholder and I&APs
- ❖ To promote transparency of the project
- ❖ To ensure the public and stakeholders comments are considered for the development.
- ❖ To provide answers to I&APs queries
- ❖ To encourage shared responsibility and sense of ownership.

Decision-making authorities were consulted throughout from the outset of the study, and have been engaged throughout the project process. Consultation with the department of Environmental Affairs (MET) included the environmental assessment procedure and application procedure.

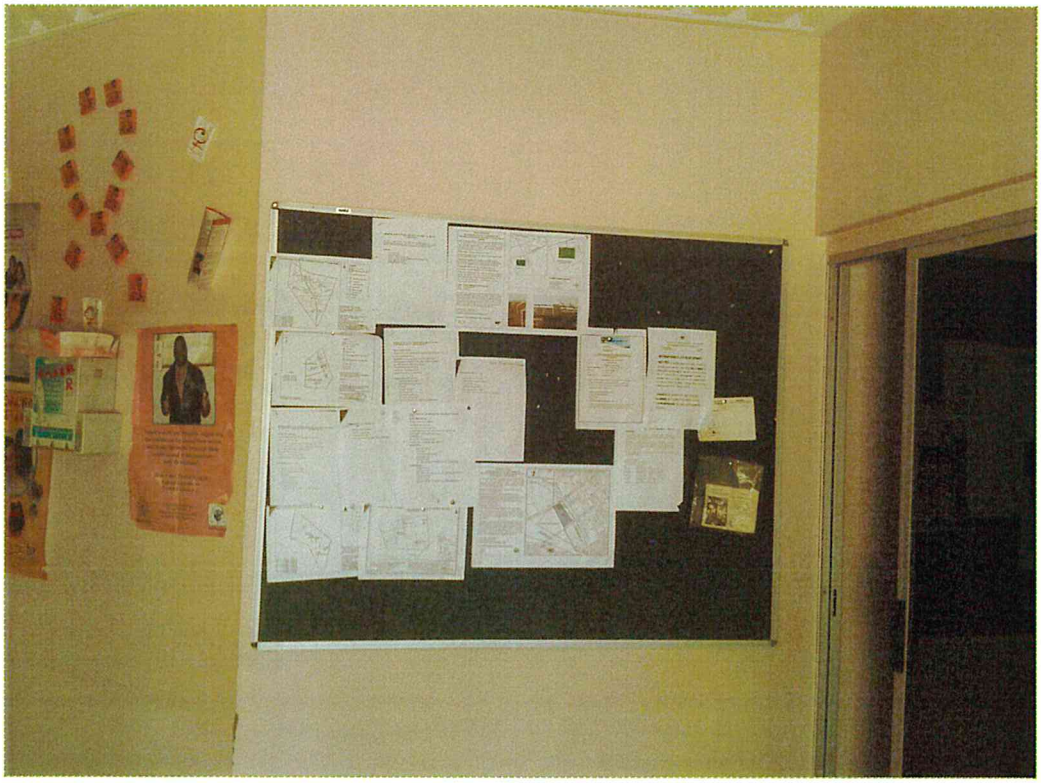
Public participation notices were advertised in three local newspapers on two different occasions, namely; (See Appendix D)

- ✓ The Namibian, on 18 March and 26 March 2015,
- ✓ The New Era, on 18 March, 26 March 2015, and 02 April 2015

In the adverts an e-mail address was provided to the general public to register as interested and affected parties; and to request a background information document for the project. A public meeting (open day session) was held at the Usab Community Hall , in Karibib at **17h15**, on the 30th of March 2015. An environmental assessment and process presentation were presented at public participation meetings (see appendix I).

Some invited stakeholders did not make it to the meeting in spite receiving invitations and mass media advertising. The public participation meeting on the 30th of March 2015 attracted some people, besides the client and consultant. The meeting went ahead, and no objections to project were recorded. The general concerns were about job employment opportunities for locals, possible increased municipal power rates, and involvement of locals in the construction phase. The participants who attended applauded the Metdecci Energy Investment (PTY) LTD for taking this initiative. The Major of Karibib Town Council was also consulted and, indicated no obvious environmental concerns regarding the proposed project. The minutes of the meeting attached in appendix E.

Ms. Grasiana Beralius wants to get skills of mega solar pv installation, while Ms. Sonja Loots Mr. Frank Lohnert from the National Botanical Research Institute recommended getting species list from NBRI to proactively identify protected species. (Via E-mail, See Appendix G). A site poster was also placed on the site as indicated below.



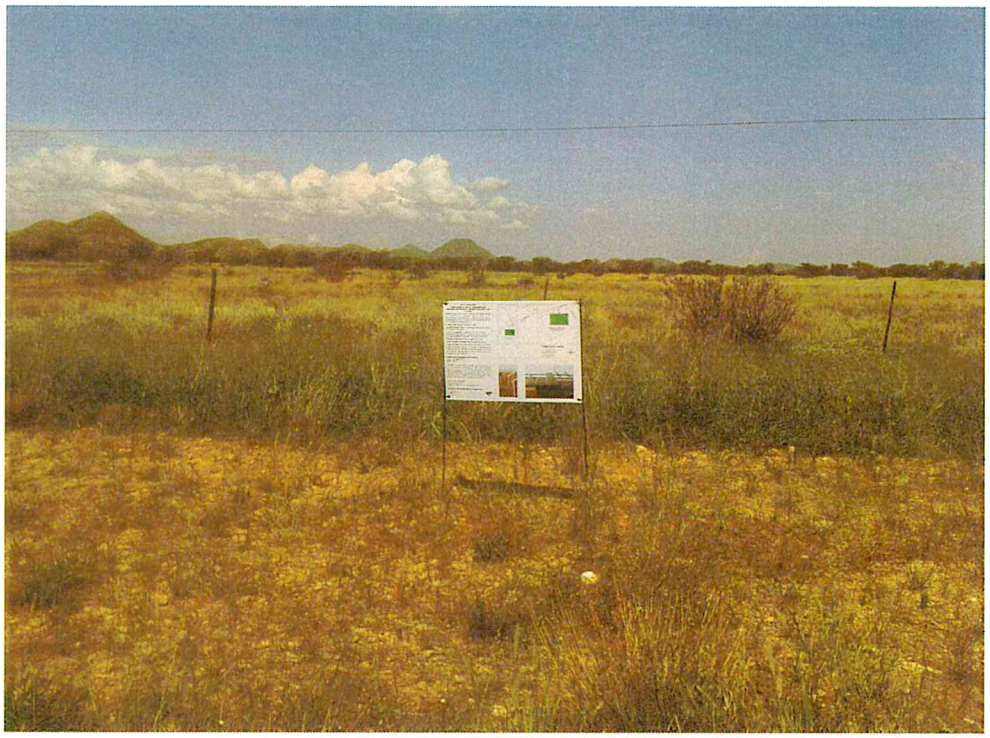


Table 2. Interviewed Stakeholders/I&APS

NAME	ORGANISATION/ERF	DESIGNATION/POSITION
Dr. F.M Sikabongo	Ministry of Environment and Tourism, Directorate of Environmental Affairs	Environmental Legislation Consultation
Mrs. A. Ileka	MAWF: Water Affairs	Acting Director
Mr. D. Amutenya	Matrix Consulting Services	Consultant
Mr. Chris Ailonga	Matrix Consulting Services	Consultant
Mr. L. Goreseb	Karibib Town Council	Interested/ Affected Parties
Mr. D. Iipinge	Karibib Town Council	Interested/ Affected Parties
Mr. B. Uugwanga	Lithon Projects Consultants	Interested/ Affected Parties
Mr. P. Pavel	Metdecci Solar	Interested/ Affected Parties
Mr. L. Iiyambo	Metedecci Energy Inv.	Interested/ Affected Parties
Ms. D. Lukavska	Metdecci Energy Inv.	Interested/ Affected Parties
Mr. J. Mathew	Metdecci Energy Inv.	Interested/ Affected Parties
Mr. D. Uupindi	Karibib Town Council	Interested/ Affected Parties

Mr. M. Shippiki	Matrix Consulting Services	Consultant
Mr. S. Loots	NBRI	Interested/ Affected Parties
Mr. F. Lohnert	NBRI	Interested/ Affected Parties
Ms. G. Beralius	Business Owner - EMG Investments cc	Interested/ Affected Parties
Mr. K. Avia	Private-Karibib resident	Interested / Affected Parties

13. ENVIRONMENTAL IMPACT EVALUATION

The Environmental Impact Assessment sets out potential positive and negative environmental impacts associated with the proposed New 5MW Karibib Solar Plant. The following assessment methodology will be used to examine each impact identified, see Table 3:

Table 3. Impact Evaluation Criterion *(DEAT 2006)*

Criteria	Rating (Severity)	
Impact Type	+VE	Positive
	0	No Impact
	-VE	Negative
Significance of impact being either	L	Low (Little or no impact)
	M	Medium (Manageable impacts).
	H	High (Adverse impact).

Probability:	Duration:
5 - Definite/don't know	5 - Permanent
4 - Highly probable	4 - Long-term (impact ceases
3 - Medium probability	3 - Medium-term (5-15 years)
2 - Low probability	2 - Short-term (0-5 years)
1 - Improbable	1 - Immediate
0 - None	
Scale:	**Magnitude:**
5 - International	10 - Very high/don't know
4 - National	8 - High
3 - Regional	6 - Moderate
2 - Local	4 - Low
1 - Site only	2 - Minor
	0 - None

13.1 Construction Activities of the 5MW Solar PV Plant

13.1.1 Dust Pollution and Air Quality

Dust will be generated during the construction of the solar and problems thereof are expected to be site specific. Dust is expected to be worse during the winter months when strong winds occur. Release of various dust particles, exhaust fumes from vehicles and machinery related to project are also expected to take place.

It is recommended that regular dust suppression be included in the construction activities, when dust becomes an issue. No unnecessary revving of engines or operation of vehicles is allowed. In general, the power line project is envisaged to have minimal impacts on the surrounding air quality, as the project location is far from the nearest residences for the bigger part of the power line.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	L	L

13.1.2 Noise Impact

An increase of ambient noise levels at the site is expected due to the construction activities. Noise pollution due to heavy-duty equipment and machinery will be generated.

It is not expected that the noise generated during construction will impact any third parties. Ensure all mufflers on vehicles are in full operational order; and any audio equipment should not be played at levels considered intrusive by others. The staff should be equipped with ear protection equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	1	4	4	M	L

13.1.3 Safety and Security

Safety issues could arise from the earthmoving equipment and tools that will be used on site during the construction phase. This increases the possibility of injuries and the contractor must ensure that all staff members are made aware of the potential risks of injuries on site. The presence of equipment lying around on site may also encourage criminal activities (theft).

Sensitize operators of earthmoving equipment and tools to switch off engines of vehicles or machinery not being used. The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.

No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. Proper barricading and/or fencing around the work sites should be erected to avoid entrance of animals and/or unauthorized persons. Safety regulatory signs should be placed at strategic locations to ensure awareness. Adequate lighting within and around the construction locations should be erected, when visibility becomes an issue.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety & Security	-VE	1	1	4	2	M	L

13.1.4 Contamination of Groundwater

Groundwater quality could be impacted through oil leakages, lubricants and grease from the construction equipment and machinery utilised during the construction of the power line.

Care must be taken to avoid contamination of soil and groundwater. Use drip trays when doing maintenance on machinery. Maintenance should be done on

dedicated areas with linings or concrete floor. The risk can be lowered further through proper training of staff.

All spills must be cleaned up immediately. excavations or dug holes should be backfilled and sealed with appropriate material, if it is not to be used further.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater	-VE	2	2	2	2	M	L

13.1.5 Contamination of Surface Water

Contamination of surface water (tributaries on site) might occur might occur through oil leakages, lubricants and grease from the construction equipment and machinery during the construction phase. Oil spills may form a film on water surfaces in the nearby streams causing physical damage to water-borne organisms.

Machinery should not be serviced at the site to avoid spills. All spills should be cleaned up as soon as possible. Hydrocarbon contaminated clothing or equipments should not be washed within 25m of any surface water body.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water	-VE	2	2	2	3	M	L

13.1.6 Generation of Waste

This can be in a form of concrete, rubble, electrical cuttings, litter etc. The impact is however expected to be minimal as construction will take place within the designated developmental footprint of 6Ha. Contaminated soil due to oil leakages, lubricants and grease from the construction equipment and machinery may also be generated during the construction activities.

The oil leakages, lubricants and grease must be addressed. Contaminated soil must be removed and disposed off at the hazardous waste landfill/cell. The contractor must provide containers on-site, to store any hazardous waste produced. Regular inspection and housekeeping procedure monitoring.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste	-VE	1	1	4	4	M	L

13.1.7 Traffic

The solar plant construction activities are expected to have a minor impact on the movement of traffic along the district road B2 road and the mine road. No diversion of traffic or closure of roads is expected.

Speed limit warning signs must be erected to minimise accidents. Heavy-duty vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	2	1	4	3	L	L

13.1.8 Fires and Explosions Risks

There should be sufficient water available for fire fighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test fire fighting equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Fires and Explosions	-VE	1	1	4	2	M	L

13.1.9 Nuisance and Visual Pollution Impacts

Aesthetics and inconvenience caused to persons trying to access/exit the site and surrounding areas. The supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Nuisance Pollution	-VE	1	1	2	2	L	L

13.1.10 Ecological Impacts

The proposed solar plant project is within an existing Karibib townlands, which is an already disturbed area, which is free of any conservation worthy vegetation (except *Parkinsonia africana*) and fauna. No major impacts on fauna and flora are expected as the site was previously cleared for grazing purposes. Disturbance of areas outside the designated working zone should be avoided. The developmental footprint is insignificant to the general area.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology	-VE	1	1	4	2	L	L

13.1.11 Avifaunal Impacts

On-site bird communities, particularly vulnerable and endangered species may be negatively affected due to habitat loss and disturbance (i.e. with the solar infrastructure). However, the loss of habitat and disturbance is unlikely to have any significantly negative impact on bird communities in the area. Disturbance activities, which bird species are generally able to adapt and co exist with, would occur mainly during the construction period. Presuming these

construction activities are limited to the developmental footprint, the extent of the impact will be local. Furthermore, the magnitude of this type of impact depends on the species concerned, the proportion of the study site affected, and the status of the habitat. Habitat loss would also occur primarily during the construction phase, primarily within the developmental footprint. The magnitude of habitat loss would vary depending on the species concerned, the proportion of the study site affected, and the status of the habitat currently on site (whether it is degraded or intact). This site has been de-bushed before for grazing purposes.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Avifauna	-VE	1	4	4	3	L	L

Summary of all potential impacts expected during the construction of the Solar PV Plant:

In general, impacts are expected to be low to medium, mostly short lived and site specific. Mitigation options recommended in the Environmental Management Plan (EMP) will guide and ensure that the impacts during the construction activities are minimised.

The contractor on site should be made aware of the content and environmental requirements of this report through proper induction training.

13.2 Operational Activities of the 5MW Solar PV Plant

13.2.1 Dust Pollution and Air Quality

Hydrocarbon vapours and dust will normally be released from maintenance vehicles at the site. Service roads will be maintained during the operational phase.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Dust & Air Quality	-VE	2	1	2	1	L	L

13.2.2 Noise Impact

Noise pollution already exists around the site in the form of noise generated from waste containing vehicles frequenting the site. Noise pollution due to this project is expected to be mainly from generator.

Ensure that generator engines are fitted with mufflers. Operators working in close proximity to the generators should be equipped with ear protection equipment, when noise becomes an issue. Observation of on-site noise levels by the Manager or Supervisor.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Noise	-VE	1	3	4	4	M	L

13.2.3 Contamination of Groundwater

Migration can place pollutants in close proximity to the water table in the unsaturated or saturated zones. Diffusion of this pollutants/gas into the water can cause changes in groundwater quality. However, all spillages in the operational phase will be cleaned up immediately to mitigate this impacts.

Potential health impact on groundwater users rarely exist. Potential impact on the natural environment from possible polluted groundwater rarely exits. The area is subjected to structures, which might act as preferential pathways for any contaminants entering the saturated zone.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Groundwater contamination	-VE	2	2	1	2	L	L

13.2.4 Contamination of Surface water

Spillages might occur during maintenance of the power line at the site. This may also occur during maintenance of vehicles used in the operational phase. Contaminated soil might pose a risk to surface water. All spills should be cleaned up as soon as possible. An emergency plan should be in place on how to deal with spills.

Drip trays and/or plastic sheeting should be used to contain any leaks emanating from the machinery and fleet.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Surface water contamination	-VE	2	2	1	2	L	L

13.2.5 Generation of Waste

Waste in the form of contaminated soil due to diesel spillages might be generated, but should be prevented. Contaminated soil must be removed and disposed off at the hazardous waste cell. Electrical cuttings generated during the operational phase, must be cleaned up along the power line and its way leave.

Contamination of soil and littering should be prevented through the use of proper containment equipment clean up of litter within the solar plant area and surroundings. A proper waste minimization policy should be formulated for this project by the METDECCI ENERGY INVESTMENT (PTY) LTD .

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Waste Generation	-VE	1	1	2	3	M	L

13.2.6 Failure of Solar Plant and its associated transmission power lines

Potential fire hazards and electrocution due to the nature of the power line/system failure. The result is a potential health hazard to vegetation in the area.

Power lines to be installed should be able to withstand heavy rain. Regular infrastructure inspection should be conducted.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Failure of Powerlines	-VE	1	1	4	2	L	L

13.2.7 Ecological Impacts

No major impacts are expected as the proposed solar plant is within an existing disturbed area. Minimise the area of disturbance by restricting movement to the designated working areas. Should there be bird mortalities found around the plant during maintenance, a bird specialist will have to be called in to advise on mitigation measures.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Ecology Impacts	-VE	1	1	4	2	L	L

13.2.8 Traffic

Traffic around the proposed site should be monitored, as to not damage the infrastructure. Speed limits and road signs as set out by METDECCI ENERGY INVESTMENT (PTY) LTD around the Solar Plant should be adhered to in order to minimise accidents. No major impacts on traffic is expected, as the power line runs mostly within farmlands.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Traffic	-VE	1	3	4	4	M	L

13.2.9 Safety and Security

Occupational exposures are normally related to electrocution and magnetic fields impacts. The contractor is advised to ensure that proper personal protective gear and first aid kits are available, at all times. Workers should also be properly trained in first aid and safety awareness. Methods statement must be approved by METDECCI ENERGY INVESTMENT (PTY) LTD environmental manager/officer or an appointed environmental consultant by METDECCI ENERGY INVESTMENT (PTY) LTD . Power line structures should be designed in a way that it does not encourage theft of panels and electric cables or its components.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Safety and Security	-VE	1	3	6	3	M	L

13.2.10 Avifaunal Impacts

On-site bird communities, particularly vulnerable and endangered species may be negatively affected due to habitat loss and disturbance (i.e. with the solar infrastructure). However, the loss of habitat and disturbance is unlikely to have any significantly negative impact on bird communities in the area. Disturbance activities, which bird species are generally able to adapt and co exist with, would occur mainly during the construction period. Presuming these construction activities are limited to the developmental footprint, the extent of the impact will be local. Furthermore, the magnitude of this type of impact depends on the species concerned, the proportion of the study site affected, and the status of the habitat. Habitat loss would not occur during the operational phase, as activities will be restricted to the developmental footprint. The magnitude of habitat loss would vary depending on the species concerned, the proportion of the study site affected, and the status of the habitat currently on site (whether it is degraded or intact). This site has been de-bushed before for grazing purposes. No further disturbances outside the working zones will be allowed.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Avifauna	-VE	1	4	4	3	L	L

13.2.11 Nuisance and Visual Pollution Impacts

Aesthetics and inconvenience caused to persons trying to access/exit the site and surrounding areas. The supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Nuisance Pollution	-VE	1	1	2	2	L	L

Summary of all potential impacts expected during the operations of the Solar PV Plant:

In general, impacts are expected to be low, short lived and site to local specific. Bird mortalities must be recorded along the power line during the operational phase. An Environmental Management Plan (EMP) will ensure that the impacts during the operational activities are minimised and includes measures to reduce all impacts identified.

The contractor should be made aware of the content and environmental requirements of this report through proper induction training.

13.3 Decommissioning Activities of the Solar PV Plant

The impacts associated with these activities will be similar to that of the construction phase. The Environmental Management Plan for this phase will have to be reviewed at the time of decommissioning to cater for changes made to the development.

Requirements during the decommissioning phase:

A rehabilitation plan for the site, including the indication of possible future use must be developed and kept on file within the facility. The type of rehabilitation adopted would be dependent on the planned future of the area. The following requirements however apply where the future use is no longer the transmission power line:

- ✓ When the associated transmission line is no longer used for transmission of power. These may be reused in other power transmission projects elsewhere or recycled;
- ✓ The owner of the facility at any given point in time, including the subsequent owner of the facility will remain responsible for any adverse impacts on the environment, even after operations have ceased;
- ✓ All remaining construction infrastructure, building rubble and waste are to be removed from the site;
- ✓ Use of topsoil for rehabilitation, that contains the seeds of alien vegetation, will not be permitted unless a program to germinate indigenous seed and eradicate alien seedlings is implemented;
- ✓ A grass mix should be selected for rehabilitation of disturbed open areas.

14. CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the Solar PV Plant project when added to other past, present, and reasonably foreseeable future actions regardless of what person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the construction and operational activities of the Solar PV Plant includes, noise emissions, land disturbance, traffic and possible accidents involving vehicles frequenting the premises. This could collectively impact on the environmental conditions in the area. Impacts associated with the railway, NAMPOWER substation and the Navachab mine could become significant, e.g. littering within the solar plant area, and creating a good opportunity for illegal logging due to cleared areas that were not accessible.

Impact Evaluation:

Aspect	Impact Type	Scale	Duration	Magnitude	Probability	Significance	
						Unmitigated	Mitigated
Cumulative impacts	-VE	1	3	4	3	L	L

15. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (**EMP**) provides management options to ensure impacts of the proposed Solar PV Plant are minimised. An EMP is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the power line project are prevented, and the positive benefits of the projects are enhanced.

The objectives of the EMP are:

- ✓ to include all components of the power line project;
- ✓ to prescribe the best practicable control methods to lessen the environmental impacts associated with the power line project;
- ✓ to monitor and audit the performance of the project personnel in applying such controls; and
- ✓ to ensure that appropriate environmental training is provided to responsible project personnel.

The EMP acts as a stand-alone document, which can be used during the various phases of the proposed project. All contractors taking part in the power line construction and operational activities should be made aware of the contents of the EMP. An EMP for the new Solar PV Plant project is attached as Appendix A.

16. CONCLUSIONS

All known environmental and social risks can be minimised and managed through implementing preventative measures and sound management systems. It is recommended that environmental performance be monitored regularly to ensure compliance and that corrective measures be taken if necessary. It is also recommended that this information be made available to the surrounding communities on a regular basis.

This proposed solar PV Plant is situated in an area that is unlikely to attract threatened bird species either frequently or in high concentrations. Solar Panels will be some of the only tall structures in the landscape, the pole tops will however still provide important perches for large birds, including eagles and vultures. It is therefore important that these pole topes do not present an electrocution risk to these birds. The ecologist has identified *Parkinsonia africana* as the only protected plant specie on site, this plant specie must avoided, conserved where possible. The contractor must be made aware of this protected vegetation.

In general, the new Solar PV Plant project would pose limited environmental risks, provided the EMP for the activity is used properly during planning and operations. The Environmental Management Plan should be used as an on-site tool during all phases of the power line project. Parties responsible for non-conformances of the EMP will be held responsible for any rehabilitation that may need to be undertaken.

Should the power line project be extended to a different area, it is recommended that a different EIA be done for the probable new location.

Matrix Consulting Services

Chris Ailonga (MSc Env Sci, Wits)
Environmental Scientist
July 2015

17. REFERENCES

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10 No.34416 GOVERNMENT GAZETTE, 1 JULY 2011(RSA)

APPENDIX A

Environmental Management Plan (EMP)

For the construction and operational phase

PROPOSED KARIBIB 5MW SOLAR PV PALNAT AND ITS ASSOCIATED TRANSMISSION LINE TO THE NAMPOWER KARIBIB DISTRIBUTION SUBSTATION

JULY 2015

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GLOSSARY

ALIEN INVASIVE PLANTS	Plants that do not naturally occur in an area. These plants are also referred to as exotic plants.
CONSTRUCTION ACTIVITY	Any action taken by the contractor, his sub-contractors, suppliers or personnel during the operational phase and possible decommissioning phase of the project.
ENVIRONMENT	an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.
ENVIRONMENMTAL CONTROL OFFICER	An individual nominated through the Project Manager to be present on site to act on behalf of the Project Manager in matters concerning the implementation and day to day monitoring of the EMP.
ENVIRONMENTAL MANAGEMENT	A management process which seeks to ensure, as far as possible, that no avoidable impact is caused to the environment and that when this is unavoidable that the consequences are understood prior to the impact being caused and that the impact is then mitigated as far as possible.
GROUNDWATER	Water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations
HAZARDOUS WASTE	Waste that poses substantial or potential threats to public health or the environment.
MITIGATION	The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts.
NO-GO AREA	Areas where all construction activities and related matters are prohibited.
POLLUTION	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.
REHABILITATION	Restoring the disturbed area to more or less the natural set up.
SITE	An area of ground where the solar pv plant is to be constructed.

1. INTRODUCTION and BACKGROUND

The aim of a construction and operational EMP is to ensure that all activities are done in an environmentally acceptable and safe manner. This Environmental Management Plan (EMP) serves as a managing tool for the construction and operation of the new 5MW Solar PV Plant in Karibib. The EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development.

The EMP serves as a guiding tool for the proponent, contractors and workforce on their roles and responsibilities concerning environmental management on site, and also provides an environmental monitoring framework for all project phases of the development. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

In this report, the Contractor refers to Metdecci Energy Investment (Pty) Ltd and its sub-contractors.

The purpose of the EMP is to:

- ✓ Train employees and contractors with regard to environmental obligations.
- ✓ Promote and encourage good environmental management practices.
- ✓ Outline responsibilities and roles of Metdecci Energy Investment (Pty) Ltd and its contractors in managing the environment.
- ✓ Describe all monitoring procedures required to identify environmental impacts.
- ✓ Minimise disturbance of the natural environment.
- ✓ Develop waste management practices.
- ✓ Prevent all forms of pollution.
- ✓ Protect the natural environment.
- ✓ Prevent soil and water erosion.
- ✓ Comply with all applicable laws, regulations and standards for environmental protection.

Phases covered by the EMP:
Construction Phase
Operational Phase

The construction phase of the new power line entails:

- o Transportation of relevant material.
- o Installation of solar panels and its associated transmission line.
- o Demarcation and fencing of temporary lay down areas
- o Clearing/trimming of vegetation (mostly invader species)

The operational phase will entail:

- o Management and monitoring of the solar pv plant.

- Maintenance of transmission line.
- Monitoring of bird mortalities within the plant.
- Clearing/trimming of vegetation periodically.

The decommissioning phase will entail:

- Removal of all infrastructure not reused in the future use of land.
- Re-use of transmission line by other operators
- Rehabilitation of disturbed environment.

2. LEGISLATIVE FRAMEWORK

➢ *National Legislative Requirements*

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1996, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislations are relevant to this project:

➢ *The Namibian Constitution*

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

➢ *Environmental Management Act No.7 of 2007*

This Act provides a list of projects requiring an Environmental assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

(a) to make sure that people consider the impact of activities on the environment carefully and in good time.

(b) to make sure that all interested or affected people have a chance to participate in environmental assessments

(c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

Line Ministry: Ministry of Environment and Tourism

- ***Atmosphere Pollution Prevention Ordinance (1976)***

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Line Ministry: Ministry of Environment and Tourism

- ***Water Resources Management Act of Namibia (2004)***

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

- ***Water Act No.54 of 1956***

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may

declare to be a watercourse. Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- ✓ Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and
- ✓ Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

- ➢ ***The Draft Wetland Policy (1993)***

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

Line Ministry: Ministry of Environment and Tourism

- ➢ ***Environmental Assessment Policy of Namibia (1995)***

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

Line Ministry: Ministry of Environment and Tourism

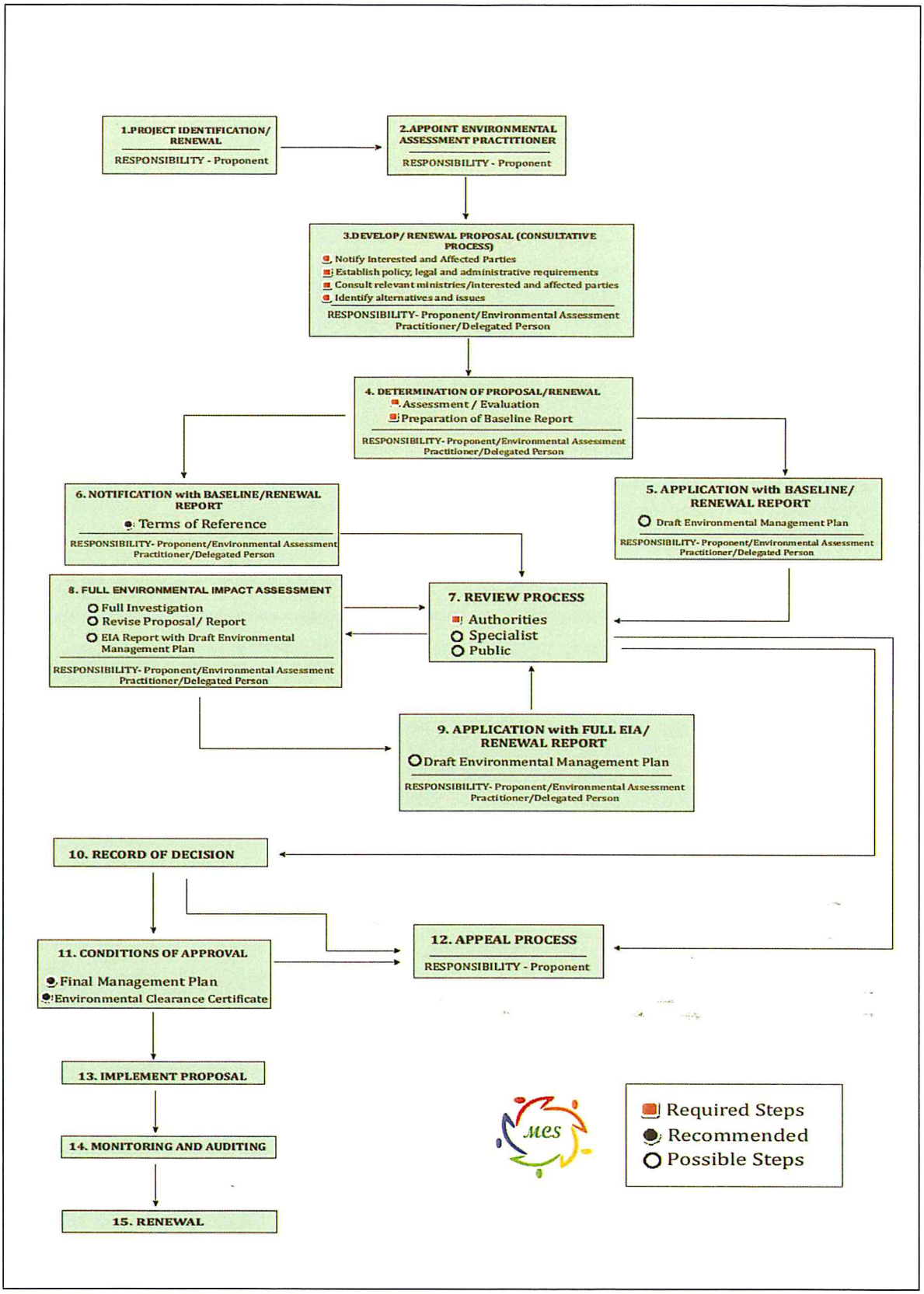

Figure 1: Environmental Assessment Procedure of Namibia *(Adapted from the Environmental Assessment Policy of 1995).*

- ***Draft Pollution Control and Waste Management Bill***

The proposed new 5MW Karibib Power Plant project, only applies to Parts 2 and 7 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

- ***Hazardous Substances Ordinance No. 14 of 1974***

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

- ***Public Health Act 36 of 1919 and Subsequent Amendments***

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the New Otavi Landfill project are expected to include dust, air quality impacts, noise nuisance and smoke emissions.

Line Ministry: Ministry of Health and Social Services

- ***International Conventions and Regulations***

Article 144 of the Namibian Constitution states that "the general rules of public international law and international agreements binding upon Namibia form part of the law of Namibia." This means that all the international agreements that Namibia signed become part of the law of our country. These laws and/or agreements are:

- ✓ Convention on Biological Diversity, 1992;
- ✓ United Nations Framework Convention on Climate Change, 1992;
- ✓ Kyoto Protocol on the Framework Convention on Climate Change, 1998;
- ✓ Stockholm Convention of Persistent Organic Pollutants, 2001.

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Locality and Land use

MetDecci Energy Investment (Pty) Ltd hereafter often referred to as the proponent is of the intention to erect a 5MW solar photovoltaic(PV) plant in Karibib townlands, that will connect to the existing NAMPOWER substation (900m away) in Karibib Metdecci Energy Investment (Pty) Ltd plans to erect a 5MW Solar PV Plant in Karibib. The Solar Plant is envisaged to have a developmental footprint of 6Ha. (See locality map: fig 2). The proposed Solar Plant Area is surrounded by small holdings, cemetery and undeveloped townlands.

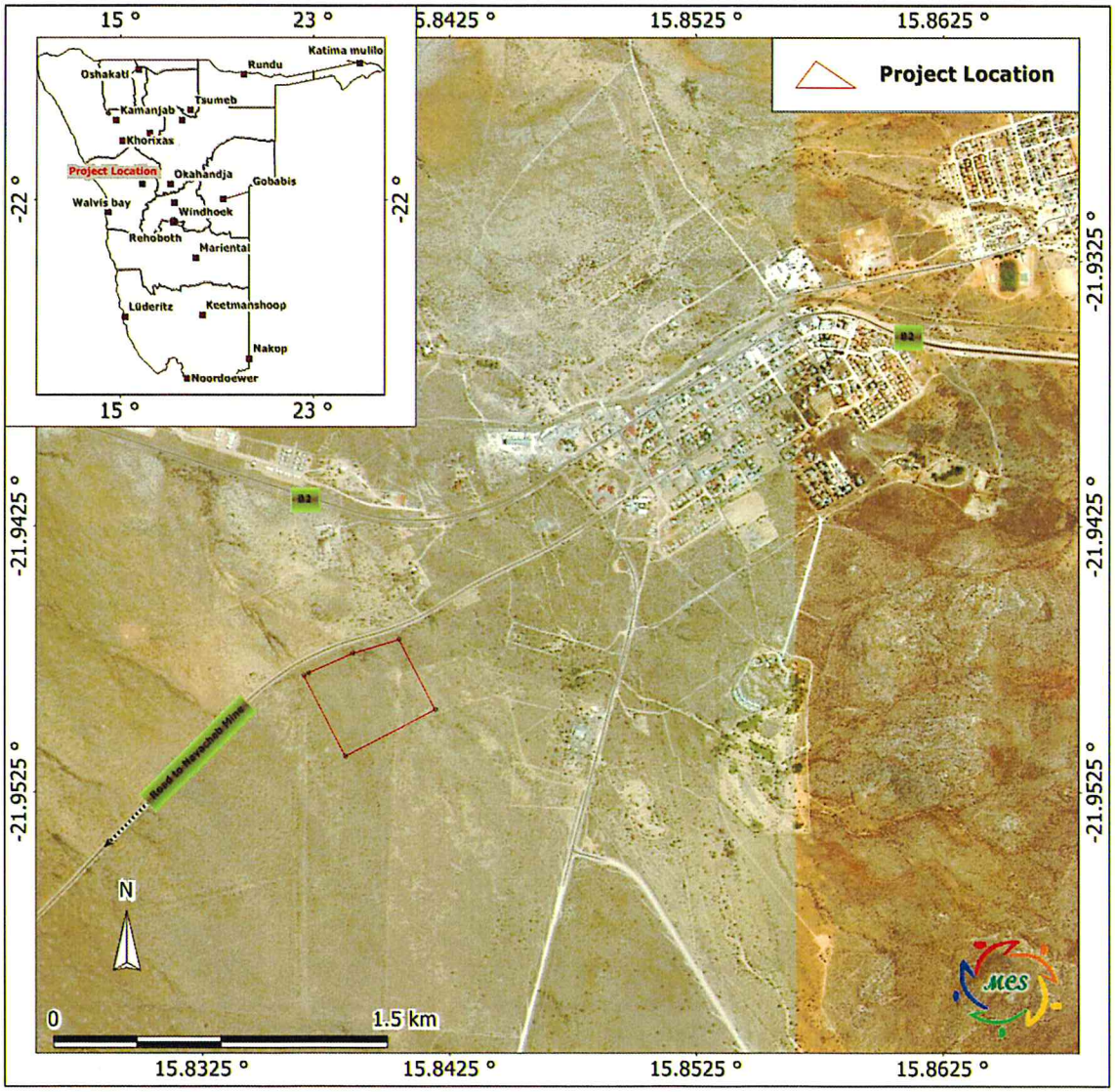

Figure 2. Locality map

3.2 Climate

Classification of climate:	Semi-arid area
Average rainfall:	Rainfall in the area is averaged to be between 200-250 mm per year.
Variation in rainfall:	Variation in rainfall is averaged to be 50-60 % per year.
Average evaporation:	Evaporation in the area is averaged to be between 2100-2240 mm per year.
Precipitation:	The highest summer rains are experienced in February.
Water Deficit:	Water deficit in the area is averaged to be between 2100-2300 mm per year.
Temperatures:	Temperatures in the area are averaged to be between 20- 22 °C per year.
Wind direction:	Wind directions in the area are predominantly easterly and southerly winds.

3.3 Geology and Hydrogeology

The area of Karibib is situated within the northern part of the Central Zone of the late Proterozoic Damara orogenic belt. The Damara Belt in central Namibia forms part of a system of Pan-African collisional belts in southern Africa that record the amalgamation of the Gondwana supercontinent in the latest Proterozoic and early Phanerozoic (Miller, 2008). The geological scenario in this area encompasses classical geosynclines metasedimentary and intrusive rocks belonging to the Damaran and Karoo Sequences, thus spanning more than 400 Ma of earth history. On the platform edges of the trough chiefly calcareous sediments were deposited. Both rock suites were subsequently folded and metamorphosed and granitic intrusion took place. Bands of marble and quartzite in these otherwise phyllitic metamorphic rocks are of hydrogeological significance. Several anorogenic complexes of Cretaceous age are present are present in the area. Karibib Carbonate Complex forms a prominent landmark. Also, numerous pinnacles of Damara granite and rounded quartzite hill rises above most of the flat landscape in the area (Miller, 2008; Schneider, 2004).

The geology of Karibib itself, consists mainly of marble, schist, quartzite, calc-silicate and graphitic schist of the Damara Sequence (Swakop Group) in the northern half of the town, whereas undifferentiated Damara granites are situated more in the

southern half of the town. As you drive out of town northward to Otjiwarongo, rocks of syn - to post-tectonic granite, granodiorite, monzonite and diorite are observed.

The groundwater potential of fractured aquifers in the Swakop Group of the Damara Sequence is generally low. However, the carbonates (marbles and limestones) are of moderate potential and at properly selected targets like fracture zones and karstified contact zones, even high yields can be found. This depends on the amount of rainfall and associated weathering and recharge. The most significant aquifer presently utilised is the marble aquifer north and north-east of Otjiwarongo. The water supply scheme relies on a fractured and slightly karstified marble band of the Karibib Formation, which allows medium to high pumping rates and supplies Group B water. The water supply scheme of Karibib is situated between Omaruru and Otjiwarongo in an area underlain by meta-sediments and granites of the Damara Sequence that have a low groundwater potential (Christelis and Struckmeier, 2001). Alluvial sediments of the Omaruru ephemeral River provide another good aquifer and a source of water for nearby urban centres and settlements including Karibib (Schneider, 2014).

Groundwater flow from the site can be expected in a south-westerly direction. Local flow patterns may vary due to groundwater abstraction in the area. According to the Department of Water Affairs (DWA) database, 7 boreholes are located within a 2km radius of the project location. The water table at the site is expected to between 10mbs and 30mbs. Water quality in the area is generally good and classified good quality water, according to Namibian drinking water quality standards

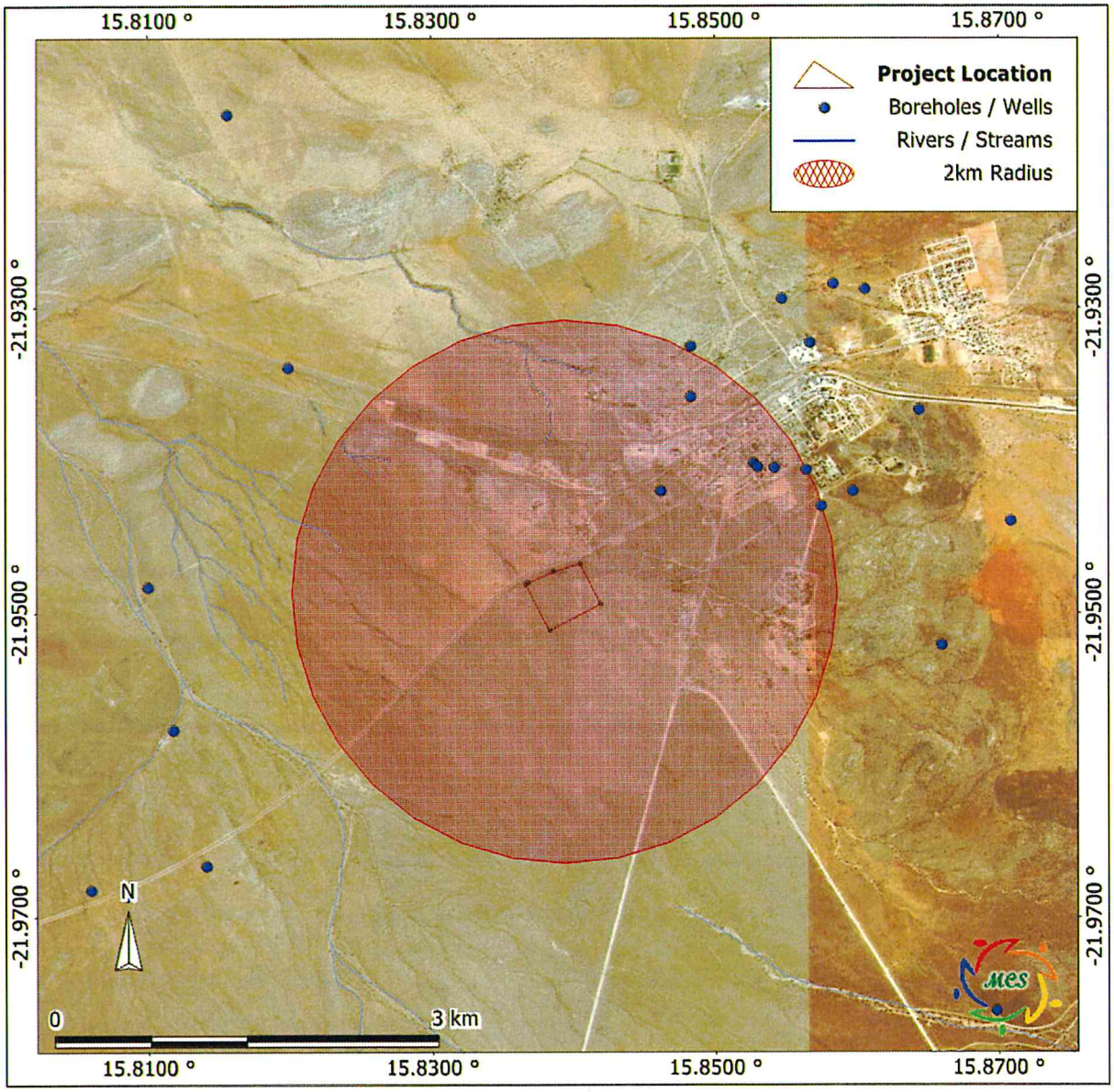

Figure 3: Groundwater in the study area

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 Responsibilities for environmental management

METDECCI ENERGY INVESTMENT (PTY) LTD will be responsible for environmental control on site during the operational phase. It is very important a pre-work briefing meeting be held at all times to reach an agreement on specific roles of various parties and penalties for non-compliance.

4.2 Training and induction

METDECCI ENERGY INVESTMENT (PTY) LTD is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily. METDECCI ENERGY INVESTMENT (PTY) LTD should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMP and that they will comply. All senior staff should familiarise themselves with the full contents of the EMP and its implications. Senior staffs (Foreman/Supervisor) are expected to train and assist the rest of the employees on the contents of the EMP.

It is imperative to ensure that all personnel have the appropriate level of environmental awareness to ensure continued environmental due diligence and ongoing minimisation of environmental harm.

To achieve efficient environmental management, it is important that workers, contractors and sub-contractors are aware of their responsibilities in terms of the relevant environmental legislation and the contents of this EMP.

METDECCI ENERGY INVESTMENT (PTY) LTD should ensure environmental awareness is enforced in order to:

- Promote environmental awareness amongst all employees on site,
- To inform workers of all environmental procedures, policies and programmes applicable,
- To provide generic training on the implementation of environmental management specifications; and

The environmental awareness training programme will include:

- The induction of all construction and operation workers;
- Proof of receiving and understanding the induction must be signed by all persons receiving the induction.

4.3 Environmental incident reporting

All environmental incidents occurring at the proposed site will be recorded. The incident report will have to include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighbouring community should be directed to the Technical Manager / Environmental Health Officer of METDECCI ENERGY INVESTMENT (PTY) LTD and channelled to the appointed ECO officer. METDECCI ENERGY INVESTMENT (PTY) LTD Management should be able to respond to the complainant within a week (even if pending further investigation). It is important that the issues raised are considered and that the complainant feels that their concerns have been addressed to and wherever possible actions taken to address these. All complaints should be entered in the environmental register and all responses and actions taken to address these should be recorded.

The following documents must be kept on site in order to record compliance with the EMP:

- Environmental authorisations
- Record of complaints.
- Monitoring results.
- Written corrective action instructions.
- Non-conformance reports.
- Notification of emergencies and incidents.

4.4 Environmental monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done in order to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command.

4.5 EMP administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

4.6 EMP amendments

The EMP amendments can only be made with the approval of the ECO officer and ultimately the DEA. Amendments to the EMP should be liaised to all employees and contractors.

4.6 Non compliance of the EMP

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

METDECCI ENERGY INVESTMENT (PTY) LTD is responsible for reporting non-conformance with the EMP, to the ECO officer. The management of METDECCI ENERGY INVESTMENT (PTY) LTD, in consultation with the ECO officer must, thereafter, undertake the following activities:

- ✓ Investigate and identify the cause of non-conformance.
- ✓ Report matters of non-conformance to METDECCI ENERGY INVESTMENT (PTY) LTD Project Engineer and MET (depending on the severity of the incident).
- ✓ Implement suitable corrective action as well as prevent recurrence of the incident.
- ✓ Assign responsibility for corrective and preventative action.
- ✓ Any corrective action taken to eliminate the causes of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

4.7 Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent neighbours. It should also contain information relating to actions taken. Any party on site may complete the register, however, it is envisaged that the Technical Manager, the contractor and the ECO officer will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

4.8 Environmental Control Officer

The Environmental Control Officer for the site will be an independent environmental consultant appointed by METDECCI ENERGY INVESTMENT (PTY) LTD to monitor and review the on-site environmental management and implementation of this EMP.

Duties of the ECO officer:

- ✓ The identification of potential environmental impacts, prior to the onset of decommissioning. A site visit may also be required prior to site development. This would be carried out in consultation with the Technical Manager.
- ✓ Providing of an environmental register at the site to be filled in by any person reporting an environmental incident, issue or concern and inspected by the ECO officer on a regular basis to check for issues raised and actions taken.
- ✓ Ensuring that the EMP conditions are adhered to at all times and taking action.
- ✓ Ensuring that environmental impacts are kept to a minimum.

- ✓ Reviewing and approving method statements in consultation with the Technical Manager.
- ✓ Reporting to METDECCI ENERGY INVESTMENT (PTY) LTD and the Technical Manager on a regular basis and advising of any major environmental impacts. Attending the site meetings (when necessary)
- ✓ Inspecting the site and surrounding areas regularly, and monitoring an ongoing environmental awareness program in conjunction with the Technical Manager.
- ✓ Requesting the removal of people and/or equipment not complying with the specifications of EMP.
- ✓ Keeping both a written and photographic record of progress on site from an environmental perspective, and an ad hoc record of all environmental incidents
- ✓ Undertaking continual review of the EMP and submitting a report to the relevant stakeholders.
- ✓ The ECO officer will submit all written instructions and verbal requests to METDECCI ENERGY INVESTMENT (PTY) LTD via the Technical Manager and Project Engineer.

4.9 Contractors and Service Providers

All contractors (including subcontractors and staff) and service providers are ultimately responsible for:

- o Organizing that all his employees and those of his subcontractors receive training before the commencement of construction in order that they are aware of the terms of reference of the EMP.
- o Complying with the environmental management specifications.
- o Submitting Methods Statements for specific activities controlled by the EMP for approval by the ECO before any work is undertaken.
- o Adhering to any instructions issued by the Project Manager on the advice of the ECO.
- o Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting.
- o Displaying the list of EMP transgressions issued by the ECO officer on site.
- o Maintaining a public complaints register on site.

4.10 Site Management

Areas outside this designated working zone shall be considered "no go" areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the site.

4.10.1.1 Access routes and work sites

Road transport trucks will access the site via the Navachb mine road. No new tracks/roads shall be established and only existing roads may be used. Work sites shall be clearly demarcated and road signs erected were needed. The general public should not have unauthorised/uncontrolled access to the site during decommissioning and operational phase.

The camp entrance will be manned during the operation hours, but will be lockable to prevent unauthorised entry. Suitable signs must also be erected on the approach roads and on-site, to direct drivers and to control speed.

Road access to the working zones of the project must be maintained at all times in a manner suitable to accommodate vehicles normally expected to use the facility. Roads must be regularly graded and wetted to control dust, where necessary.

4.10.1.2 Fire and safety management

Should there be a need for electrical wiring at the facility in future, it must be approved by a qualified electrician/electrical engineer who will issue a Certificate of Compliance.

This site does not in any way accommodate hazardous waste (e.g. hydrocarbons, paint, pesticides, mercury, batteries, radioactive waste e.t.c.) disposal. Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

No fire, whether for cooking or any other purpose, is to be made at site during any of the three phases (construction, operational and decommissioning). The Contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers. The Contractor should be prepared for such events.

The METDECCI ENERGY INVESTMENT (PTY) LTD management together with contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

4.10.1.3 Staff management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid. Training records must be kept for future references.

4.10.1.4 Waste management

Construction rubble shall be disposed of in pre-agreed demarcated dumps that have been approved by the neighbouring local authority. To reduce littering impacts, refuse bins must be placed at strategic locations to ensure that litter does not accumulate within the construction site. All windblown litter must be collected by hand around the site on a daily/weekly basis depending on the severity.

Regular housekeeping is encouraged regularly. Skip containers on site must be maintained at all times, and they must be animal proof and arrangements must be made regular collection with the nearest local authority or private waste removal contractors.

All hazardous materials must either be stored in a bunded or lined areas and then disposed of at an approved hazardous waste site. It remains the contractor's responsibility to install mobile toilets on site. The ablution facilities must 100m away from working zones and 60m away from any surface or groundwater resource. Spills must be cleaned up immediately and disposed at an appropriate landfill or bio-remediated.

4.10.1.5 Cement and concrete batching

Concrete mixing directly on the ground shall not be allowed and shall take place on an impermeable surface. All run-off from batching areas shall be strictly controlled, and cement contaminated water shall be collected, stored and disposed of at a licensed suitable waste disposal facility.

4.10.1.6 Hydrocarbons management

If any spillage occurs, contaminated soil shall be collected in a holding tray or drum and which will then disposed at a **hazardous waste disposal site**. Any spillage of more than 200 litres must be reported to the Ministry of Mines and Energy as per the Petroleum Products Act.

The Contractor shall take all reasonable measures to prevent surface or groundwater pollution from the release of oils and fuels.

4.10.1.7 Information board

The Contractor will be responsible for erecting information boards on site. The number and locations of these boards shall be agreed upon by the ECO officer.

The contents of the information board shall be provided by the Technical Manager and will essentially be to advise the public of the construction activity and the prohibition on entering certain areas. The information board shall also provide the contact number of the ECO, to ensure that the public can access

relevant information and lodge any complaints during construction and operational phase of the power line.

4.10.1.8 Flood management

The power line will be designed in a way that it can withstand flood. Storm water management of the site should be a key aspect of flood management on site. The site must be managed in order to prevent pollution of drains, downstream watercourse or groundwater due to suspended solids, silt or pollutants.

4.10.1.9 Progressive Rehabilitation

All final levels and slopes must be in conformance with the design and the end-use plan, with slopes no steeper than 1:3. Rehabilitation must commence as soon as possible on areas where no further construction is to take place. Once the final level is achieved the area must be capped and covered with the final cover indigenous vegetation.

4.10.2 Management of environmental aspects during all phases of the project

Groundwater

Construction/Decommissioning phase	
Description	Groundwater contamination can be caused by leakages and spills of fuel from machinery and heavy-duty vehicles during the decommissioning phase. Care must be taken to avoid contamination of soil and groundwater.
Proposed Mitigation Measures	Prevent spillages of any chemical or fuel. Use drip trays when doing maintenance on machinery. Maintenance should be done on dedicated areas with linings or concrete floor. No maintenance of machinery may be done at the site. All Storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund wall must be high enough to contain a minimum of 110% of the total volume of the stored hazardous materials. All hazardous materials must be stored 50m away from surface water bodies. Contaminated waste water must be managed to ensure or prevention of groundwater pollution. Cement contaminated water must not enter the water system as this disturbs the natural acidity of the soil and affects plant growth. Workers will not be allowed to use any open water body or natural water source for the purpose of bathing, washing of clothing or for any construction related activities. The site must be managed in order to prevent pollution of drains, downstream watercourses, due to suspended solids, silt or pollutants.
Proposed Monitoring	Regular visual inspection.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Spillages from machinery might occur during maintenance.
Proposed Mitigation Measures	The risk can be lowered further through proper training of staff. All spills must be cleaned up immediately.The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.
Proposed Monitoring	Sampling the nearest boreholes in the area for pollution when any significant water quality changes have been reported.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD

Surface Water and Stormwater

Construction/Decommissioning phase	
Description	Leakage from machinery during the decommissioning phase. Oil Spills from heavy equipment and machinery may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could be impaired.
Proposed Mitigation Measures	Machinery should not be serviced on site to avoid spills. All spills should be cleaned up as soon as possible. Hydrocarbon/chemical contaminated soil; clothing or equipments should not be washed within 25m of any surface water. The site must be managed in order to prevent pollution of drains, downstream watercourses, due to suspended solids, silt or pollutants. Earth, stone and rubble is to be properly disposed of so as not to obstruct natural water path ways (rivers, drainage line, stormwater channels) over the site.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Spillages might occur during the maintenance of the solar plant and its associated infrastructure. Contaminated soil might pose a risk to surface water bodies in the area in case of huge spill.
Proposed Mitigation Measures	All spills should be cleaned up as soon as possible. The presence of an emergency response plan and suitable equipment is advised, so as to react to any spillage or leakages properly and efficiently.
Proposed Monitoring	Regular visual inspection. Surface water monitoring sampling for hydrocarbon pollution.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD

Air quality (including dust)

Construction/Decommissioning phase	
Description	Dust may be produced during the construction phase; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a nuisance to the neighbouring properties. The possible decommissioning of the power line will have minimal impact on the surrounding air quality.
Proposed Mitigation Measures	Excavation, handling and transport of materials must be avoided under high wind conditions. During high winds, dust suppression measures may be required (e.g. dampening with water). Retention of vegetation where possible will reduce dust travel. speed limits of 20km/h must be enforced on dirt roads. To reduce odour impacts, regular servicing of vehicles in order to limit gaseous emissions (off-site), and regular servicing of on-site toilets to avoid potential odours. LP Gas cookers may be used , to ensure safety and avoid fires. No open fires
Proposed Monitoring	Regular visual inspection.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Dust and odour will normally be released during maintenance of vehicles.
Proposed Mitigation Measures	Vehicles idling time shall be minimised by putting up educative signs. To reduce odour impacts, regular servicing of vehicles in order to limit gaseous emissions (off-site).
Proposed Monitoring	A complaints register regarding dust/emissions/odour should be kept and acted on if it becomes a regular complaint.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Health and Safety

Construction/Decommissioning phase	
Description	During the construction and decommissioning phase, earthmoving equipment will be used on site. This increases the possibility of injuries. The presence of equipment lying around on site may encourage criminal activities (theft). Veld fires could also be an issue on site.
Proposed Mitigation Measures	Equipment and machinery operators should be equipped with ear protection equipment. Operations should be strictly between 07H00 to 19H00. First aid and safety awareness training for contractors. Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. The staff must be properly trained on safety and health issues of the project. Workers should be fully equipped with personal protective equipment gear. No cooking in the open may be allowed to avoid veld fires.
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	The operations of the Solar PV Plant can cause health and safety risks to workers on site and the neighbouring communities. Occupational exposures are normally related to inhalation of harmful vapours and physical contact with pollutants or electrocution.
Proposed Mitigation Measures	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises. Operators must be properly trained on safety and health issues of the project, including HIV/AIDS. Well stocked first aid box which is readily available and accessible should be provided on site. Signs such as 'NO SMOKING' must be prominently displayed in parts where flammable materials are stored on the site. Workers should be fully equipped with personal protective equipment gear. It is not recommended that humans live under power lines due to the effects of electro magnetic fields (EMF).
Proposed Monitoring	Regular inspection and incident monitoring report evaluation.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Noise Pollution

Construction/Decommissioning phase	
Description	Noise pollution due to heavy-duty equipment and machinery on site. Noise emanating from excavating and site clearing activities.
Proposed Mitigation Measures	Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. Ensure engines of machinery are fitted with mufflers. Equipment and machinery operators should be equipped with ear protection equipment. Operations should be strictly between 07H00 to 19H00. Noise from labourers must be controlled.
Proposed Monitoring	Strict operational times. Regular inspection.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Noise pollution generated from vehicles accessing the plant and those using the navachab mine road.
Proposed Mitigation Measures	Sensitize maintenance vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. Ensure engines of machinery are fitted with mufflers. Equipment and machinery operators should be equipped with ear protection equipment. Operations should be strictly between 07H00 to 19H00. Noise from labourers must be controlled. Loud music from vehicles loading should be restricted.
Proposed Monitoring	Strict delivery and collection times. Observation of on-site noise levels by the Site Manager or Supervisor.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Waste Generation

Construction/Decommissioning phase	
Description	This can be in a form of contaminated soil, building rubble , hazardous waste and domestic waste disposed.
Proposed Mitigation Measures	Ensure that no excavated soil, refuse or building rubble generated on site are placed, dumped or deposited on adjacent/surrounding properties or land. All waste must be taken away from site and disposed of at an approved waste disposal site. Construction rubble shall be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the relevant local authority. Regular housekeeping and waste skips maintenance must be enforced during the construction phase. The skips must be animal-proof , and arrangements for them to be picked up regularly should be in place. All hazardous waste materials must either be stored in a bunded or lined area, and then disposed at an appropriates hazardous waste disposal site. The contractor must install mobile toilets on site, which should at least be within 100m from working zones, but not 60m closer to any surface water body or boreholes. Contaminated soil can be bio-remediated or excavated and disposed of at an approved hazardous landfill.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the manager.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Waste in the form of contaminated soil, rubble and domestic waste. Littering along access roads may also be produced during the operational phase.
Proposed Mitigation Measures	Waste minimization policy should be formulated by METDECCI ENERGY INVESTMENT (PTY) LTD. Burning of waste material is not allowed. Regular maintenance and housekeeping of the access roads. No hazardous waste may be disposed off at the Site. Contaminated soil can be bio-remediated or excavated and disposed of at an approved hazardous landfill.
Proposed Monitoring	Regular visual inspection.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD (Site Manager)

Traffic

Construction/Decommissioning phase	
Description	Construction site related activities are expected to have a minimal impact on the movement of traffic along B1 road and the navachab mine road . Diversion of traffic or closure of roads is not expected.
Proposed Mitigation Measures	It is recommended that if the need arises for traffic diversion or road closure, the METDECCI ENERGY INVESTMENT (PTY) LTD should liaise with the relevant authorities. Speed limit and site warning signs must be erected to minimise accidents. Construction vehicles must be tagged with reflective signs or tapes to maximise visibility of the vehicles and avoid accidents.
Proposed Monitoring	Observations of the traffic flow on the mine road and B2 road.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Traffic around the solar PV plant and the navachab mine road
Proposed Mitigation Measures	Maintenance vehicles should be limited to normal working hours (07h00 to 19h00).
Proposed Monitoring	Strict working times monitoring. Observation of traffic by the Site Manager or Supervisor.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Ecological impacts

Construction/Decommissioning phase	
Description	The location of the power line is free of any conservation worthy terrestrial vegetation (except for *Parkinson africana*) and fauna. Impacts on fauna and flora are expected to be low, as the area is previously disturbed, which visible signs of disturbance. Parkinson Africana specie should be avoided, conserved as much as possible.
Proposed Mitigation Measures	The site has been previously disturbed and cleared to be used as a grazing area. Prevent surface water contamination and disturbance of areas outside the designated working zone. Construction sand must not be obtained from any river tributary on site. If a nest of large is found in the construction phase, a bird specialist must be contacted to remove them.
Proposed Monitoring	Regular site inspection by the Site Manager or Supervisor.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Disturbance or impacts on fauna and flora. Very little impacts are expected as the area is already disturbed and earmarked for the servitude.
Proposed Mitigation Measures	Prevent surface water contamination and disturbance of areas outside the designated working zone.
Proposed Monitoring	Regular site inspection by the Site Manager or Supervisor.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Spillages, leakages from trucks and vehicles

Operational phase	
Description	Fuel leakages and spillages may take place from vehicles frequenting the site during maintenance.
Proposed Mitigation Measures	This impact can be reduced by using drip trays, servicing of vehicles regularly and through proper training of the operators.
Proposed Monitoring	Regular inspection of vehicle conditions frequenting the site by the Technical Manager or Supervisor.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Avifaunal impacts

Construction/Decommissioning phase	
Description	Impacts on birds breeding, foraging and roosting in or in close proximity of the site the modification of habitat.
Proposed Mitigation Measures	The site has been previously disturbed and cleared to be used as grazing land. No new areas will cleared, and all works must be restricted to the rail servitude. Those areas surrounding the construction site that are not part of the demarcated development area should be considered as "no-go" areas for employees, machinery or even visitors. Construction workers must also be trained in awareness of priority species (i.e. Black Stork, Secretary bird, Martial Eagle, Booted Eagle, African Fish-Eagle, Peregrine Falcon, Lanner Falcon, Kori Bustard, Ludwig's Bustard and Red Lark) in the event that a ground-based nest is discovered.
Proposed Monitoring	Regular site inspection by the Site Manager or Supervisor.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Operational phase	
Description	Bird collisions with powerlines and possible bird electrocutions.
Proposed Mitigation Measures	The transmission lines will be buried underground, thus reducing the risks of bird electrocution.
Proposed Monitoring	Regular site inspection by the Site Manager or Supervisor.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

Nuisance Pollution

Construction/Decommissioning phase	
Description	Aesthetics and inconvenience caused to person trying to access/exit the site.
Proposed Mitigation Measures	The Technical Manager or Supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	METDECCI ENERGY INVESTMENT (PTY) LTD/Contractors

Fire and explosion hazard

Operational phase	
Description	Most hydrocarbon products are volatile under certain conditions and their vapours in specific concentrations and conditions are flammable. Dry cleared vegetation is flammable.
Proposed Mitigation Measures	There should be sufficient water available for fire fighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Vegetation under the solar must maintained and trimmed to a maximum height of 0.7m.
Proposed Monitoring	Regular inspections should be carried out to inspect and test fire fighting equipment. Perform mock fire exercises to monitor the employees' preparedness for real fire events.
Responsible Body	METDECCI ENERGY INVESTMENT (PTY) LTD

5. CONCLUSIONS

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental officer/consultant will need to monitor or audit the site throughout the construction, operation and possible decommissioning phase to ensure that the EMP is fully implemented and complied with. The EMP caters for all project phases, but will need to be reviewed during all phases of project, especially when revisions are made to the project development plans.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed project. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Clearance certificates issued on EIA/EMPs are only valid for 3 years and will need to be reviewed and submitted to the Department of Environmental Affairs again for approval. It is the responsibility of the proponent to initiate the renewal process.

Matrix Consulting Services

C. Ailonga (MSc Env Sci, Wits)
Environmental Specialist
July 2015

APPENDIX B

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED METDECCI KARIBIB 5 MW SOLAR (PV)PLANT AND ITS ASSOCIATED 900M TRASMISSION LINE (11Kv) FROM THE PLANT TO THE NAMPOWER DISTRIBUTION STATION, KARBIB
ERONGO REGION

BACKGROUND INFORMATION DOCUMENT (BID)

1. Purpose of this Document

The purpose of this Background Information Document is to brief stakeholders, interested and affected parties about the Environmental Impact Assessment being undertaken for the proposed MetDecci Karibib Solar (PV) Plant in Karibib.

This is part of the public participation process, where interested and affected parties are given the opportunity to register as stakeholders, and to raise their issues, make comments and contribute towards the proposed project.

2. Background Information

Solar power is the conversion of sunlight into electricity, either directly using photovoltaics (PV), or indirectly using concentrated solar power (CSP). This Project will use the photovoltaics system.

MetDecci Energy Investment (Pty) Ltd hereafter often referred to as the proponent is of the intention to erect a Solar Power Plant (5MW) that will connect to the existing Nampower Karibib Power Station in Karibib. The proposed project will be located along the Navachab Mine road, on 15ha plot provided by the Karibib Town Council. The actual area to be covered with solar panels is only 6ha, and the rest of the area remains undeveloped. The transmission power line from the plant will be 900m long, and running mostly parallel to the road, this transmission line is envisaged to be underground. This was done to reduce any further cumulative effects of overhead power lines on bird life.

The plant is envisaged to be installed as follows:

Number of PV Modules: **19008 pieces**

Modules Inclination: **24°**

Distance from the fence: **5m**

Type of Modules: **260Wp Mono**

Structure type: **Solar PV panels, on a structured steel screw peg, instead of using concrete foundations.**

The generation of electricity, transmission and supply of electricity are *'listed activities'* as per the *'List of Environmental activities' needing Environmental Clearance* (Government Notice No.1 April 2008) and accordingly requires and Environmental Impact Assessment (EIA) to be conducted.

The Proponent commissioned this EIA and appointed Matrix Consulting Services to undertake the necessary activities to enable an application for an Environmental Clearance with the Environmental Commissioner as prescribed by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012).

In line with Regulation 21(2) of the mentioned EIA Regulations, this Background Information Document (BID) is distributed to Interested and Affected Parties as part of the public consultation process for this Environmental Impact Assessment.

An assessment will be undertaken to determine the potential impact of the development on the environment and to determine all safety, health and social impacts associated with the proposed activities of the development.

The environmental assessment will be conducted as per Namibia's Environmental Assessment Policy (1995) and the Environmental Management Act No.7 of 2007.

3. Locality Map

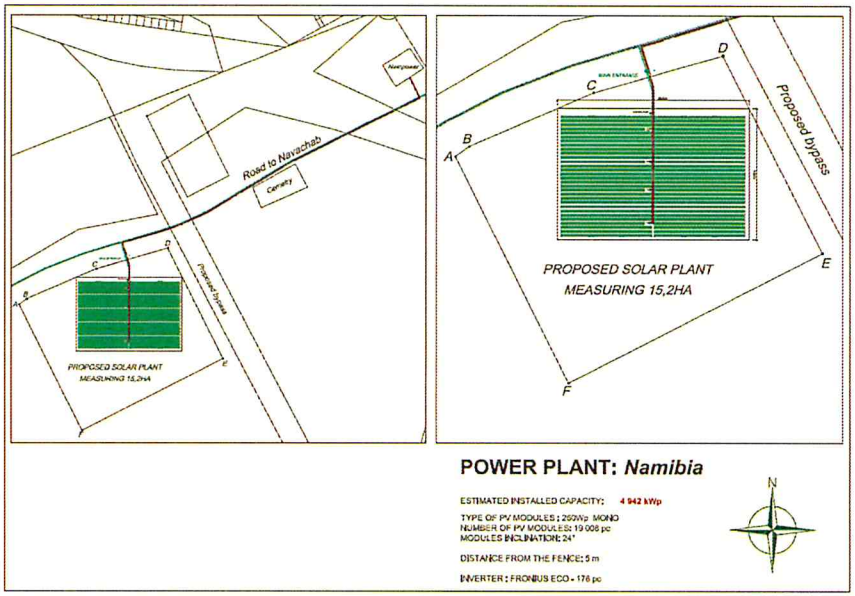

Fig 1: Location Map

4. Potential Environmental Issues to be considered

- Emissions from vehicles (gaseous and particulates)
- Noise emissions during construction
- Potential Avifauna conflicts
- Removal/disturbance of fauna and flora
- Waste generations during construction
- Increase in Traffic

- Soil contamination at lay down areas
- Possible pollution of surface/groundwater
- Possible damage to archaeological objects if any is found
- Employment opportunities

5. Pre identified Pros and Cons

Pros:

- ✓ Provision of electricity to the local grid
- ✓ Few jobs created during construction (temporary) and operation (permanent).
- ✓ Diversification of economic activities within the mining town of Karibib.
- ✓ Cleaner energy production.

Cons:

- ✓ Visual impact on receptors in adjacent areas.
- ✓ Loss of land for residential development.

6. Intended Development

The proposed solar power plant serves to address the current power shortage in the country. Some of the power is still being supplied from neighbouring countries to supplement the power demand. Providing reliable power supply for the increasing economic developments in Namibia has proved to be a challenge. Therefore there is an urgent need to provide alternative power supply sources to supplement Nampower, to prevent any inconveniences or power cuts that may arise thereof.

7. Environmental Assessment Process

- ➢ Establishing environmental risks of the intended project
- ➢ Establishing mitigation protocol
- ➢ Preparing the draft EIA & EMP
- ➢ Public reviewing of draft EIA & EMP
- ➢ Preparing the final EIA & EMP and submitting to MET
- ➢ Awaiting decision from Authorities
- ➢ Communicating decision to Interested & Affected Parties
- ➢ Availing opportunities to Appeal.

8. Public Participation

The Environmental Impact Assessment process involves interaction with neighbours, land owners, regional and local authorities, government ministries, and persons who are interested in, or who could be affected by the proposed new solar power plant and all related activities.

The purpose of the interaction will be to allow the public to participate by raising their issues and concerns as well as suggestions regarding the proposed project.

9. All Stakeholder/Interested & Affected Parties (I&AP)

Public participation process gives you the opportunity to:

- Attend meetings and obtain information about the proposed project
- Raise any environmental issues relating to the project

How can you be involved?

- By responding to the invitation advertised in any local newspaper
- By registering as an I&AP, for your name to be added to our register list
- Submitting your comments or requests
- By attending the public meeting held during the EIA process.

We are inviting the public to participate by contributing issues and suggestions regarding the proposed project before 06 April 2015.

PUBLIC INVITATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED 5MW METDECCI KARIBIB SOLAR (PV) PLANT, KARIBIB

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Project Location: Karibib Townlands, Erongo Region, along the Navachab mine road.

Project Description: Development of a 5MW MetDecci Karibib Solar (PV) plant over a 6ha area with an associated 1 km 11Kv transmission line to the Nampower Substation.

Proponent: MetDecci Energy Investment (Pty) Ltd

Environmental Consultant: Matrix Consulting Services

Matrix Consulting Services has been appointed by MetDecci Energy Investment (Pty) Ltd to conduct an Environmental Impact Assessment and Environmental Management Plan for the proposed development. A public meeting about the development will be held at:

Venue: **Usab Community Hall in Karibib.**
Date: **30 March 2015**
Time: **17h15**

All I&APs are encouraged to register and raise concerns or provide comments and opinions. All I&APs will be provided with a Background Information Document (BID) comprising detailed information for the intended activity and will be informed of the public participation process to be followed. Should you wish to register as an I&AP and receive a BID, please contact the Matrix Consulting Services office.

Contact: Mr. C. AILONGA,
Tel: (+264-61) 224197, **E-Mail:** karibibpv@matrixconsultingcc.com

DEADLINE FOR COMMENTS IS 06 APRIL 2015

(Please complete register on the next page)

10. Registration and Comments

Please fill in particulars and return completed document to be registered as an Interested & Affected Parties (I&AP) to:

Participant Name:	**Organization/Affiliations:**
Position:	**Telephone:**
Fax:	**E-Mail:**

Postal Address:

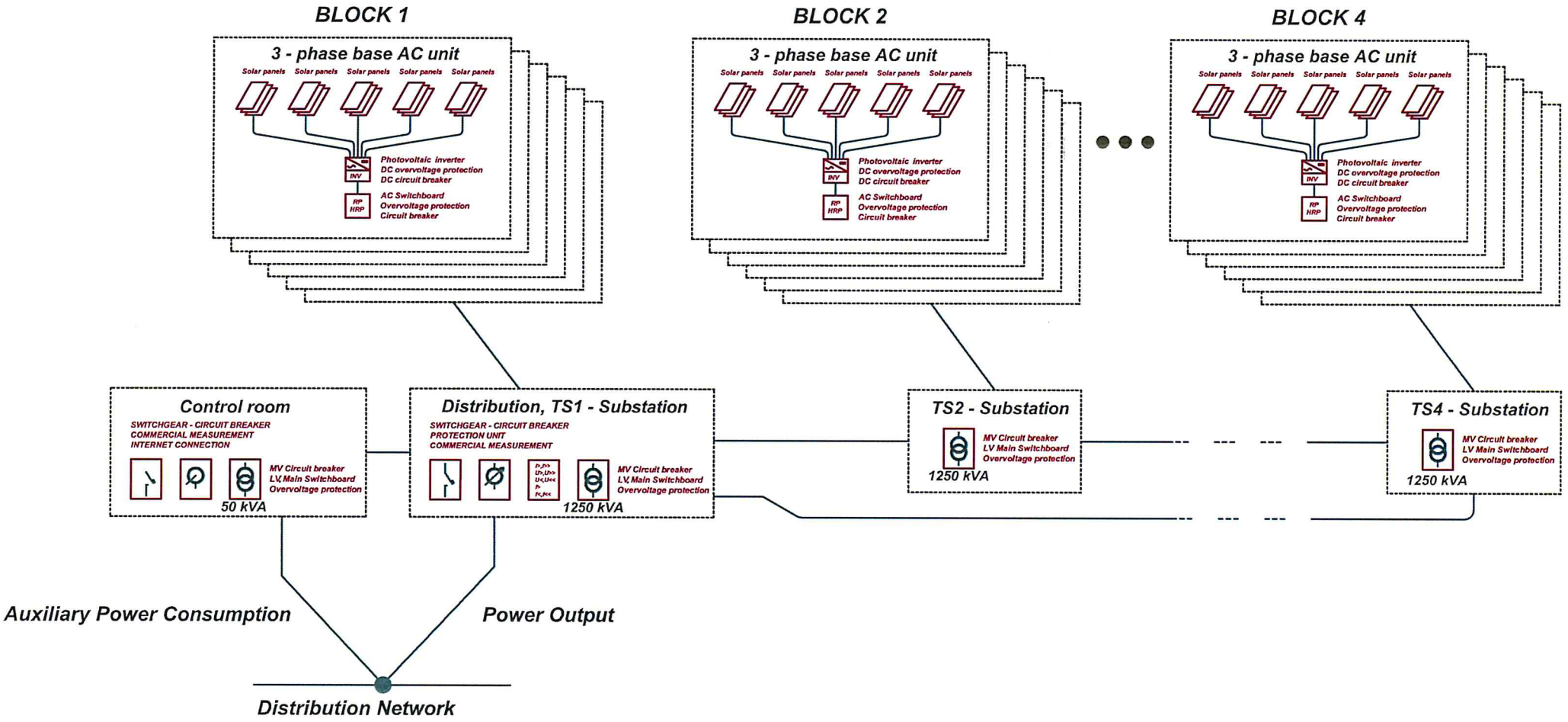
Comments/Suggestions and Questions:

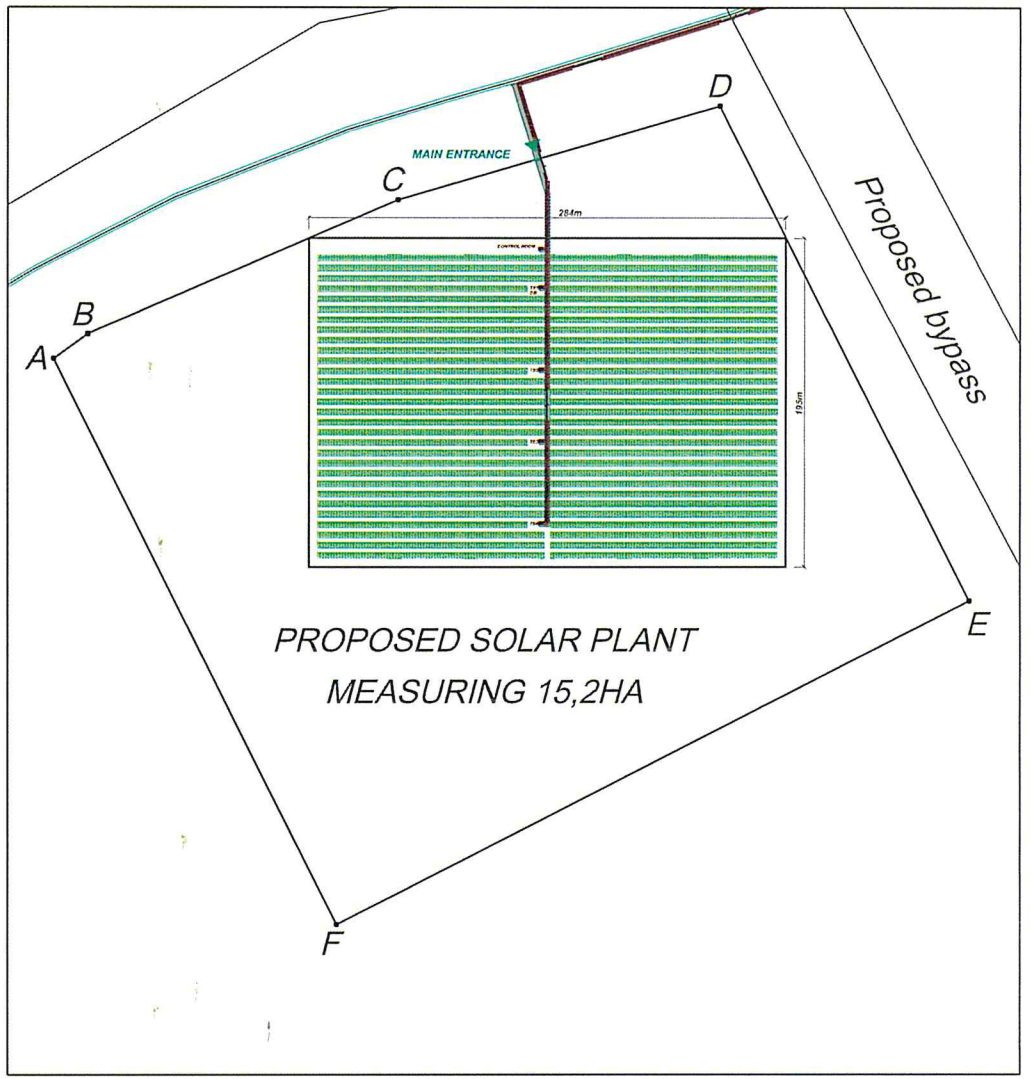
Tel: +264 61 224197
Fax: +264 61 212165
E-Mail: karibibpv@matrixconsultingcc.com

Contact Person:	Mr. C. Ailonga
Position:	EIA Project Manager

APPENDIX C

Photovoltaic Power Plant - Namibia 4 942 kWp





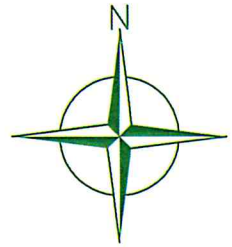
POWER PLANT: *Namibia*

ESTIMATED INSTALLED CAPACITY: **4 942 kWp**

TYPE OF PV MODULES : 260Wp MONO
NUMBER OF PV MODULES: 19 008 pc
MODULES INCLINATION: 24°

DISTANCE FROM THE FENCE: 5 m

INVERTER : FRONIUS ECO - 176 pc



APPENDIX D

POLYTECHNIC OF NAMIBIA
transforming to Namibia University of Science and Technology

HAROLD PUPKEWITZ GRADUATE SCHOOL OF BUSINESS (HP-GSB)
Namibia's Business School Of Choice

20 Years of Excellence – Polytechnic of Namibia

PUBLIC LECTURE

OPEN DATA FOR SUSTAINABLE DEVELOPMENT

with

DR ZORAN MITROVIC

ABOUT THE PRESENTER

Dr Zoran Mitrovic

Dr Zoran Mitrovic holds a MCom (IS Management) and DTech (Informatics). He is currently a Senior Lecturer at the Department of Information Systems (UWC) and a Managing Director and Head of Research at the Mitrovic Development and Research Institute (MDRI). His career of over 40 years includes extensive corporate management, consulting, research, supervision and lecturing experience. Dr Mitrovic is an official Research Coordinator of the Western Cape e-Skills Knowledge production and Coordination CoLab (Ikamva National e-Skills Institute, South Africa) and a frequent UNDP Consultant for Open Government and Participation, UNDP Quality Assurance Reviewer (Knowledge Committee for the Products and Publications), Senior consultant at the Ikamva National e-Skills Institute (South Africa) and Senior consultant at the South African Provincial Government of the Western Cape.

Synopsis: The newest UN report on Sustainable Development (successor of the MDGs) points to the fact that modern ICTs are leading to an exponential increase in the volume and types of data available, hence creating unprecedented possibilities for informing and transforming societies and protecting the environment. Relevant literature suggests that opening government data could have huge potential benefits including transparency, efficiency and innovation. However, too many people, organisations and governments are excluded because of a lack of resources, knowledge, capacity or opportunity.

Who Should Attend?
The lecture could be useful to anybody interested in benefiting from open government data: government officials, academics, students, citizens, businesses or the civil society representatives.

Date: Thursday, 19 March 2015
Time: 18:00 – 20:00
Venue: Harold Pupkewitz Graduate School of Business, Floor 3, Room H
RSVP: Ms Cynthia Kauami
Meneger: Executive Education and Training
Tel: +264 61 207 2242
Email: ckauami@polytechnic.edu.na

www.polytechnic.edu.na

PUBLIC INVITATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED 5MW METDECCI KARIBIB SOLAR (PV) PLANT, KARIBIB

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Contact: Mr. C. AILONGA.
Tel: (+264-61) 224197, **E-Mail:** karibipv@matrixconsultingcc.com

DEADLINE FOR COMMENTS IS 06 APRIL 2015

Tweeting with NEPC on HIV/AIDS

Meriam Mavulu of Windhoek won herself two T-shirts and a thermal mug for being one of the people who actively participated in the discussions regarding HIV/AIDS on the digital platforms of New Era Publication Corporation (NEPC). NEPC, with the assistance of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) in Namibia, is using its digital platforms to engage the youth on crucial issues of HIV/AIDS. Check out the discussions on Twitter (@NewEraNewspaper), Facebook (New Era Newspaper) and on the website (http://www.newera.com.na) and stand a chance to win a prize. In the photo Conroy Feris, Head of IT at NEPC, presents the prize to Mavulu.

Photo: Tunomukwathi Asino

Kaapanda looks back at ICT sector development

By Staff Reporter

WINDHOEK – Minister of Information and Communication Technology, Joël Kaapanda, says the creation of the communication regulator, and its subsequent achievements, would be one of the things he would remember most from his time as Namibia's first ICT minister.

Kaapanda goes into retirement after the inauguration of Namibia's third president and new Cabinet on March 21. He said farewell to the industry's captains during a farewell dinner in Windhoek on Monday evening.

"For such a young authority, Communications Regulatory Authority of Namibia (CRAN) has achieved some milestones worth mentioning since its inception on 18 May 2011," said Kaapanda.

He went on to mention the regulation of mobile companies, saying without such intervention the market would have seen the emergence of one mobile company being too dominant and acting on its own without regulation.

Minister of Information and Communication Technology, Joël Kaapanda, speaks at his farewell dinner on Monday evening in Windhoek. Kaapanda goes into retirement after the inauguration of Namibia's third president and new Cabinet on March 21.

He also praised Namibia's mobile penetration, saying it is now at 100 percent. "Even old people can SMS," he says.

"I am sure each one of us has noticed a significant reduction in the price we pay for our phone calls over the past few years. I will have you know that CRAN was instrumental in successfully negotiating for a reduction in the termination rate between mobile operators from N$1.06 down to N$0.20," Kaapanda says.

"Not only did this reduction help you pay less for your phone call, it also goes further by assisting new entrants into the market to become more competitive since the rates reduce the cost operators pay to each other in order to carry calls," he says.

CRAN also developed the frequency-channelling plan to provide a regulatory framework in Namibia's migration from analogue to digital terrestrial television (DTT).

Kaapanda says Namibia's plan of migration from analogue to DTT has been so successful that a number of other SADC member states are using it as a benchmark as they too embark on their road to switch over to DTT.

During its short lifespan, CRAN has developed one of the best data collection systems in the SADC region. This system allows CRAN to accurately gather the required regulatory statistics from operators in order to evaluate the impact of regulatory decisions, to monitor the health of the sector and to comply with international reporting requirements.

In line with the statutory data collection requirements, CRAN is one of the best regulators in SADC and the whole of Africa which regularly publishes the annual 'Telecommunications Sector Performance Review' report. This report reviews the financial health and performance of operators, consumer price developments, challenges in the competitive landscape, and the general ICT trends of the year under review.

"No official spectrum band plan has been published for Namibia since 1978. CRAN recently developed an all-new spectrum band plan, which sets a basis for the regulatory framework for spectrum management, ensures harmonisation with the rest of the SADC region and adheres to the International Telecommunications Union (ITU) regulations," says Kaapanda.

5610 Notices

• Legal •

Prado Motor vehicle with registration number N101410W 1

TERMS: CASH to the highest bidder.

Dated at **WINDHOEK** this _____ day of **MARCH 2015.**

CRONJE & CO.
Attorneys for the Plaintiff
1 Charles Cathral Street
WINDHOEK
REF: JCC/tdk//GAT2/0003
TO: REGISTRAR OF COURT OF THE HIGH COURT
Main Division
Windhoek

clao150001377

IN THE HIGH COURT OF NAMIBIA CASE No. I 4301/2013

In the matter between:-

FIRST NATIONAL BANK OF NAMIBIA LIMITED
PLAINTIFF
and

AQUARIUS INVESTMENTS ONE HUNDRED AND THIRTEEN CC 2006/2383
FIRST DEFENDANT
PHILIP NAWA NDAKALAKO
SECOND DEFENDANT

NOTICE OF SALE IN EXECUTION OF IMMOVABLE PROPERTY

Pursuant to a Judgment of the above Honourable Court granted on **14 FEBRUARY 2014**, the following immovable property will be sold without reserve and voetstoots by the Deputy Sheriff of the District of SWAKOPMUND on **10 APRIL 2015** at **10:00** in the forenoon at Section No. 18,SEAGUL HAVEN, Swakopmund (Extension No. 9).

CERTAIN:
Section No. 18 as shown and more fully described on Sectional Plan No. 37/2008 in the building or buildings known as SEAGUL HAVEN, Swakopmund (Extension No. 9)

SITUATE:
In the Municipality of SWAKOPMUND
REGISTRATION DIVISION "G"

MEASURING:
189 (ONE EIGHT NINE) Square Metres

CONSISTING OF:
1 Lounge,
1 Dining room,
1 Kitchen,
3 Bedrooms,
2 Bathrooms,
2 W/C,
1 Garage

The "Conditions of Sale-in-Execution" will lie for inspection at the office of the Deputy Sheriff at SWAKOPMUND and at the Head Office of Plaintiff at WINDHOEK and Plaintiff's Attorneys, Fisher, Quarmby & Pfeifer, at the undermentioned address.

Dated at **WINDHOEK** this **18th** day of **FEBRUARY 2015**

5610 Notices

• Legal •

FISHER, QUARMBY & PFEIFER
LEGAL PRACTITIONER FOR PLAINTIFF
c/o Robert Mugabe & Thorer Street
Entrance on Burg Street
P O Box 37
WINDHOEK
GMcC/cq/ S 1692

clao140021153

5620 Notices

• Name Change •

THE ALIENS ACT, 1937
NOTICE OF INTENTION OF CHANGE OF SURNAME

I, (1)KAANDANGALA SYLVIA residing at **ONDANGWA**
and carrying on business/ employment as (2) **POLICE OFFICER**

intend applying to the Minister of Home Affairs for authority under section 9 of the Aliens Act, 1937, to assume the surname **HAUFIKU** for the reason that (3) **KAANDANGALA IS MY GRANDFATHER'S SURNAME, NOW I WANT TO USE MY FATHER'S SURNAME WHICH IS HAUFIKU**

I previously bore the name(s) (4) **KAANDANGALA SYLVIA**
I intend also applying for authority to change the surname of my wife and minor child(ren) (5) to **N/A**

Any person who objects to my/our assumption of the said surname of **HAUFIKU** should as soon as may be lodge his/her objection, in writing, with a staement of his/her reasons therefor, with the Magistrate of WINDHOEK
(Signed)
24.03.2015

clao150001435

6020 Obituaries

• Death & Funeral Notice •

RICHARD RICARDO SAMUEL "CARDO" LINKS
DOB: 20 January 1984
DOD: 21 March 2015
Funeral will be on the 4 April 2015 in Upington, SA
Psalm 23:4
"Even though I walk through the darkest valley, I will fear no evil, for You are with me; Your rod and Your staff, they comfort me."
Contact:
Patricia
081 638 7209
Mother
0027744390470,
Verazonia
0027727770095

PUBLIC INVITATION

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Tel: (+264-61) 224197, **E-Mail:** karibibpv@matrixconsultingcc.com

DEADLINE FOR COMMENTS IS 06 APRIL 2015

Shot in the arm for needy charities

By Regina Simasiku

WINDHOEK - The City of Windhoek (CoW) values the financial assistance being rendered by its social partners in the upliftment of those in need, the mayor has said.

Windhoek City Mayor Muesee Kazapua said the city cannot adequately deliver on its social responsibility thus it greatly values contributions made by the corporate, public and civil societies.

He made these remarks yesterday when he handed over food, bedding items and uniforms to various kindergartens in Windhoek.

Zanele Mbeki Primary and Day-Care Centre, the Katutura Central Kindergarten and Mamakhai Hangara were the beneficiaries of donations worth N$76 800 handed over by the mayor. Zanele Mbeki Primary and Day-Care Centre received a photocopier worth N$34 000 while the Katutura Central Kindergarten received playground equipment, blankets, pillows and mattresses all valued at N$15 500.

Mamakhai Hangara received paint, bedding and chairs worth N$13 300 and a child-headed household received beds, mattresses, school uniforms and foodstuffs worth N$14 000.

"Today's donations are results of a contractual obligation with Syntell Proprietary, a company that won the City tender on prepayment electricity vending," explained the mayor.

"The City of Windhoek is well aware of the role it has played in the upliftment of the livelihoods of our communities. It is in this spirit that council adopted a corporate social responsibility policy to guide us when rendering assistance and support to needy causes within our communities," said Kazapua. "We are mindful the goods that we are donating today, will not address all the needs of the beneficiaries but I am convinced it will improve the living conditions of the vulnerable children under their care. We are also aware there are many other needy groups that require our support," further stated Kazapua.

Kazapua appealed to all good citizens, in the public and corporate sectors to join the noble initiative aimed at enhancing the quality of life of all people.

"We applaud our government for establishing the Ministry of Poverty Eradication and Social Welfare as a deliberate national action to address the scourge of poverty among our people," he said.

Karen Hishidimbwa, a community activist, came across children living in a house by themselves. The children, aged between seven and 18 years, are school-going and need community support. Zanele Mbeki Primary and Day-Care Centre is the brainchild of Veronica Avula, a formerly disadvantaged mother and a widow, whose motivation stems from her continuous service to deprived children with no means of livelihood. The centre offers pre-school services to orphans and disadvantaged children from Katutura, Havana, Khomasdal and Wanaheda.

The day-care centre caters for 335 children.

The Katutura Central Kindergarten is a community kindergarten for disadvantaged children and orphans. It provides pre-school and day-care and it caters for over 45 vulnerable children. Mamakhai Hangara is a children's home that works towards the wellbeing of orphaned and vulnerable children by providing shelter and food.

The current drought has wreaked havoc among crop producers in all regions in the country, as this picture taken recently in the Oshikoto Region demonstrates. Photo: Deon Schlechter

Namibia to host drought conference

By Deon Schlechter

WINDHOEK – Namibia will host another first for the country when it facilitates the Ministry of Environment and Tourism's African Drought Conference under the theme: "Enhancing resilience to drought events on the African continent" at a local hotel from May 11 to 15, 2015.

Africa is highly vulnerable to drought events with about a third of the population living in drought-prone areas and 97 percent of agriculture being rain-fed.

Drought has devastating economic, environment and social impacts in terms of loss of human life, food insecurity, reduced agricultural productivity, and degradation of natural resources. Namibia is the driest country south of the Sahara and is currently suffering the effects of another drought.

The majority of African countries continue to be inadequately prepared to cope with droughts, which are set to become more frequent with climate change.

Only a few countries in the world have fully-fledged drought management policies, while interventions in most countries tend to focus on reacting after the event rather than mitigating the impacts of drought through enhancing preparedness over the long term.

In line with its role as UNCCD COP11 president, the Ministry of Environment and Tourism is organising this conference as a follow up to the outcomes of the high-level meeting on national drought policies (HMNDP) held in Geneva in 2013, and will focus on identifying the specific needs of African countries in the area of effective drought mitigation, with a view to developing a strategic framework for enhancing resilience to drought events on the African continent.

The overall objective of the conference would be to develop an overarching strategic framework for Africa to enhance its resilience to the impact of drought events. The specific objectives of the conference would be to:

- Focus regional and international attention on the issue of drought mitigation;
- Identify needs and shortcomings as well as good practices in the area of drought mitigation;
- Move towards a framework for enhance resilience to drought impacts on the African continent; and
- Strengthen partnerships and cooperation for enhanced drought resilience.

Conference Approach

The conference would comprise a three-day meeting of technical experts followed by a one-and-a-half-day high-level segment, involving responsible African ministers and other high-level stakeholders.

Conference Participants

The main participants would be:

- UNCCD national focal points and responsible ministers from each African country;
- Regional and Pan-African organisations;
- Representatives from Namibian institutions responsible for drought management;
- UN agencies and development partners;
- Research institutions and academics;
- Civil society and community-based organisations;
- Private sector

Outcomes from the Conference

The conference would set in motion the process to develop a strategic framework for enhancing resilience to drought at continental level that would contribute to poverty alleviation, economic development and enhance environmental and human well-being. The work of the conference would be guided by an agenda for action white paper document, which would be circulated ahead of the conference.

With this in mind, the outcomes of the conference would be brought to the attention of the African Union for possible endorsement by African heads of state and government. Namibia, as president of the COP11 bureau, would transmit a report on the outcomes of the conference to the COP 12 to galvanise additional support from the parties.

Don't be a dummy

INVITATION TO TENDER

LIBRARY MANAGEMENT SERVICES

The National Road Safety Council (NRSC) is a statutory body established in terms of section 2 of the National Road Safety Act, Act 9 of 1972 to promote road safety in the Republic of Namibia with the view of reducing collisions and their resultant human mutilation and trauma and to carry out road safety research that will effect road safety campaigns and policy.

TENDER DESCRIPTION
The NRSC invites individual and institutions to submit proposals for cataloguing and classifying informative, legislative and policy related reading material as well as developing of library information management systems.

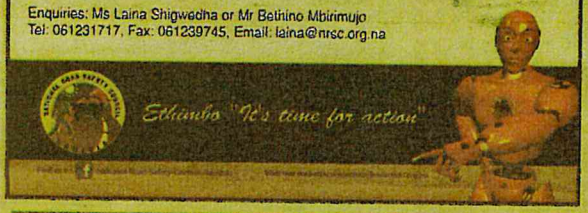
REQUIREMENTS
Bachelor Degree in Library and Information Science at NQF Level 7 and five years working experience in a library or archive setting.

TENDER DOCUMENTS
Terms of reference are obtainable from the offices of the National Road Safety Council.

CLOSING DATE FOR SUBMISSIONS OF PROPOSALS
20 April 2015 at 17:00. No late submissions will be accepted after this date and time.

The envelopes should be clearly marked Library Management Services and sealed. Sealed envelopes must be deposited in the NRSC Tender box at the NRSC offices, corner of Harold Pupkewitz and Independence Avenue and addressed to the Executive Secretary.

Enquiries: Ms Laina Shigwedha or Mr Betrino Mbirimujo
Tel: 061231717, Fax: 061239745, Email: laina@nrsc.org.na



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Contact: Mr. C. AILONGA,
Tel: (+264-61) 224197, E-Mail: karibibpv@matrixconsultingcc.com

DEADLINE FOR COMMENTS IS 06 APRIL 2015

NAMFISA
NAMIBIA FINANCIAL INSTITUTIONS SUPERVISORY AUTHORITY

Tender

1.1 The Namibia Financial Institutions Supervisory Authority invites tenders from interested consultancies for its ORGANISATIONAL TRANSFORMATION/CULTURE CHANGE

1.2 The Tender documents be forwarded to:

Ms. Johanta Vermaak
Contracts Manager
NAMFISA
PO Box 21250
Windhoek
4th floor, 154 Independence Avenue
Sanlam Centre

1.3 The deadline for submission of the above proposals is on or before 24 April 2015 at 12:00.

1.4 Complete terms of reference can be obtained on request from Ms. Johanta Vermaak, Contracts Manager, on +264612905241 and/or jvermaak@namfisa.com.na.

NAMIBIA TRAINING AUTHORITY

OKAKARARA VOCATIONAL TRAINING CENTRE

Private Bag 2112, Tel: +264 67 317069,
Fax: +264 67 317469
Email: ovtc@okakarara.vtc.org.na

ALL TRAINEES THAT ARE DUE FOR RETRAINING MUST REPORT TO THE CENTRE AND ARRANGE WITH THEIR TRAINERS ON THE DATES FOR RETRAINING. AN AMOUNT OF N$450 MUST BE PAID FOR RE-ASSESSMENT AND AN AMOUNT OF N$100.00 FOR THEORATICAL AND N$250.00 FOR PRACTICALS MUST BE PAID FOR RE-TRAINING.

THE CLOSING DATE FOR REGISTRATION IS 08 APRIL 2015

APPENDIX E

Minutes of Public Participation Meeting held in

USAB COMMUNITY HALL, KARIBIB

30 March 2015

Karibib 5MW Solar PV Plant, Karibib, Namibia
Minutes of Meeting

Venue: USAB COMMUNITY HALL
Date: 27th March 2015

Time: 17:15

1. Introduction and Welcoming

Mr. Ailonga from Matrix Consulting Services (MCS) opened the meeting and welcomed all the stakeholders. The purpose of the meeting was highlighted and participants were encouraged to comment on the proposed development in order to improve the project relevance to stakeholders' needs and expectations. Participants were asked to complete the attendance register.

2. Overview of the Meeting

Chris Ailonga from MCS gave an overview of the proposed development. He emphasised the need for proactive participation during the meeting as it was the right platform to provide information, recommendation and to receive feedback from the project developers and consultants.

Key aspects during the introductory remarks:

- Meetings agenda
- Meetings rules
- Described the project's team and its roles and responsibilities
- Summarised the project activities
- Explained the project progress
- Explained the impacts expected

The participants were given the opportunity to comment on the agenda and to ask clarification questions.

3. Project Overview

Mr. Ailonga from MCS gave a presentation on the project. The presentation highlighted the following:

- Background on the project and the key project implementers
- Overview of the project programme
- Overview of the technical details of the project.
- Potential impacts

Find the attached presentation in Appendix I

5. Conclusion

The proposed development of Solar PV Plant does not pose serious long-term negative environmental impacts. Most of the identified impacts could be mitigated through good environmental management practice.

6. Meeting Closure

Mr. Ailonga thanked the participants for attending the meeting, and for being conversant during the meeting. The attendance list is attached at the back of this document.

Interested parties were invited to send any comments relating to the proposed project via letters or email:

Chris Ailonga
Matrix Consulting Services
P O Box 25824, Windhoek, or via
ppp@matrixconsultingcc.com

Stakeholders Consultation List: Public Meeting

Environmental Impact Assessment:
Metdecci Karibib 5MW solar (PV) plant and its associated 900M transmission line (11KV) from the plant to the Nampower distribution station,
Karibib, Erongo Region

30 March 2015

Participant Name	Organization/ Affiliation	Contact No:	Suburb	E-mail
David Amutenya	MCS - Geoscientist.	0812355985	Windhoek	amutenyad@gmail.com
Sake Shapiku	MCS - Hydrologist	061-224197	Windhoek	spike@mcsconsulting.cc.com
Barnabas Uugwanga	Metdecci Energy/Nam	081 3226938	Windhoek	barnabas@lithon.com
David Tjipinge	Karibib TC	0811226839	Karibib	davidtjipinge94@gmail.com
Pavel Patočný	Metdecci, ...	... 999	Vapneč	patocny.p@decci.cz
Leonard T. Iyambo	Metdecci Energy	0811272755	Grootfontein	iyambo...@gmail.com
Darina Lukavska	Metdecci Energy	+420777999...	Prague, CZ	lukavska.d@decci.cz
Jonathan Mathew	Metdecci energy	+27828896...	JHB	jonathan@metgzy.cc.za

Participant Name	Organization/ Affiliation	Contact No:	Suburb	E-mail
D. Kapuka	KTC	0812989632	Katutura	
Simeon Shetumana	Brick layer	0814653992	Karibib	
S				
CHRIS ALONGA	MCS	0811245890	WHK	cailonga@gmail.com

Participant Name	Organization/ Affiliation	Contact No:	Suburb	E-mail

Participant Name	Organization/ Affiliation	Contact No:	Suburb	E-mail

Participant Name	Organization/ Affiliation	Contact No:	Suburb	E-mail

Participant Name	Organization/Affiliation	Contact No:	Suburb	E-mail

APPENDIX F

MetDecci

Solar Power

Introduction

The MetGroup of companies has partnered up with a Czech born company Decci to form **MetDecci Pty (Ltd).** Decci owns and operates PV power plants under the trademark of FVE CZECH. This trademark represents a complex technological PV power plant design, operational regulations, and control systems for PV power plant operations. Decci has developed one of the largest stand-alone power plants in the Czech Republic. In 2010 this 35 MW photovoltaic power plant was the ninth largest PV plant in the world.

MetGroup's "one stop shop" solution for infrastructure development together with Decci's track record of world class turnkey PV power plant solutions represent the right combination of knowledge and expertise in construction and solar energy. MetGroup via its subsidiary company MetBCE handles construction, civil work and infrastructure, Decci is in charge of project preparation including technical design and the most suitable technical solution. MetDecci is a team that can offer and deliver world class turnkey PV power plants and become your solar specialist in the South African and African market.

While planning the construction of PV power plant MetDecci pays great attention to the surrounding environment, considers investor's interest and, if required, adjusts design and technical solution of the PV power plant in this regard:

- **Framing system for panels** – MetDecci is able to come up with an optimal design of the PV power plant regardless the type of framing structure (firm framing system, trackers or combination of both) including the load capacity calculation in respect of footwall.
- **PV panels** – MetDecci has a tight and strong relationship with its supplier of photovoltaic panels. An integral part of the MetDecci's business activities are regular off and on site inspections and technical controls of the PV panels' manufacturing process. Manufactured and delivered PV panels must be suitable for the solar irradiation levels in given area as well as meet other requirements.
- **Inverters and transformers –** Selected types of inverters and transformers must always enable smooth conversion of electrical energy generated by the PV panels and its transport to grid.

MetDecci cooperates with a number of business partners, manufacturers, and suppliers of services, with whom we maintain long term relations. Depending on which country we attend to do business, we will ensure that we meet the government legislation policies, and utilize as much local labour and products without diverting from our high level of quality.

MetDecci PVP Construction

The preparation phase includes the phase of induced investments, meaning investments necessary to be performed into the construction site and its surrounding area before construction of the PVP can begin:

- Paving access roads, building storage and parking lots
- Fencing the land –future construction site
- Construction of the connecting point (switch off device keeping the same voltage level – high voltage) or substation including transformers

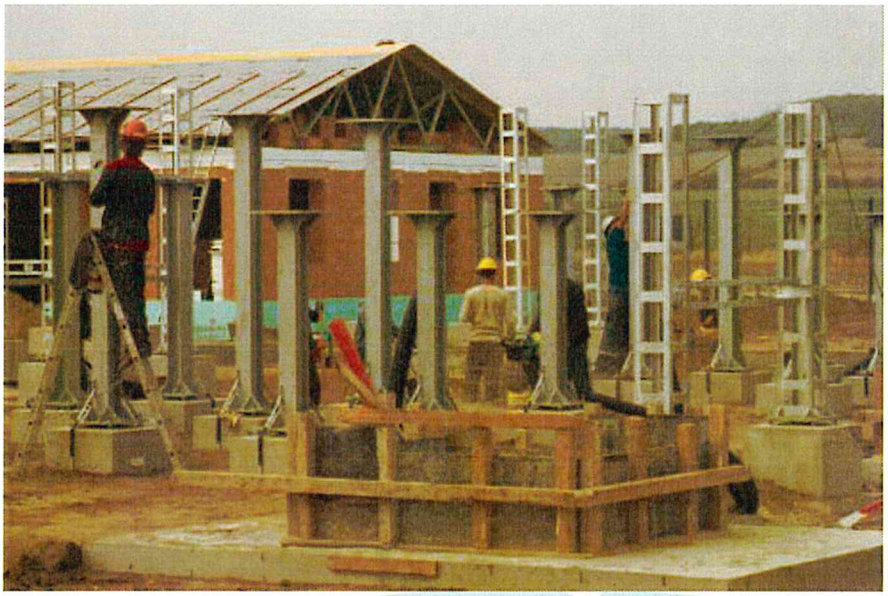
Fenced construction side for PVP

Phase 1 - preparation

Trenching and Cabling

Phase 1 - preparation

Construction of substation including transformers to change voltage levels



Phase 1 – preparation

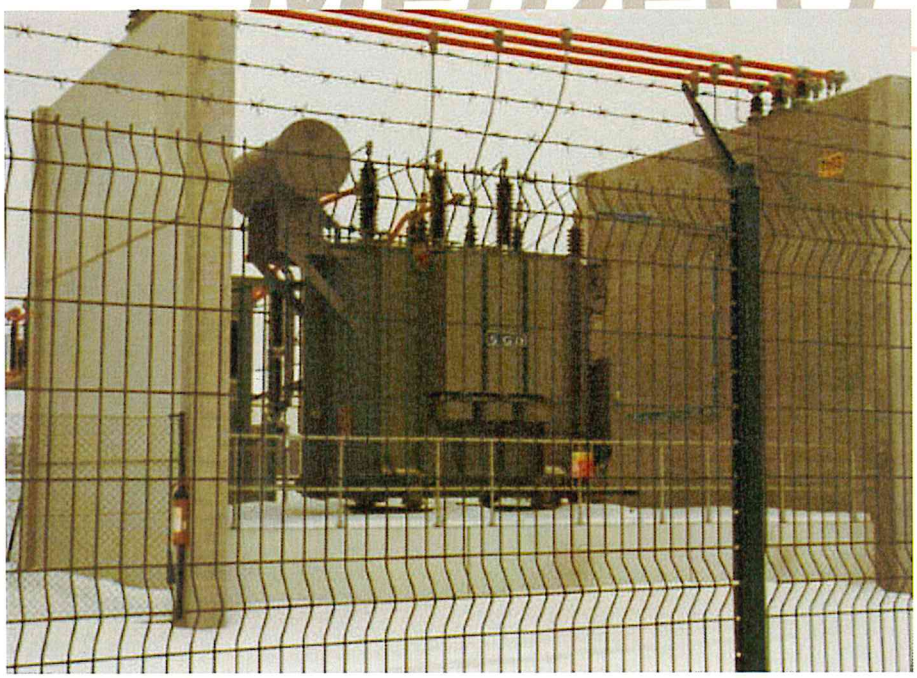
Construction of substations including transformers

Phase 1 – preparation

Substation including transformers interior

Phase 1 – preparation

Substation 35MW (22-110kV)



Phase 1 – preparation

Fencing

Phase 1 – preparation

Preparatory works on the land / construction side

Phase 1 – preparation

Construction of paved areas on roads

Phase 1 – preparation

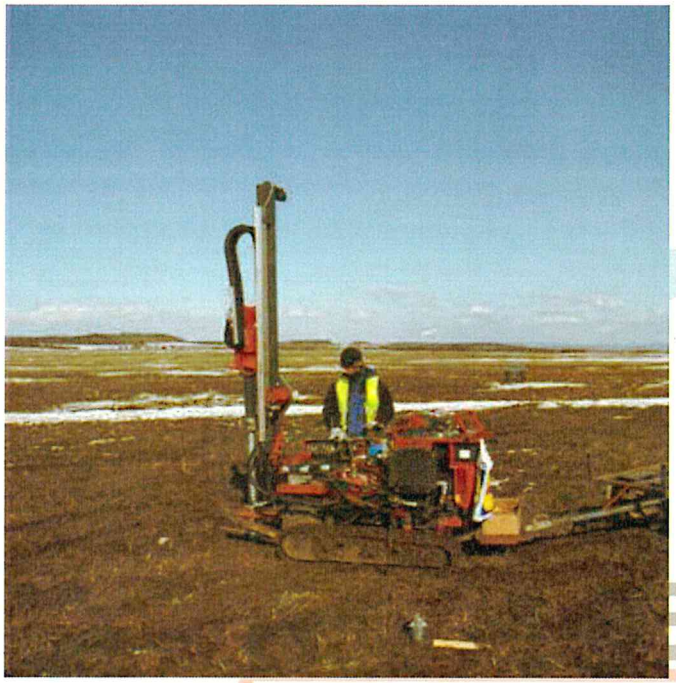
Construction of storage plots

Phase 1 - Preparation

Construction of PVP

- Preparatory works around the construction site as well as the administrative process (obtained construction permit, agreement on connection to grid), the construction of the PVP begins.
- Construction is managed based on a schedule which is binding for all the supplies and technical parts is verified.

Ground screws are being placed for structural strength



Construction of PVP

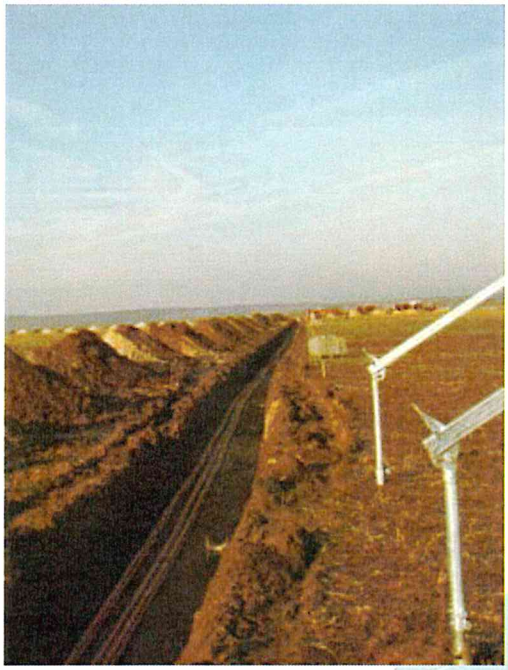
Geotechnic measurements to mark spots for erection of construction frameworks

Construction of PVP

Construction of PVP

Erection of trackers (2)

Laying cable in trench



Construction of PVP

Taking over supplies

Construction of PVP

Installation of cable protections

Construction of PVP

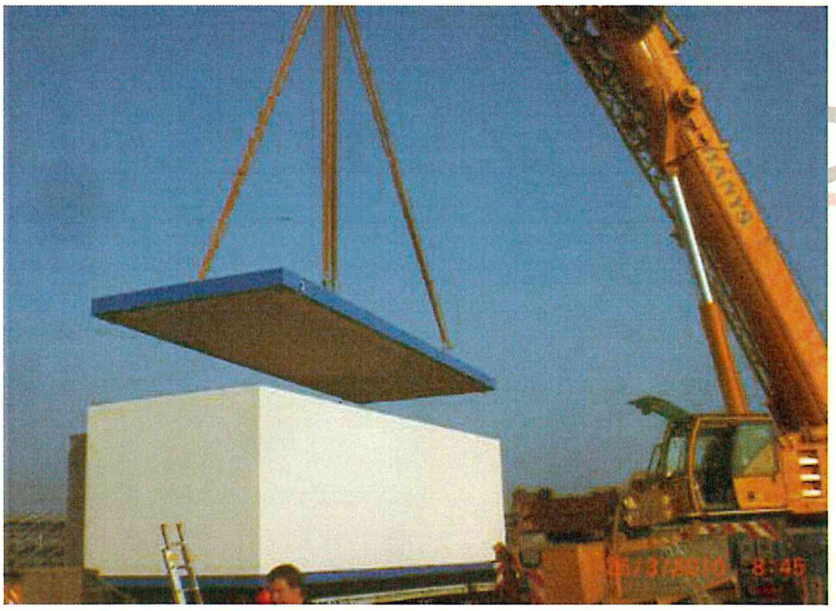
Placement of transformer stations transformation up to 22kV

Construction of PVP

PVP under construction

Construction of PVP

Closing the top cover of a transformer station

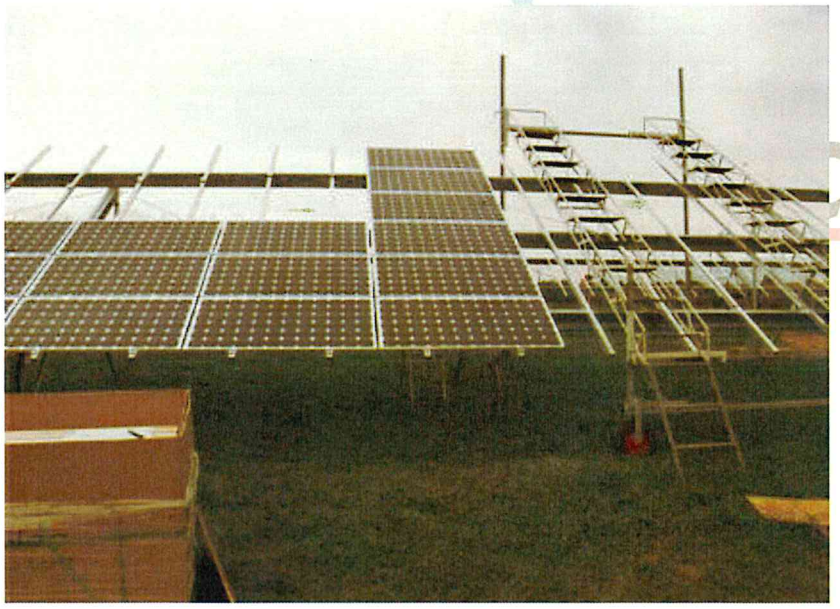


Construction of PVP

Inspection of panels before their installation – for any visible damage or cracks

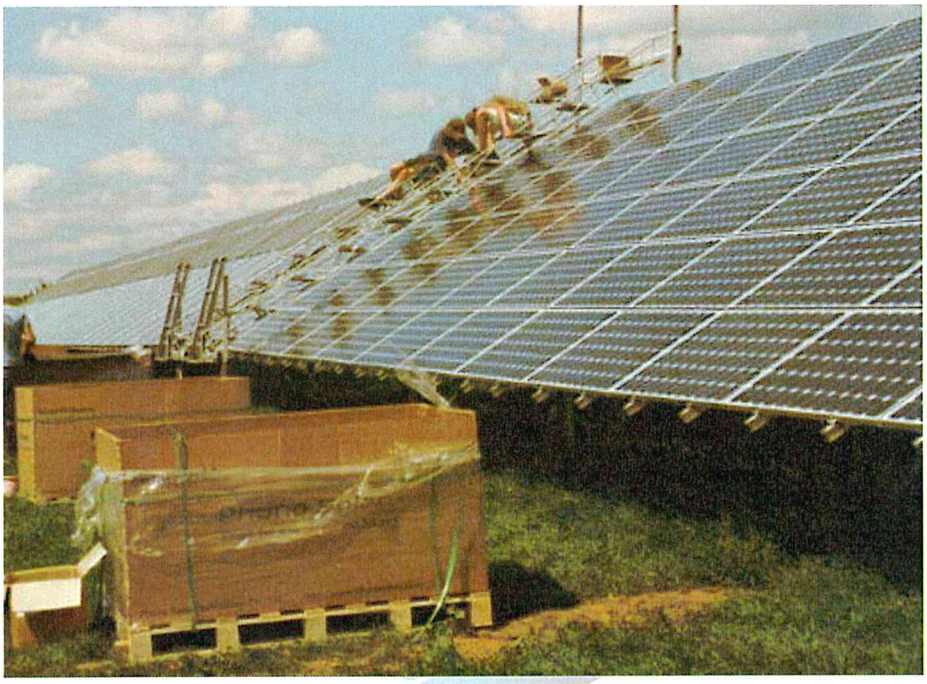
Construction of PVP

Installation of panels



Construction of PVP

Installation of panels



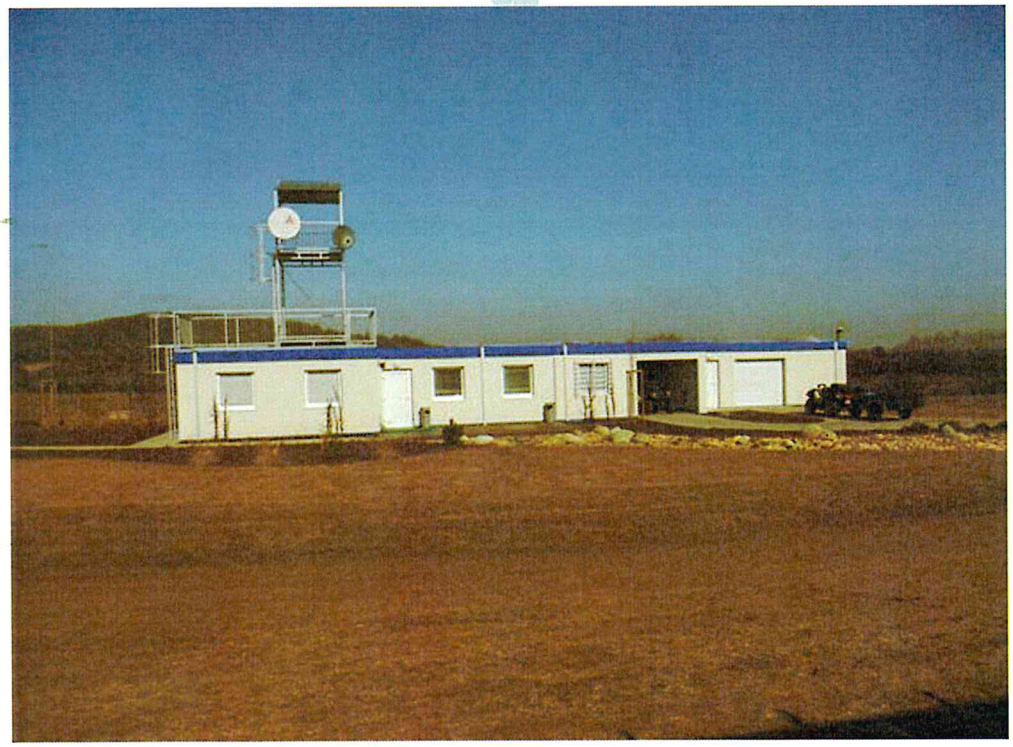
Construction of PVP

Setting up control and operational center

Construction of PVP

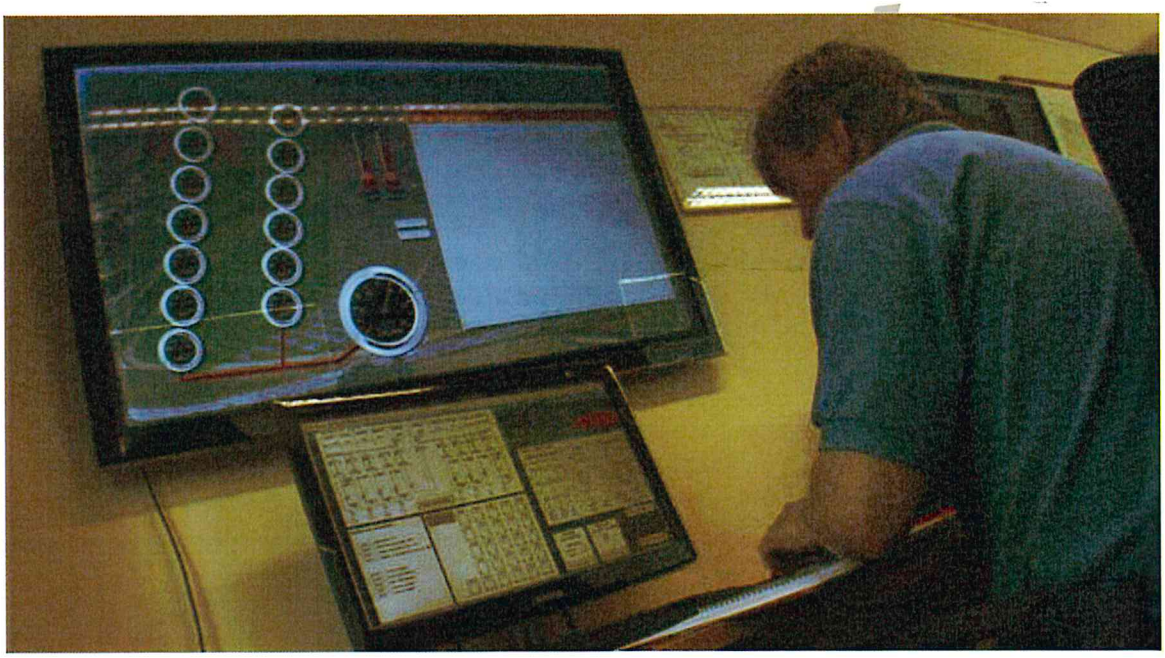
Parking lot and garden located in the PVP

Fully set up and operational control center

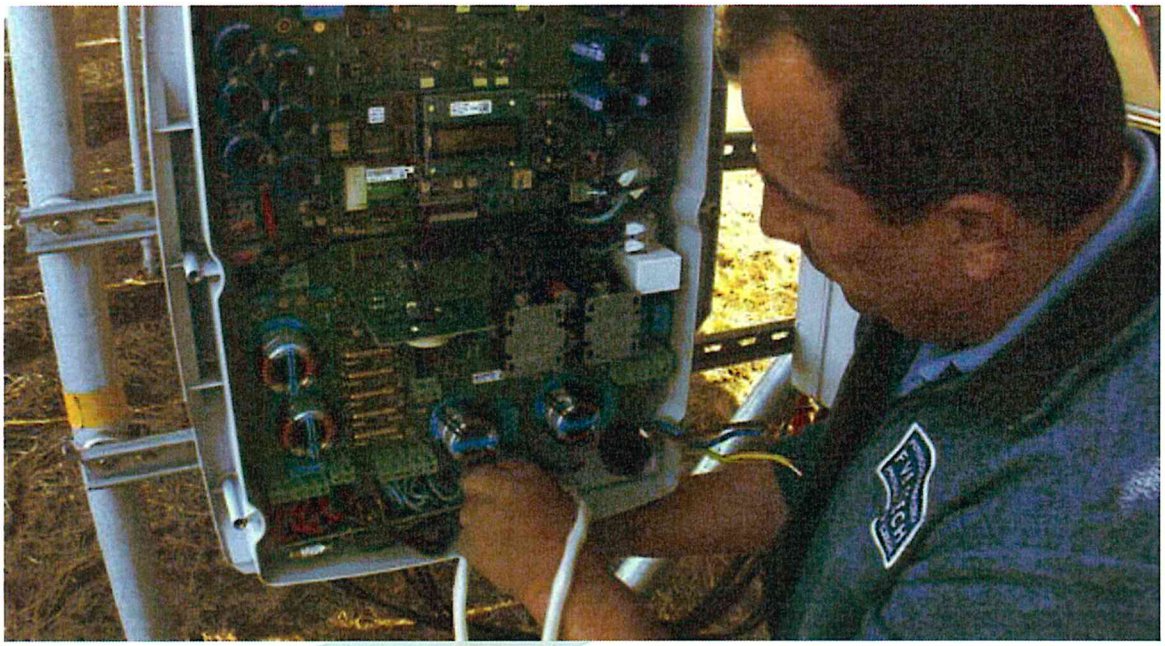


Control center after having finished all works

Working space of the operating crew



Adjustment of inverters

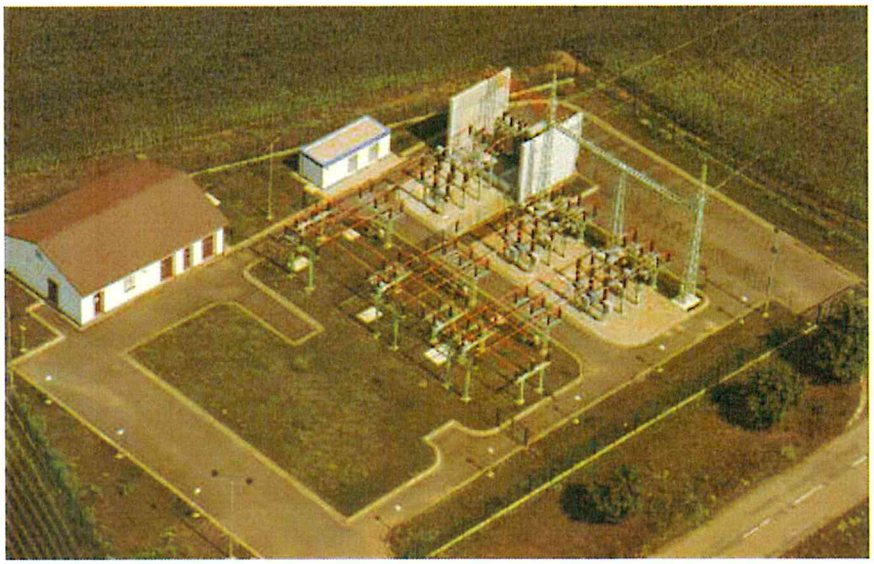


Decentralized inverters

PVP after construction works

- After finishing the construction and trial operation the PVP is put into full operation.
- Services company and its maintenance crew handles day-to-day operation and maintenance.

Substation including transformers to change voltage levels



Accomplished PVP

One year after the completed construction of PVP control center and surrounding garden plot

Accomplished PVP

One year after the completed construction of PVP

Accomplished PVP

PVP at sunset

Below is the full detailed Gantt chart of the construction project

APPENDIX G

Chris Ailonga

From: Grace berasius [emginvestmentscc2014@gmail.com]
Sent: Friday, March 20, 2015 6:15 PM
To: karibibpv@matrixconsultingcc.com
Subject: Public Invitation
Attachments: Presentaion of EMG.pdf

Good day Sir

My name is Ms Grasiana Berasius from Emg Investments CC, we are registered solar suppliers and installer with the Ministry of mones and Energy.

My reason to write this mail to you, we saw thr Public Invitation on the Namibian Newspaper of March 18th. We are instrest to voluntary work with whatever company that will win the bid. Our main reason is to increase our knowledge on installing power Pv Plant, we are a company that is full of youth and I myself I am a youth of 27 years old but we are all eager to learn from this since we don't have yet institutions that offer this type of training yet in Namibia. We have attached our company profile.

We hope to hear from you soon.
Many thanks

--

Ms Grasiana Florinda Berasius
Managing Director
Po Box 878 Oshakati
Oshikango, opposite Oshikango Garage
Tel: 00264 65264949
Cell:00264 813672755
Fax:00264 65264906

10. Registration and Comments

Please fill in particulars and return completed document to be registered as an Interested & Affected Parties (I&AP) to:

Participant Name: SONJA LOOTS	**Organization/Affiliations:** NATIONAL BOTANICAL RESEARCH INSTITUTE
Position: MANAGER: THREATENED PLANTS PROGRAMME	**Telephone:** 061 202 2020
Fax:	**E-Mail:** sonjal@nbri.org.na

Postal Address: P/bag 13184

Comments/Suggestions and Questions: I would suggest that you request a species list for the quarter degree square (QDS) in which the area falls that you want to develop. I think it must be 2115DD Then you can see what species of conservation concern you should expect in the area where the impact will take place and you can look out for them. Contact Esmeralda Klaassen essies@nbri.org.na for an information request form Or contact me, I can also forward the form to you.

Tel: +264 61 224197
Fax: +264 61 212165
E-Mail: karibibpv@matrixconsultingcc.com

Contact Person:	Mr. C. Ailonga
Position:	EIA Project Manager

Chris Ailonga

From: Chris Ailonga [chris@matrixconsultingcc.com]
Sent: Thursday, April 09, 2015 8:24 AM
To: 'sonjal@nbri.org.na'
Cc: 'Spike Shippiki'
Subject: RE: Proposed solar plant - Karibib

Good Day Sonja,

Thank you for your contribution towards our project,

Can you please send us the species list as indicated in your comments sheet 2115DD.

Highly appreciated.

However I should note that the proposed site is previously disturbed, it was bush cleared for previous farming purposes before,

The other important note is that vegetation will not be cleared for this project, as the proposed area is dominated by grass and short shrubs (less than 25cm) which does affect the panels efficiency at all, The panels will be pegged in the ground without concrete foundations (easily removable) . The vegetation will be intact, with the responsibility of trimming (not clearing) higher vegetation growing towards panels being on the developer. The vegetation will remain intact.

Kind regards,

Chris Ailonga (MSc Env Sci , Wits)
Environmental Specialist (M.D.)
Tel : +264 61 224197
Cell: +264 811245840
Fax: +264 61 212165
E-mail: chris@matrixconsultingcc.com
SKYPE: chris.ailonga
69 Burg Street, Luxury Hill, Windhoek
P.O.Box 25824, Windhoek, Namibia, 9000

-----Original Message-----
From: sonjal@nbri.org.na [mailto:sonjal@nbri.org.na]
Sent: Thursday, April 02, 2015 12:13 PM
To: karibibpv@matrixconsultingcc.com
Subject: Proposed solar plant - Karibib

Dear Mr. Ailonga,
Please find attached my comments on the BID for the EIA for the proposed solar plant in Karibib.

I hope you will find this in order. Please contact me if you have any questions.

Regards,
Sonja Loots,
National Botanical Research Institute

Tracking:

Recipient	Read
'sonjal@nbri.org.na'	
'Spike Shippiki'	Read: 4/9/2015 9:05 AM

Chris Ailonga

From: Frank Lohnert [flohnert@iway.na]
Sent: Monday, April 13, 2015 9:50 PM
To: 'Chris Ailonga'
Subject: RE: Registration of NBG as I&AP for EIA: METDECCI Karibib Solar PV plant
Attachments: image001.jpg

Noted, thank you Chris !

Please keep Namib Botanical Gardens in mind, should there be any relations needed.

I look forward to the Scoping report indicating the affected botany.

Thanks, regards,

Frank Löhnert
Namib Botanical Gardens CC
☎/🖷 +264 (0) 64 – 400304
+264 (0) 81 – 129 4770
✉ P.O.Box 4494, Vineta, Swakopmund, NAMIBIA
flohnert@iway.na

From: Chris Ailonga [mailto:chris@matrixconsultingcc.com]
Sent: 09 April 2015 08:16 AM
To: 'Frank Lohnert'
Cc: 'Spike Shippiki'
Subject: RE: Registration of NBG as I&AP for EIA: METDECCI Karibib Solar PV plant

Good Day Frank,

Attached please find the BID,

Thank you for the interest in this project.

However I should note that the proposed site is previously disturbed, it was bush cleared for previous farming purposes before,

The other important note is that vegetation will not be cleared for this project, as the proposed area is dominated by grass and short shrubs (less than 25cm) which does affect the panels efficiency at all, The panels will be pegged in the ground without concrete foundations (easily removable) . The vegetation will be intact, with the responsibility of trimming (not clearing) higher vegetation growing towards panels being on the developer. The vegetation will remain intact. Please feel free to contact me,

However , if there is a need to harvest/relocate plants, feel free to contact me.

Thank you for making decisions with us.

From: Frank Lohnert [mailto:flohnert@iway.na]
Sent: Wednesday, April 08, 2015 11:55 PM
To: karibibpv@matrixconsultingcc.com
Subject: Registration of NBG as I&AP for EIA: METDECCI Karibib Solar PV plant

Dear Mr Ailonga,

Following the invitation through the media, **please register the Namib Botanical Garden project** and myself, Frank Lohnert, as I&APs.

Please forward a copy of the BID for above project.

Hereunder a summary of the I&AP and pertinent concerns:

DATE / STATUS	**2015.04.04**
NAME	**Namib Botanical Gardens, represented by Frank Lohnert**
POSTAL ADDRESS	**P.O. Box 4494, Vineta, Swakopmund**
TEL / FAX No.	**064 – 400 304**
CELL PHONE No.	**081 – 129 4770**
E-MAIL ADDRESS	**flohnert@iway.na**

I&AP's INTEREST IN THE PROPOSED PROJECT

The motivation and objectives of the Namib Botanical Garden (NBG) project are included in the attached fact sheet. In short:

Objectives of the Namib Botanical Garden

- To develop a botanical garden (on its site approx. 10 Km outside Swakopmund);
- To preserve and publicly display indigenous plant species of the Namib desert;
- To create "xeri-scapes" (dry-gardens) and other themed horticultural exhibits;
- To propagate Namib desert & other indigenous species, for display and sale to the public;

We would thus be interested to source indigenous, protected plant material requiring relocation from your EIA site, for purpose of relocation to and display of such plants within the NBG project, and as for stock for propagation.

COMMENTS / QUESTIONS:

Please register Namib Botanical Gardens project as I&AP.

Please register NBG as a prospective partner and destination site in the relocation of relevant flora from sites to be cleared of vegetation.

We have recently participated in a number of plant relocation exercises at Husab mine near Swakopmund. We would be willing to physically assist in relocations.

Thanks, kind regards,

Frank Löhnert
Namib Botanical Gardens CC
☎/🖷 +264 (0) 64 – 400304

+264 (0) 81 – 129 4770
P.O.Box 4494, Vineta, Swakopmund, NAMIBIA
flohnert@iway.na

This email has been checked for viruses by Avast antivirus software.
www.avast.com

APPENDIX H

KARIBIB TOWN COUNCIL
TEL: (+264 64) 550016
FAX: (+264 64) 550032
P. O BOX 19 KALK STREET
KARIBIB. NAMIBIA

Enq: Office of the Chief Executive

27 Nov. 14

Vigor Investments cc
P.O.BOX 20907
Windhoek
E-mail: barnabas@lithon.com

Dear Mr. B. Uugwanga

RE: APPLICATION FOR LAND (SOLAR PV ELECTRICITY GENERATION PLANT).

Karibib Town Council as per **Council Resolution No: CM 0214/19/11/2014** approved your application to establish a Solar PV Electricity Generation Plant.

The Council has approved 15 **hectares** of land and accepted the offer that your Company has put forward as stipulated in your letter.

We are looking forward to work together and bring about much needed developmental initiatives in Karibib Town.

Yours Truly,

pp

Lesley Grand Goreseb
Chief Executive Officer

Karibib Town Council
PO Box 19, Karibib
2014 -11- 26
Tel: 064 - 550016
Fax: 064 - 550032
Office of the Chief Executive Officer

All official correspondence must be addressed to the Chief Executive Officer

Appendix I

PROPOSED 5MW SOLAR (PV) METDECCI KARIBIB PLANT PROJECT

KARIBIB

PUBLIC PARTICIPATION MEETING

30 MAR 2015

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

AGENDA

- Rules of the meeting
- Welcome & introduction
- Why the project?
- Where?
- Background of the development
- Potential impacts
- Additional issues & discussions
- Conclusion

RULES OF THE MEETING

- Complete the attendance list before you leave, incl. e-mail address.
- Duration of meeting – 1 hour, if you need to leave earlier, please leave us with your inputs.
- Please identify yourself and your affiliation before posing a question.
- All cell phones switched off/on silent.

WELCOME AND INTRODUCTION

Purpose of meeting

- To provide more information regarding the development
- Identification of public's interest and values
- Identification of priorities for assessment
- Encouraging public understanding of the proposed project

THE PROJECT TEAM

- Chris Ailonga – EIA Project Manager
- Mize Shippiki - Environmental Practitioner/ Project Hydrogeologist,
- David Amutenya – Geoscientist
- Barnabas Uugwanga – MetDecci Energy Investment (Pty) Ltd Project Director.

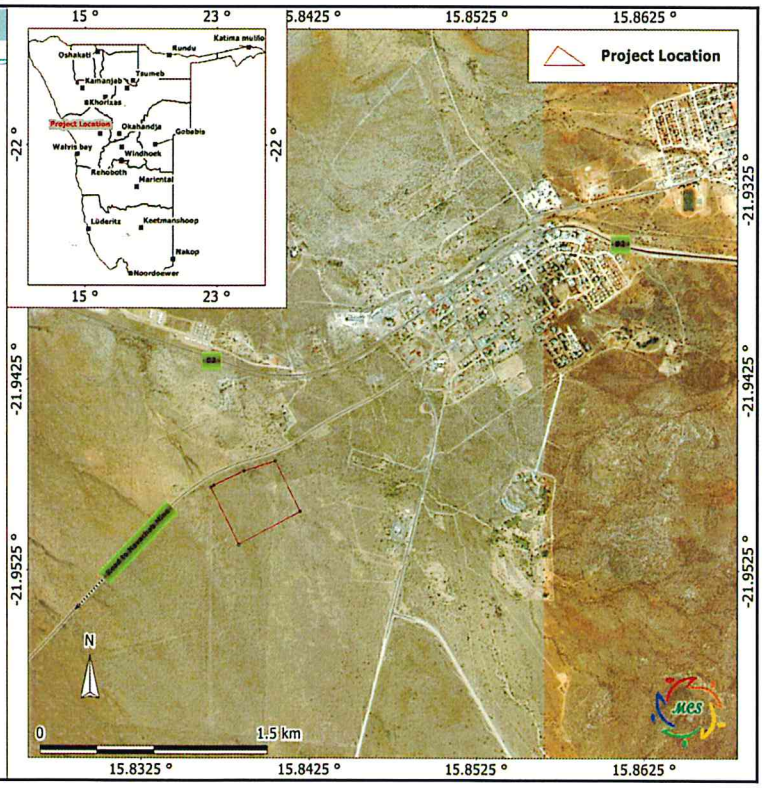
WHY THE PROJECT?

- Due to power shortage in Namibia.
- Growing economy, more industries and mining operations are expected to be established soon.
- To have a sustainable supply of power in Namibia.

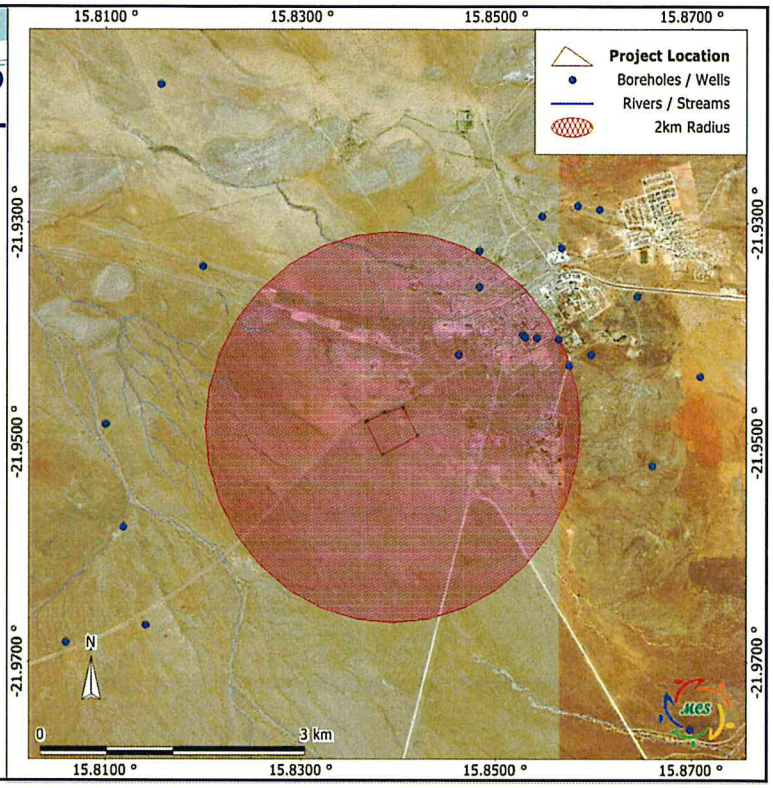
PROPOSED CYCLE

- **Project identification and design**
- **Environmental Impact assessment**
- **Implementation – Construction of the PV Plant**
- **Operational phase - power generation and transmission.**

WHERE?



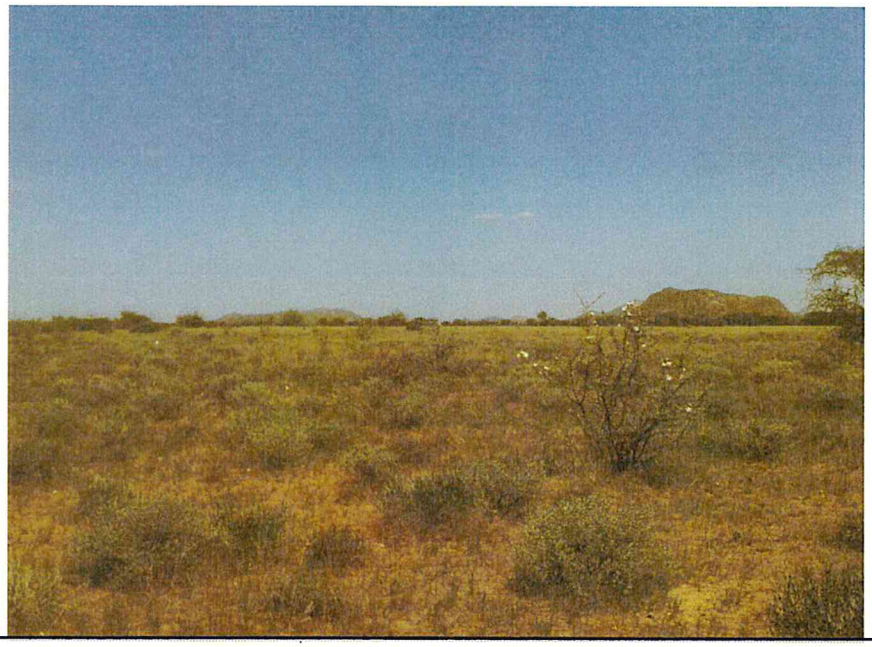
WHERE?



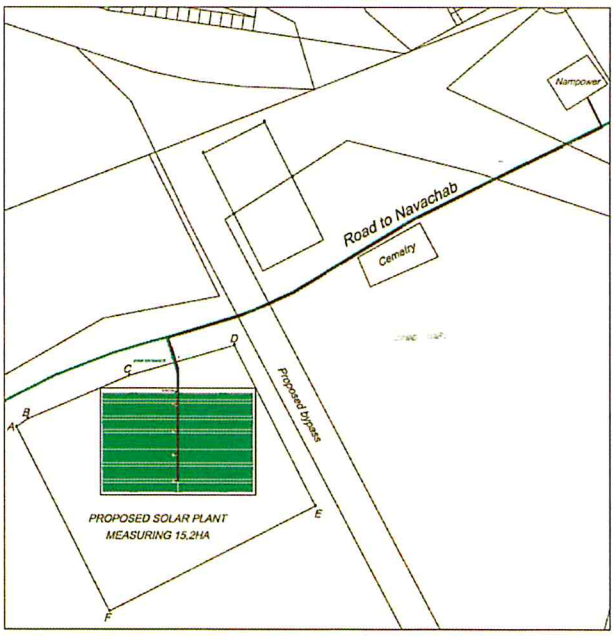
BACKGROUND

- **METDECCI ENERGY INVESTMENT (PTY) –LTD**
- **15 Ha Plot, the actual plant will only cover 6Ha.**
- **5MW, PV Plant**
- **Approximately 900m transmission line (underground)**
- **Connecting to the Karibib Nampower Substation.**
- **Karibib Municipality– agreement in place.**

SITE



SITE


Nampower
Road to Navachab
Cemetry
Proposed bypass
A
B
C
D
E
F
PROPOSED SOLAR PLANT
MEASURING 15,2HA

CONSTRUCTION PHASE

- Transporting relevant building material and equipment.
- Installation of solar panels and transmission line.
- Land clearance (trimming of shrubs)
- Installation of warning signs

CONSTRUCTION PHASE

Aspect	Impact Type	Significance After Mitigations
Dust	NEG	LOW
Noise	NEG	LOW
Safety and security	NEG	LOW
Traffic	NEG	LOW
Nuisance	NEG	LOW
Soil Erosion	NEG	LOW
Groundwater contamination	NEG	LOW
Surface water contamination	NEG	LOW
Waste generation	NEG	LOW
Cumulative impacts	NEG	LOW
Heritage impacts	NEG	LOW
Ecological impacts	NEG	LOW

OPERATIONAL PHASE

- Operation and maintenance of the METDECCI Karibib Solar Plant (PV), and associated activities

OPERATIONAL PHASE

Aspect	Impact Type	After Mitigations
Spillage	NEG	LOW
Fire and explosion hazard	NEG	LOW
Surface water	NEG	LOW
Groundwater	NEG	LOW
Noise	NEG	LOW
Air quality	NEG	LOW
Health and safety	NEG / POS	LOW
Traffic	NEG	LOW
Generation of waste	NEG	LOW
Cumulative impacts	NEG	LOW
Ecological impacts	NEG	LOW

SOCIO-ECONOMIC ISSUES

Identified Impact	Impact Type
Employment	POS
Property values	POS
Skills transfer & Technology transfer	POS
Stimulation of economic development	POS
Serviced land scarcity in Karibib	NEG
Increased spread of HIV/ AIDS	NEG
In-migration to Karibib	NEG
Increased informal settlement and associated problems	NEG

OTHER POTENTIAL BENEFITS

- Ensure power supply in Namibia, and specifically in Erongo Region
- Improve economic activities in Karibib
- Potential revenue generation from the sale of power
- It is estimated that the new jobs created will improve the livelihoods of the workers and their families. (± 50 direct potential jobs in the construction phase , less than 10 permanent jobs in the operational phase)

.....POTENTIAL BENEFITS

- Increase in economic opportunities in the area e.g. Security services, cleaning services, transport, etc
- General enhancement of the quality of life in the Erongo Region and the surrounding area.

Additional issues and discussions?

Thank you for making decisions with us

- Please complete the attendance list……..
- Our contact details:

Chris Ailonga
Matrix Consulting Services
P O Box 25824; Windhoek
Tel: + 264 61 224197
Fax: + 264 61 212165
E-mail: chris@matrixconsultingcc.com

Appendix J

KARIBIB 5 MW SOLAR PV PLANT EIA

Vegetation Specialist Study

Prepared by F. Kangombe *(MSc Plant Ecology, UP)*

For: Matrix Consulting Services

Date: 10 July 2015

1. BACKGROUND AND INTRODUCTION

Metdecci Energy Investment (Pty) Ltd has proposed to set up a solar PV Plant facility in Karibib, on an allocated 15.2Ha Plot, of which the developmental footprint will be 6Ha. Metdecci Energy Investment (Pty) Ltd aims at meeting the growing demand for energy in the country. In order support developmental activities that are in harmony with our conservation goals in Namibia (as guided by the Environmental Management Act (No. 7 of 2007) and to reduce the impacts of this proposed development on the environment, an EIA process is undertaken; of which this report forms part of the ecological specialist study.

The Vegetation Impact Assessment for the Karibib Solar Energy Project was informed by a literature desktop study of the flora (i.e. larger trees/shrubs and grasses) expected to occur in the Karibib area. To confirm the species and identify those of important conservation value, a field survey was undertaken on 27th June 2015 as well as to determine habitats/areas that would potentially be impacted by the proposed development project. A rapid vegetation assessment was carried out, at three fixed locations; where a comprehensive inventory of all species occurring at each site were recorded in a 20 m X 20 m plot, taking note of their growth forms and occurrence. For the third plot, a cumulative species list was compiled. The list of species was further compared against various literature sources (Curtis & Mannheimer 2005; Loots 2005; Muller 2007; Curtis & Mannheimer 2009; Mannheimer 2012) for conservation status in order to make informed recommendations for this development.

2. FINDINGS

The vegetation at the proposed site shows evidence of previous clearing as supported by only a few scattered shrub and tree species, not more than 5 m in height. A total of 12 tree/shrub species were encountered at this site, with only one tree species *Parkinsonia africana* (see appendix A, below) which are protected under the **Forestry Act (Act 12 of 2001)** in Namibia. These are associated with several indigenous grass and herb species (Appendix 1), including the disturbance indicators *Aristida adsceinsioinis, Dicomato mentosa Geigeria pectidea* and *Puppalia lappacea*.Since the survey was not conducted during the peak flowering season, some grasses were rather challenging to identify to species level. With only one specially protected tree species (*P.africana*), it is recommended that the proposed development can resume on condition that this species is given special attention and taken into consideration during development. The species is protected under the **Forestry Act (Act 12 of 2001)** in Namibia. No red-listed species were

encountered during the survey. All species occurring at each surveyed location and are listed in the appendix (attached).

With the amount of energy (5MW) that this project is expected to produce to meet the needs of this growing mining town, this project will notably contribute to sustainable development and reduce the carbon footprint through this progressive diversification of alternative energy sources. As solar energy harvesting is considerably a 'green' energy activity with a mere mounting of solar panels at a suitable location, this semi-cleared proposed site provides an apt environment for this activity to take place. Only minimal environmental impacts, possibly associated with initial infrastructure set-up are anticipated from this project. Additionally, for the safety of the equipment it is recommended that the facility be set-up at the proposed site as opposed to a more remote location.

Availing a few hectares within the boundaries of the town for this informed and promising development could be a small price to pay considering the direct benefits in the form of employment, increased energy production and supply, which will benefit the local economy and inhabitants of this fast expanding urban settlement. It is also worth mentioning the considerable termite activity that was noted at the site owing to the abundant carbon-rich material at the site. With this in mind, it is recommended that termite-resistant materials are used to set-up the desired infrastructure.

3. CONCLUSIONS AND RECOMMMENDATIONS

With only one specially **protected** species *P. africana*, that was noted and for which specific recommendations have been made, this assessment supports the approval of the intended development. A comprehensive list of all plant species occurring at each surveyed location has been provided to the EIA consultant for inclusion into the EMP for this project. It is recommended that any trees with a stem circumference of more 150mm should be avoided, and conserved, with the exclusion of invader species and should as far as possible be planned/factored into the anticipated development. The proposed project will not have significant impacts on the surrounding vegetation.

4. Selected References

CURTIS, B. AND MANNHEIMER, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek, Namibia.

LOOTS, S. 2005. Red Data Book of Namibian Plants.Southern African Botanical Diversity Network Report, No 38.SABONET, Pretoria & Windhoek.

MANNHEIMER, C. 2012.Wildflowers of the Central Highlands of Namibia.Macmillan Namibia Pty (Ltd), Windhoek.

MANNHEIMER, C. and Curtis, B. (eds) 2009. Le Roux and Müller's field guide to the trees and shrubs of Namibia. Macmillan Education Namibia, Windhoek.

MENDELSOHN, J., JARVIS, A., ROBERTS, C. AND ROBERTSON, T. 2002.*Atlas of Namibia: A portrait of the land and its people*. David Philip Publishers, Cape Town.

MÜLLER, M.A.N. 2007. Grasses of Namibia.John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.

Appendix A: ***Parkinsonia africana*** **(Fabaceae)**

Courtesy: Norbert Jürgens via the onlinePhoto Guide to Plants of Southern Africa

http://www.southernafricanplants.net/plantdata_sub.php?Mspec_ID=4726

Karibib Solar Energy Project

Waypoint_KB1	S21°56'56.7"	E017°01'52.7"	
Elevation/GPS Accuracy	1175		5

	Growth Form	Conservation status	Indigenous/Alien
Acacia tortilis	T/S	None recorded,	I
Acacia senegal	T/S	None recorded,	I
Boscia foetida	T/S	None recorded,	I
Catophractes alexandrii	S	None recorded,	I
Leucosphaera bainesii	S	None recorded,	I
Cenchrus ciliaris	G	None recorded,	I
Aristida hochsteteriana	G	None recorded,	I
Stipagrostis sp.	G	None recorded,	I
Eragrostis sp.	G	None recorded,	I
Enneapogon cenchroides	G	None recorded,	I
Enneapogon desvauxii	G	None recorded,	I
Entoplocamia aristulata	G	None recorded,	I
Eragrostis cilianensis	G	None recorded,	I
Dicoma schinzii	H	None recorded,	I
Emilia marlothiana	H	None recorded,	I

Key to codes

Tree/Shrub	T/S
Shrub	S
Grass	G
Herb	H
Perennial Herb	PH
Succulent Shrub	SS
Geophyte	G
Bulb	B

F: Protected by the Forestry Act (Act 12 of 2001)

Waypoint_KB2	S21°57'02.1"	E015°50'02.4"	
Elevation/GPS Accuracy	1175	5	

	Growth Form	Conservation status	Indigenous/Alien
Acacia tortilis	T/S	None recorded,	I
Acacia senegal	T/S	None recorded,	I
Parkinsonia africana	T/S	F	I
Lycium boscifolium	S	None recorded,	
Acacia reficiens	T/S	None recorded,	
Phaeoptilum spinosum	S	None recorded,	I
Adenolobus garipensis	S	None recorded,	I
Leucosphaera bainesii	S	None recorded,	I
Eragrostis echinochloidea	G	None recorded,	
Aristida adsceinsioinis	G	None recorded,	
Stipagrostis sp.	G	None recorded,	
Eragrostis sp.	G	None recorded,	
Enneapogon cenchroides	G	None recorded,	
Entoplocamia aristulata	G	None recorded,	
Eragrostis nindensis	G	None recorded,	
Enneapogon desvauxii	G	None recorded,	
Dicoma tomentosa	H	None recorded,	
Geigeria pectidea	H	None recorded,	
Puppalia lappacea	H	None recorded,	

Key to codes

Tree/Shrub	T/S
Shrub	S
Grass	G
Perennial Herb	PH
Succulent Shrub	SS
Geophyte	G
Bulb	B

F: Protected by the Forestry Act (Act 12 of 2001)

Waypoint_KB3	S21°56'56.8"	E015°50'11.5"	
Elevation/GPS Accuracy	1176		5

	Growth Form	Conservation status	Indigenous/Alien
Acacia mellifera	T/S	None recorded, invader bu	I
Grewia flavescens	S	None recorded,	
Monechma genistifolium	PH	None recorded,	
Leucas pechuelii	PH	None recorded,	

Only species not previously encountered (at the other two surveyed sites) were recorded at this site.

Key to codes

Tree/Shrub	T/S
Shrub	S
Grass	G
Perennial Herb	PH
Succulent Shrub	SS
Geophyte	G
Bulb	B

F: Protected by the Forestry Act (Act 12 of 2001)

Appendix K

CURRICULUM VITAE

Mize SHIPPIKI

NAME OF FIRM	:	**Matrix Consulting Services**
NAME OF STAFF	:	**Mize Shippiki**
YEAR OF BIRTH	:	**1976**
NATIONALITY	:	**Namibian**
QUALIFICATIONS	:	**B.Sc Physics and Chemistry**
		B.Sc (Hon) Hydrogeology
COMPANY	:	**Matrix Consulting Services**
COMPANY POSITION	:	**Principal Hydrogeologist/MD**

KEY QUALIFICATIONS

Mr Shippiki a fully qualified Namibian Hydrogeologist with an Honors degree in Geohydrology obtained from the University of the Free State. He is a self-motivated University graduate who has gained over 12 years experience in the Namibian water and environmental industry. He has excellent experience and knowledge in groundwater exploration, resource evaluation, urban and rural water supply, groundwater management, monitoring and evaluation of groundwater pollution and hydrochemistry.

Mr Shippiki's experience in the groundwater field has been gained from various projects ranging from water supply projects to aquifer evaluation studies and environmental impact assessments. Mr Shippiki has successfully sited and drilled over 100 boreholes in Namibia during the 2013-2014 Drought Relief Programme.

EDUCATION

2013		M.Sc. Environmental Management ***(candidate)***
		University of the Free State
2002	:	B.Sc. (Hons.) Geohydrology
		University of the Free State
2000	:	B.Sc Physics and Chemistry
		University of Namibia

EMPLOYMENT RECORD

June 2011 till now : ***Matrix Consulting Services***

Principal Hydrogeologist / Environmental Practitioner

Project management, exploration and drilling of groundwater resources, including aquifer testing. Supervision and approval of the quality and progress of the drilling and testing contractors' activities. This includes borehole positioning, drilling, casing, development and pumping test of water supply and environmental monitoring holes.

Hydrogeological baseline studies and groundwater monitoring. Water quality sampling, quality control and interpretation of resultant data. Analysis and interpretation of geophysical, water quality, geological and pumping test data.

Project management and assessment of subsurface hydrocarbon contaminations. Numerous groundwater pollution investigations, monitoring and preparation of factual environmental conditions reports.

Project management and complete preparation of environmental impact assessments (EIAs), environmental management plans (EMPs) and related works, of which most were related to fuel facilities, township developments, road developments, landfill developments, bulk water supply pipelines, mineral and oil/gas exploration, chemical warehouses and hotels. This also includes undertaking the hydrogeological components of various (EIAs) and implementation of EMPs.

2006 –June 2011 : ***Geo Pollution Technologies (Pty) Ltd***
Senior Hydrogeologist

Project management, exploration and drilling of groundwater resources, including aquifer testing. Analysis of borehole and aquifer parameters for construction and management purposes. Subsurface pollution investigations and remediation thereof.

Project management and complete preparation of environmental impact assessments, environmental management plans and related work.

2003-2006 : ***Water Sciences Cc***
Hydrogeologist

Groundwater exploration and drilling, including aquifer testing. Project management and preparation of numerous environmental impact assessments, of which a large number were related to water resources, petroleum and mining industries.

2008 : ***University of Namibia (Department of Chemistry /Physics)***
Chemist/Laboratory Technician

PROFESSIONAL SOCIETY AFFILIATION:

Namibian Hydrogeological Association (NHA)

AREAS OF EXPERTISE

Knowledge and expertise in:

- environmental impact assessments
- groundwater monitoring
- project management
- hydrocensus
- hydrogeological data evaluation and interpretation
- groundwater exploration and resource evaluation
- geophysical interpretations
- urban and rural water supply
- groundwater management
- borehole siting, drilling and test pumping supervision for groundwater projects
- aquifer testing
- test-pumping analysis on aquifers
- monitoring and evaluation of groundwater pollution

- hydrochemistry studies

PROJECT EXPERIENCE:

ITEM	*CLIENT*	*PROJECT*
1	*City of Windhoek*	*Groundwater specialist study for the development of the Haloid Industrial Township (the old Ramatex Textile Factory) - Windhoek.*
2	*ASM Investment Cc*	*Environmental and socio-economic Impact assessment, The proposed FAZ Fuel retail fuel facility at Onathinge, in Oshikoto region.*
3	*Putwavanga Investment Cc*	*Environmental and socio-economic Impact assessment, The proposed Okarokape Fuel retail fuel facility in Otjinene, in Otjozondjupa region.*
4	*Mr Renard Hattingh*	*Environmental and socio-economic Impact assessment, The proposed Divindu Fuel retail fuel facility at Divundu, in Kavango Region.*
5	*Grinaker-LTA*	*Water supply for the provision of Road construction MR100*
6	*The Roads Authority of Namibia*	*Professional Services for the provision of Road construction water MR67*
7	*City of Windhoek*	*Groundwater pollution monitoring of the City of Windhoek boreholes.*
8	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 10 (ten) boreholes in the Kunene Region for the Ministry of Lands and Resettlement (MLR).*
9	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 5 (five) boreholes in the Khomas Region for the Ministry of Lands and Resettlement (MLR).*
10	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 6 (six) boreholes in the Caprivi Region for the Directorate of Water Supply and Sanitation*

		Coordination (DWSSC).
11	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 2 (two) boreholes in the Erongo Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
12	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 10 (ten) boreholes in the Omaheke Region for the Office of the Prime-Minister (OPM).*
13	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 15 (fifteen) boreholes in the Kunene Region for the Office of the Prime-Minister (OPM).*
14	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 17 (seventeen) boreholes in the Karas Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
15	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 14 (fourteen) boreholes in the Omusati Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
16	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 13 (thirteen) boreholes in the Oshikoto Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
17	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 13 (thirteen) boreholes in the Otjozondjupa Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
19	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 20 (twenty) boreholes in the Ohangwena Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
20	*Ministry of Agriculture, Water and Forestry*	*Siting and Drilling Supervision of 26 (twenty-six) boreholes in the Omaheke Region for the Directorate of Water Supply and Sanitation Coordination (DWSSC).*
21	*City of Windhoek*	*Groundwater specialist study for the development of the Health Care Risk Waste facility (HCRW) – Windhoek.*

23	*City of Windhoek*	*Hydrogeological specialist study for the Windhoek Managed Artificial Aquifer Recharge Project.*
24	*Ino Investment /City of Windhoek. (PPP)*	*Groundwater specialist study for the development of the Otjomuise Extension 5 Township – Windhoek.*
25	*City of Windhoek*	*Groundwater specialist study for the development of the Rocky Crest South Extension 4-9 Township - Windhoek.*
26	*City of Windhoek*	*Hydrogeological specialist study of gas extraction at Kupferberg Landfill Site.*
27	*City of Windhoek*	*Environmental and socio-economic Impact assessment, The proposed Rocky Crest Extensions (4-9) Township Development.*
28	*Ino Investment /City of Windhoek. (PPP)*	*Environmental and socio-economic Impact assessment, The proposed Otjomuise Extension 5 Township Development.*
29	*Ark Industries Namibia (Pty) Ltd*	*Environmental and socio-economic Impact assessment, The proposed Green City Model in Otavi.*
30	*Olundjinda Mining (Pty) Ltd*	*Environmental and socio-economic Impact assessment, The proposed Olundjinda Mining exploration, Namib Naukluft, Karas region*
31	*Broll Namibia (O & L)*	*Environmental and socio-economic Impact assessment, The proposed Kempinski Strand Hotel, Erongo region.*
32	*City of Windhoek*	*Environmental and socio-economic Impact assessment, The proposed Kupferberg Landfill gas extraction, CDM project.*
33	*Shell Namibia LTD*	*Environmental Management Plan for the Operations and Decommissioning phase of the Shell Windhoek Fuel depot.*
34	*Mr Joel Uugulu*	*Environmental and socio-economic Impact assessment, The proposed Onathinge Fuel retail fuel facility at Onathinge, in Oshikoto region.*

35	Kanutus Trading	Environmental and socio-economic Impact assessment, The proposed Three Stars Fuel retail fuel facility in Omusati region.
36	Shakalimbo Estates	Environmental and socio-economic Impact assessment, The proposed Onhuno Fuel retail fuel facility in Ohangwena region
37	St Anslem Orchard Project	Environmental and socio-economic Impact assessment, The proposed St Anslem Orchard Project, Omusati Region.
38	Parsons Brickerhoff Africa (Pty) Ltd	Public Participation for the Environmental and socio-economic Impact assessment, The proposed Health Care Waste Facility in Windhoek.
39	CSG Energy Namibia (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling at Machita Village, Caprivi Region.
40	CSG Energy Namibia (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling in the Huab Block, Kunene Region.
41	Salute Trading (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed Chemical warehouse in Windhoek.
42	Petrotek Namibia (Pty)Ltd	Environmental and socio-economic Impact assessment, The proposed Petrotek Fuel retail fuel facility at HKIA Airport, Windhoek.
43	Shell Namibia Ltd	Environmental and socio-economic Impact assessment, The proposed Lafrenz Fuel retail fuel facility in the northern Industrial area, Windhoek.
44	Sun Square Hotel (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed 4-star Hotel, in Oshikango
45	Jack Kapolo	Environmental and socio-economic Impact assessment, The proposed Omafo Shell Fuel retail fuel facility in Ohangwena region

46	Wenela Service Station	Environmental and socio-economic Impact assessment, The proposed Wenela Shell Fuel retail fuel facility in Katima Mulilo.
47	Erno Van Wyk	Environmental and socio-economic Impact assessment, The proposed B-One Shell Fuel retail fuel facility in Rehoboth.
48	Marylin Properties (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed Ongha Shell Fuel retail fuel facility in Ohangwena Region
49	Shell Namibia Ltd	Environmental and socio-economic Impact assessment, The proposed Kaap Agri Shell Fuel retail fuel facility , Rehoboth
50	Frieda Linda Shikangala	Environmental and socio-economic Impact assessment, The proposed Ongha Shell Fuel retail fuel facility in Ohangwena Region
51	JF Nakanwe	Environmental and socio-economic Impact assessment, The proposed Onayena Shell Fuel retail fuel facility in Oshikoto Region
52	Skorpion Zinc Mine	Hydrocarbon pollution investigations /Bioremediation of polluted soil.
53	Petrotek Namibia (Pty)Ltd	Project Management and construction supervision of the proposed Petrotek Fuel retail fuel facility at HKIA Airport, Windhoek.
54	Kings Service Station	Environmental and socio-economic Impact assessment, The proposed Total Fuel retail fuel facility in Oniipa.
55	Kaap Agri	Environmental and socio-economic Impact assessment, The proposed Shell Fuel retail fuel facility in Rehoboth.
56	City of Windhoek	Environmental and socio-economic Impact assessment, The proposed managed aquifer recharge project.
57	Gemini Minerals (Pty) Ltd	Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling , August 26 EPL,

		Khomas Region.
58	*Gemini Minerals (Pty) Ltd*	*Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling, Fortitude EPL, Khomas Region.*
59	*UNAM-GKA*	*Environmental and socio-economic Impact assessment, The proposed New Campus, Keetmanshoop, Khomas Region.*
60	*NAMIBIA WILDLIFE RESORTS (NWR)*	*Environmental management plans for Hobas and Naukluft camp, Karas Region*
61	*Namibia Development Corporation (NDC)*	*Environmental and socio-economic Impact assessment, The proposed NDC Kalkfeld Fuel retail facility, Kalkfeld.*
62	*Kobra Investments cc*	*Environmental and socio-economic Impact assessment, The proposed Oshikuku Fuel retail facility, Oshikuku.*
63	*Puma Energy Namibia Ltd*	*Environmental and socio-economic Impact assessment, The proposed Oluzizi Fuel retail facility, Outapi.*
64	*Puma Energy Namibia Ltd*	*Environmental and socio-economic Impact assessment, The proposed Henties Bay Fuel retail facility, Henties Bay.*
65	*Soft Cloud Investments (Pty) Ltd*	*Environmental and socio-economic Impact assessment, The proposed Gobabis Fuel retail facility, Gobabis.*
66	*A & S Entertainment*	*Environmental and socio-economic Impact assessment, The proposed Ongwediva Fuel retail facility, Ongwediva.*
67	*Ruacana Town Council*	*Environmental Management Plans, The existing waste disposal site, Ruacana.*
68	*Min of Agric, Water and Forestry*	*Environmental and socio-economic Impact assessment, The proposed Okahao-Iitapa pipeline*
69	*Namibia Diamond Corporation (Namdeb)*	*Daberas Hydrogeological Study, Namdeb Orange River Mines (Including the evaluation of three fine tailings options on the environment and in particular the groundwater and interrelated surface water resources).*
70	*Valencia Uranium Project (Pty) Ltd*	*Siting and Drilling Supervision of 5 (five) boreholes in the Khan River for groundwater monitoring purposes.*
71	*Valencia Uranium Project (Pty) Ltd*	*Siting and Drilling Supervision of 9 (nine) boreholes at the Valencia Uranium mine, for groundwater supply and monitoring purposeses.*

72	Shell Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Nabta Service Station in Windhoek (Including Soil Vapour Survey, tank pit screening).
73	Total Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Total Fuel Depot in Walvis Bay (Including Soil Vapour Survey, groundwater monitoring).
74	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Shali Garage at Oshivelo (Including tank pit screening).
75	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Karasburg Service Station in Karasburg (Including tank pit screening)
76	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Martins Garage in Tsumeb (Including Soil Vapour Survey, groundwater monitoring).
77	Engen Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Okakarara Service Station in Okakarara (Including Soil Vapour Survey, bioremediation site installation).
78	Engen Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Jakaranda Service Station in Otjiwarongo (Including Soil Vapour Survey, groundwater monitoring).
79	Engen Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Academia Service Station in Windhoek (Including Soil Vapour Survey, tank pit screening).
80	Namibia Diamond Corporation (Namdeb)	Hydrocarbon Pollution Investigations, MA1 at Oranjemund (Including Soil Vapour Survey, bioremediation site installation). Hydrocarbon Pollution Investigations, Tal Service Station in Wi76ndhoek (Including Soil Vapour Survey).
81	BP Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, BP Fuel Depot in Otjiwarongo (Including Soil Vapour Survey, groundwater monitoring).
82	Engen Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Narraville Service Station in Walvis Bay (Including Soil Vapour Survey, groundwater monitoring).
83	Shell Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Omega Service Station in Walvis Bay (Including Soil Vapour Survey, groundwater monitoring).
84	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Express Service Station in Walvis Bay (Including Soil Vapour Survey, groundwater monitoring).
85	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Prestige Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).
86	Chevron Namibia (Pty) Ltd	Hydrocarbon Pollution Investigations, Hakahana Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).

87	*Engen Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Klingenberg Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).*
88	*Engen Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Jan Jonker Service Station in Windhoek (Including Soil Vapour Survey) Public Participation).*
89	*Engen Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Theatre Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).*
90	*BP Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, BP Fuel Depot in Gobabis (Including Soil Vapour Survey).*
91	*BP Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, BP Fuel Depot in Keetmanshoop (Including Soil Vapour Survey).*
92	*Shell Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Croesers Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).*
93	*BP Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Novel Ford Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).*
94	*Shell Namibia (Pty) Ltd*	*Hydrocarbon Pollution Investigations, Okuryangava Service Station in Windhoek (Including Soil Vapour Survey, groundwater monitoring).*
95	*Namibia Airports Company (NAC)*	*New Fuel Pipeline Corrosivity Study – Hosea Kutako International Airport.*
96	*Namibia Airports Company (NAC)*	*Waste Management Study – Hosea Kutako International Airport.*
97	*Namibia Airports Company (NAC)*	*Waste Management Study – Rooikop Airport (Walvis Bay International Airport).*
98	*Namibia Airports Company (NAC)*	*Groundwater Investigation – Hosea Kutako International Airport*
99	*Ministry of Agriculture, Water and Rural Development*	*2002/3 Drought Relief Programme Kunene North - Rural Water Supply*
100	*Ministry of Agriculture, Water and Rural Development*	*2002/3 Drought Relief Programme Kunene South - Rural Water Supply*
101	*Ministry of Agriculture, Water and Rural Development*	*2002/3 Drought Relief Programme Omaheke - Rural Water Supply*

102	*Ministry of Agriculture, Water and Rural Development*	*2002/3 Drought Relief Programme Otjozondjupa.*
103	*Ministry of Agriculture, Water and Rural Development*	*2002/3 Rural Water Supply Kunene North.*
104	*De Beers Marine Namibia/ Namdeb (PTY) LTD*	*Environmental Impact assessment, Bwabwata Exploration/Drilling of diamond exploration in Caprivi Region.*

LANGUAGES

	SPOKEN	*READ*	*WRITTEN*
English	Excellent	Excellent	Excellent
Afrikaans	Good	Good	Fair
Oshiwambo		Mother Tongue	

CERTIFICATION

By my signature below I certify the correction of the information above. 2

Signature

CURRICULUM VITAE

Chris Elungi AILONGA

NAME	:	**Chris E. Ailonga**
YEAR OF BIRTH	:	**1983**
NATIONALITY	:	**Namibian**
QUALIFICATIONS	:	**BSc Environmental Biology and Microbiology**
		MSc Environmental Science
COMPANY	:	**Matrix Consulting Services**
COMPANY POSITION	:	**Environmental Specialist/MD**

KEY QUALIFICATIONS

Chris is an experienced specialist in the preparation of environmental and socio-economic impact assessments, environmental management plans, mine environmental management, pollution investigations, environmental awareness training, environmental auditing, health and safety plans, and related work.

EDUCATION

2011		IRCA ISO14001 Lead Auditor Certificate *TUV Rheinland*
2010	:	MSc Environmental Science *University of Witwatersrand*
2007	:	Cleaner Production Best Practice in the Mining Industry, NQF Level 5 *University of Witwatersrand*
2005	:	BSc Environmental Biology and Microbiology *University of Namibia*

EMPLOYMENT RECORD

June 2011 till now : ***Matrix Consulting Services***

Project management and complete preparation of environmental impact assessments, environmental management plans and related work, of which most were related to Coal Bed Methane exploration, Gold exploration projects, fuel retail and consumer facilities, roads, bulk water supply pipelines, aquifer recharge projects, medical waste treatment facilities, chemical warehouses and hotels. Pollution investigations, environmental monitoring and reporting.

2010 –June 2011 : ***Consulting Services Africa***

EIA Specialist

Project management and complete preparation of environmental impact assessments, environmental management plans and related work, of which were mostly related to infrastructure (e.g roads), agriculture (e.g. fertilisers and quarantine camps)

2009 : ***Geo Pollution Technologies***

Environmental Consultant

Project management and preparation of numerous environmental impact assessments, of which a large number were related to water resources, petroleum and hydrogeology.

2008	:	***ALS Laboratory Group (Trekkoptje Uranium Mine)*** *Senior Chemical Laboratory Scientist*
2007	:	***NAMDEB*** *Environmentalist*
2006		***SANTED*** *Researcher*

PROFESSIONAL EXPERIENCE

- Environmental Impact Assessment
- Environmental Management (Monitoring Plan)
- Socio-economic Assessments
- Pollution Investigation
- Environmental Auditing
- Mine Environmental Management
- Health and Safety Plans
- Environmental laws and regulations compliance reporting

PROJECT EXPERIENCE

Environmental Impact Assessments (EIAs) –all including EMPs and Public Participation

EIA	Client
Environmental and socio-economic Impact assessment, The proposed Otjinene Phase 6 Township	Omaheke Regional Council
Environmental and socio-economic Impact assessment, The proposed Kobra Service Station in Oshikuku.	Namibia Funeral Services
Environmental and socio-economic Impact assessment, The proposed new Township development	Kalkrand Village Council
Environmental and socio-economic Impact assessment, The proposed Xpress Service Centre in Walvis Bay.	Walvis Bay Xpress Service Centre cc
Environmental and socio-economic Impact assessment, The proposed Onathinge Service Station in Onathinge.	ASM Investment cc
Environmental and socio-economic Impact assessment, The proposed Onathinge Service Station in Onathinge.	Divundu Service Station cc
Environmental and socio-economic Impact assessment, The proposed Otjinene Service Station in Otjinene.	Otjinene Service Station cc
Environmental and socio-economic Impact assessment, The proposed new ONGOS Township development	NHE
Environmental and socio-economic Impact assessment, The proposed 5MW Solar Plant in Khorixas.	Welwitschia Solar
Environmental Management Plans, The existing solid waste	City of Windhoek

disposal sites (9), Windhoek.	
Environmental and socio-economic Impact assessment, The proposed Oasis fuel retail facility, Usakos.	Oasis Service Centre
Environmental and socio-economic Impact assessment, The proposed HALOID Township, Windhoek.	City of Windhoek
Environmental Impact Assessment and Environmental Management Plans, The proposed 40Km new dedicated Otavi Power supply 33Kv.	CENORED
Environmental Impact Assessment and Environmental Management Plans, The proposed new townships development Choto Portion (A-G).	Katima Mulilo Town Council
Environmental Impact Assessment and Environmental Management Plans, The proposed exploration phase of EPL 4953.	The Kongom Trading
Environmental Impact Assessment and Environmental Management Plans, The proposed new Otavi Service Station.	Engen South Africa
Environmental Impact Assessment and Environmental Management Plans, The proposed new townships (Khoaeb EXT 4 & 5 and Otavi EXT 5 & 6).	Otavi Town Council
Environmental Impact Assessment and Environmental Management Plans, The proposed new UNAM southern campus.	UNAM
Environmental Impact Assessment and Environmental Management Plans, The proposed new Otavi Landfill Otjozondjupa Region.	Otavi Town Council
Environmental Management Plans, The proposed Hobas and Naukluft Camp Upgrade, Karas Region.	Namibia Wildlife Resorts
Environmental and socio-economic Impact assessment, The proposed Okahao-Iitapa pipeline.	Min of Agriculture, Water and Forestry
Environmental and socio-economic Impact assessment, The proposed Windhoek Aquifer Project, Windhoek.	City of Windhoek
Environmental and socio-economic Impact assessment, The proposed Otavi Poultry Project.	Fresh Farm Chicken cc
Environmental and socio-economic Impact assessment, The proposed Otjomuise Ext 5 Township, Windhoek.	Ino Investment (Pty) Ltd/ City of Windhoek PPP
Environmental and socio-economic Impact assessment, The proposed Rocky Crest Ext 4-9 Township, Windhoek.	City of Windhoek
Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling at Machita Village, Caprivi Region.	CSG Energy Namibia (Pty) Ltd
Environmental and socio-economic Impact assessment, The	City of Windhoek

proposed Landfill Gas Extraction from Kupferberg Landfill, Windhoek.	
Environmental and socio-economic Impact assessment, The proposed Coal Bed Methane exploration drilling in the Huab Block, Kunene Region.	CSG Energy Namibia (Pty) Ltd
Environmental Management Plans, The proposed Ruacana Waste Disposal Site.	Ruacana Town Council
Environmental and socio-economic Impact assessment, The proposed Chemical warehouse in Windhoek.	Salute Trading (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed Petrotek Fuel retail fuel facility at HKIA Airport, Windhoek.	Petrotek Namibia (Pty)Ltd
Environmental and socio-economic Impact assessment, The proposed NDC Kalkfeld Fuel retail facility, Kalkfeld.	Namibia Development Corporation (NDC)
Environmental and socio-economic Impact assessment, The proposed Oshikuku Fuel retail facility, Oshikuku.	Kobra Investments cc
Environmental and socio-economic Impact assessment, The proposed Oluzizi Fuel retail facility, Outapi.	Puma Energy Namibia Ltd
Environmental and socio-economic Impact assessment, The proposed Henties Bay Fuel retail facility, Henties Bay.	Puma Energy Namibia Ltd
Environmental and socio-economic Impact assessment, The proposed Gobabis Fuel retail facility, Gobabis.	Soft Cloud Investments (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed Ongwediva Fuel retail facility, Ongwediva.	A & S Entertainment
Environmental and socio-economic Impact assessment, The proposed Lafrenz Fuel retail fuel facility in the northern Industrial area, Windhoek.	Shell Namibia (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed 4-star Hotel, in Oshikango	Sun Square Hotel (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed Omafo Fuel retail fuel facility in Ohangwena region	Jack Kapolo
Environmental and socio-economic Impact assessment, The proposed Wenela Fuel retail fuel facility in Katima Mulilo.	Wenela Service Station
Environmental and socio-economic Impact assessment, The proposed B-One Fuel retail fuel facility in Rehoboth.	Erno Van Wyk
Environmental and socio-economic Impact assessment, The proposed Ongha Fuel retail fuel facility in Ohangwena Region	Marylin Properties (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed Swakopmund Strand	Olthaver and List (Pty) LTD

Hotel , Swakopmund	
Environmental and socio-economic Impact assessment, The proposed Kaap Agri Fuel retail fuel facility , Rehoboth	Shell Namibia (Pty) Ltd
Environmental and socio-economic Impact assessment, The proposed upgrade of Omakange-Ruacana road (85km) to bitumen standards.	Min of Works and Transport
Environmental and socio- Impact assessment, The proposed upgrade of Omafo-Outapi (100km) road to bitumen standards.	Min of Works and Transport
Environmental Impact assessment, The proposed waste water treatment Plant, Oshakati.	Oshakati/Ongwediva Town Council
Environmental and socio-economic Impact assessment, The proposed quarantine camps in Katima and Kopano, Caprivi Region.	Millenium Challenge Account
Environmental Scoping Assessment, Beneficial Utilisation of biosolids at Gammams Waste Water Treatment Works, Windhoek	City of Windhoek
Environmental and socio-economic Impact assessment, The proposed fuel wholesale facility in Windhoek, Shared Petroleum	Shared Petroleum (PTY) LTD
Environmental Impact assessment, The proposed upgrade the fuel retail facility in Luderitz, Coastways Service Station	Engen Namibia (PTY) LTD
Environmental Impact assessment, The proposed expansion of the chemical handling facility at the port of Walvis Bay, Protea Chemicals Namibia - Omnia Group	Protea Chemicals Namibia (PTY) LTD Omnia Group
Environmental Impact assessment, The proposed bulk fuel storage facility in Walvis Bay, Merlus Properties	Merlus Properties (PTY) LTD
Environmental Impact assessment, The proposed bulk fuel storage facility in Rehoboth, St Mary's Hospital	St Mary's hospital
Environmental Impact assessment, The proposed upgrade the fuel retail facility in Windhoek, Eureka Service Station	Engen Namibia (PTY) LTD
Environmental Impact assessment, The proposed bulk fuel storage facility in Walvis Bay.	NAMCOR (PTY) (LTD)
Environmental Impact assessment, The proposed fuel retail facility in Ongwediva.	Querida's Enterprises/ Shell Namibia
Environmental Impact assessment, The proposed bulk fuel storage and consumer facilities in Karibib, Anglo Gold Mine.	Anglo Gold Ashanti - Navachab mine
Environmental Impact assessment, The proposed bulk fuel storage and consumer facilities at Langer Heinrich Mine, Erongo region	Langer Heinrich Uranium / Shell Namibia
Environmental Impact assessment, The proposed bulk fuel storage and consumer facilities at Hosea Kutako International Airport	Dollar Thrifty Car Rentals
Environmental Impact assessment, Bwabwata Exploration/Drilling of diamond exploration in Caprivi Region.	De Beers Marine Namibia/ Namdeb (PTY) LTD
Environmental Impact assessment, The upgrade of the BP Klein Windhoek Service Station.	BP Namibia (PTY) LTD / Klein Windhoek SS

Other Specialist/Scientific Work

Activity	Client
Environmental awareness training and environmental monitoring of the construction of MR122 (Okahao-Omakange Road).	Roads Authority
Daberas mine hydrogeological study	Namdeb (PTY) LTD
Daberas mine slimes disposal dam site selection	Namdeb (PTY) LTD
Surface and groundwater pollution risk assessment, as a specialist study for Environmental Impact Assessment, Oujere Lifestyle project, Von Bach Dam	Tutungeni Africa Investments (PTY) LTD
Environmental Fatal Flaw Screening, Site selection – Offshore mooring facilities,Walvis Bay	Namcor (PTY) LTD / Namport (PTY) LTD
Chemical Analysis of metallurgical and environmental samples at Trekkopje Mine.	Trekoppje Mine
Pocket Beaches Site 2 Environmental Closure Audit.	Namdeb (PTY) LTD
Daberas Mine Water Quality Assessment.	Namdeb (PTY) LTD
Pollution Investigation, Impact assessment studies on the impact of the Daberas mine tailings dam seepage on the water quality of the Orange River and Riparian Vegetation.	Namdeb (PTY) LTD
Biodiversity Impact Assessment-Power line wayleave on Inhaca island in Mozambique.	SANTED

LANGUAGES

	SPOKEN	*READ*	*WRITTEN*
English	Excellent	Excellent	Excellent
Afrikaans	Fair	Fair	Fair
Oshiwambo		Mother Tongue	