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Consultation BA Report

CONSULTATION BASIC ASSESSMENT REPORT FOR THE PROPOSED DOUBLE CIRCUIT 132 KV POWERLINE EXTENDING FROM RHODES 2 PV PLANT PASSING THROUGH RHODES1, EAST 3, EAST 2, AND EAST PV PLANTS, TO UMTU SUBSTATION NEAR HOTAZEL, JOE MOROLONG LOCAL MUNICIPALITY , JOHN TAOLO GAETSHWE DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

NOVEMBER 2019

Prepared for: Pleiades (Pty) Ltd
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Compiled by E Grobler



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November 2019

PROJECT APPLICANT

Company name: **Pleiades (Pty) Ltd- Reg. No. 2013/087811/07**
Contact Person: Mr. Ernst Burger / Ms. Izel van Rooy (town planner)
Physical Address: 4th Floor Aloe Grove, Houghton Estate Office Park, 2 Osborn Road, Houghton 2198 - South Africa
Postal Address: P.O. Box 225, Highlands North 2037, South Africa
Telephone Number: +27 (0) 86 599 3858
Fax Number: +27 (0) 86 599 3858
S.A. Mobile Number: +27 (0) 82 449 7626
E-mail: planwize@telkomsa.net

ENVIRONMENTAL ASSESSMENT PRACTITIONER

Company Name: AGES Limpopo (Pty) Ltd (Reg. No. 2006/020831/07)
Contact Persons: Ms. Engela Grobler
Physical Address: 120 Marshall Street, Polokwane, 0699, South Africa
Postal Address: P.O. Box 2526, Polokwane, 0700, South Africa
Telephone Number: +27 0(15) 291 1577
Fax Number: +27 (15) 291 1577
E-mail: **egrobler@ages-group.com**

AGES (Pty) Ltd

E Grobler (Environmental Scientist – M.Sc. Environmental Management (Univ of Stellenbosch))

.....
E Grobler
Environmental Scientist – M.Sc. Environmental Management

*LIMPOPO PROVINCE: 120 Marshall Street Polokwane 0699, P.O Box 2526 Polokwane 0700
Tel: +27-15-291 1577 Fax: +27 (0)15 291 1577 www.ages-group.com*

*Offices: Eastern Cape Gauteng Limpopo Province Namibia North-West Province Western Cape Northern Cape Kwa-Zulu Natal
AGES Limpopo Directors: JH Botha HP Jannasch THG Ngoepe*

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Municipal Manager: Mr. Tshepo Bloom	Joe Morolong Local Municipality
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Dr. P Lochner	Council for Scientific and Industrial Research (CSIR)
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1 OBJECTIVE OF THE EIA PROCESS

According to Regulation No R 982 of 4 December 2014, the objective of the EIA process is to, through a process of consultation:

- a. Identify the policies and legislation relevant to the study and how the study complies with the policies and legislation.
- b. Identify the alternatives considered, including the activity, location and technology alternatives
- c. Motivate the need and desirability of the proposed activity including the need and desirability of the activity in the context of the preferred location
- d. Identify the location of the development footprint within the preferred site based on an impact assessment and risk ranking process which includes cumulative impacts and a ranking process of all the identified alternatives focussing on the geographical, physical, biological, social, economic and cultural aspects of the environment.
- e. Determine the
 - a. Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform preferred alternatives; and
 - b. Degree to which these impacts
 - i. Can be reversed;
 - ii. May cause irreplaceable loss of resources, and
 - iii. can be avoided, managed or mitigated.
- f. Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment
- g. Identify site sensitivities and possible impacts that the activity and technology alternatives will impose on the sites and location identified through the life of the activity to
 - i. Identify and motivate a preferred site, activity and technology alternative.
 - ii. Identify suitable measures to avoid, manage or mitigate identified impacts and
 - iii. Identify residual risks that need to be managed and monitored.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name of EAP: AGES – E Grobler

Contact details of EAP:

Physical Address: 120 Marshall Street,
Polokwane, 0699

Telephone number: 015 291 1577

Fax number: 015 291 1577

Expertise of EAP: A Master's Degree in Environmental Management and 10 years of experience with the management and conducting of EIA's. A number of renewable energy projects which participated in the IPP Programme, issued 3rd August 2011 by the Department of Energy have been awarded Preferred Bidder Status. Curriculum Vitae of EAP is included in Appendix J.

3 LOCATION OF ACTIVITY

3.1 SURVEYOR GENERAL 21 DIGIT CODES OF DEVELOPMENT AREAS

The project is located within the Joe Morolong Local Municipality area of jurisdiction, John Taolo Gaetsewe District Municipality, Northern Cape Province. The proposed power lines will traverse the following farms: Rhodes 269; Remainder of East 270, Portion 2 of East 270, Kipling 271, Hotazel 280, Umtu 281 and Olive pan 282. The SG 21 Digit codes of the portions are:

C	0	4	1	0	0	0	0	0	0	0	0	0	2	6	9	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	2
C	0	4	1	0	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	0	2	7	1	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	0	2	8	0	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	0	2	8	1	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	0

Farm portion

21-digit SG Code

Remainder of Rhodes 269	C04100000000026900000
Portion 2 of East 270	C04100000000027000002
Remainder of East 270	C04100000000027000000
Remainder of Kipling 271	C04100000000027100000
Remainder of Hotazel 280,	C04100000000028000000
Remainder of Umtu 281	C04100000000028100000
Remainder of Olive pan 282	C04100000000028200000

3.2 PHYSICAL ADDRESS AND FARM NAME

The proposed 132 kV power line(double circuits) will traverse the following properties:

- Remainder of the farm Rhodes No. 269, Kuruman RD;
- Portion 2 of the Farm East No. 270, Kuruman RD;
- Remainder of the Farm East No. 270, Kuruman RD;
- Remainder of the farm Kipling No. 271, Kuruman RD;
- Remainder of the Farm Hotazel No. 280, Kuruman RD;
- Remainder of the farm Umtu No. 281, Kuruman RD;
- Remainder of the Farm Olive Pan No. 282, Kuruman RD;

3.3 COORDINATES OF THE POWER LINES ROUTE AND SWITCHING STATION

Corridor from the Rhodes 2 Solar Park to the Eskom Umtu substation (Linear Activity)

Points	Latitude (S) (DDMMSS)			Longitude (E) (DDMMSS)		
LP 1	27	10	21.3	22	57	00.6
LP 2	27	11	54.5	22	56	49.2
LP 3	27	12	13.5	22	56	55.9
LP 4	27	12	17.1	22	57	25.0
LP 5	27	12	19.1	22	57	27.1

Switching station and Loop-in and Loop-out 132 kV lines within the Power Line Corridor

Points	Latitude (S) (DDMMSS)			Longitude (E) (DDMMSS)		
Switching station	27	11	52.6	22	56	49.5
Loop-in line - start point	27	11	53.4	22	56	49.5
Loop-in line - end point	27	11	54.7	22	56	49.3
Loop-out line - start point	27	11	53.4	22	56	49.1
Loop-out line - end point	27	11	54.8	22	56	48.9

4 PLAN OF THE PROPOSED ACTIVITY

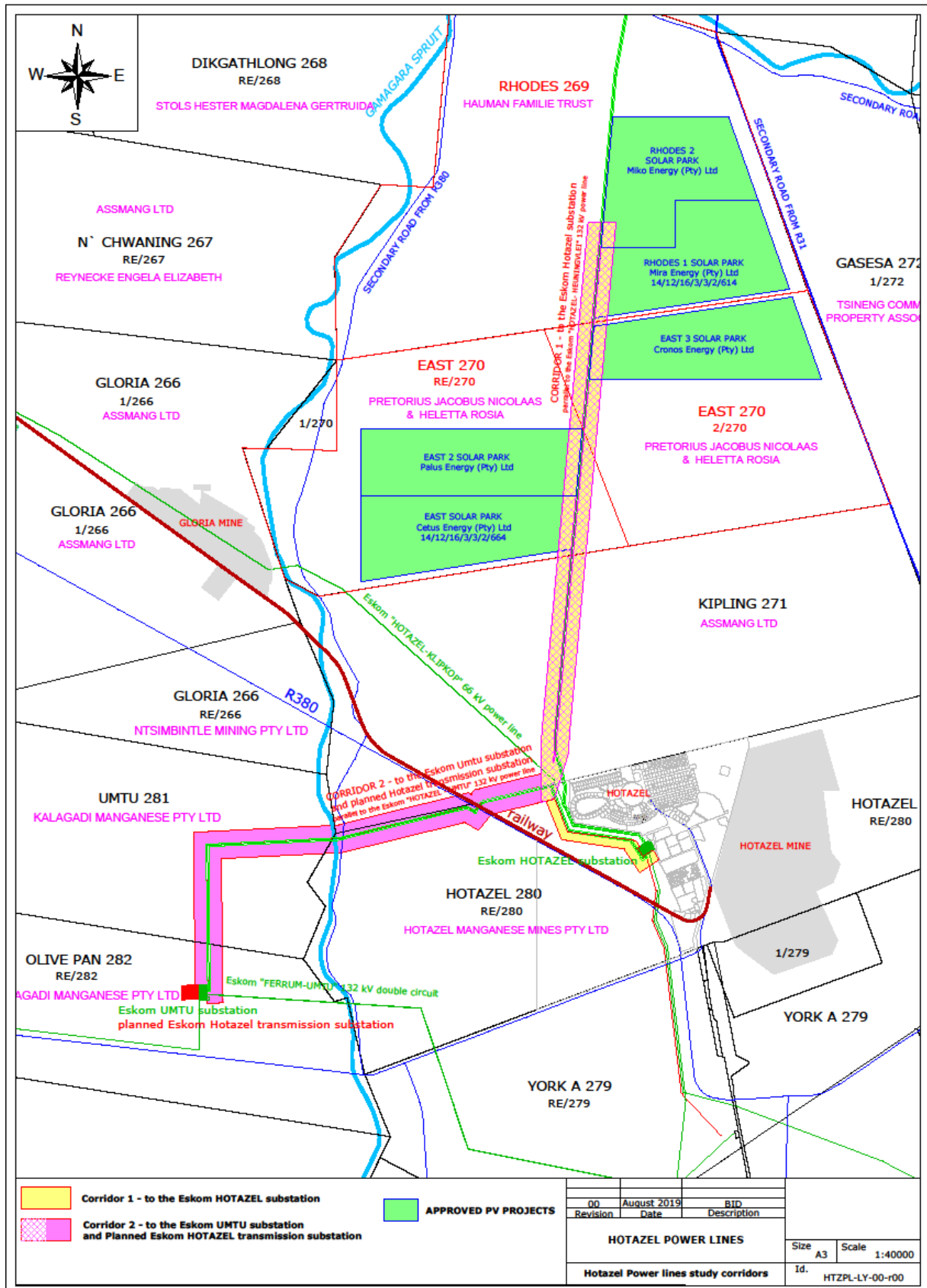


Figure 1 Location of the proposed Powerline from Rhodes 2 PV plant to ESKOM UMTU Substation

5 SCOPE OF THE PROPOSED ACTIVITY

5.1 LISTED ACTIVITIES TRIGGERED IN TERMS OF NEMA

Listed activity as described in GN R.983, 984 and 985 of 4 December 2014	Description of project activity that triggers listed activity
GN R.983 Item 11 <i>The development of facilities or infrastructure for the transmission and distribution of electricity -</i> <i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</i>	The construction and operation of two new 132 kV power lines (double circuits) for the connection of possibly four (4) Solar PV Plants, to the Eskom grid, <u>outside urban areas</u> , within the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape Province.
GN R.983 Item 24 <i>The development of –</i> <i>(ii) a road with a reserve wider than 13,5m, or where no reserve exists where the road is wider than 8m.</i>	A new access road (dirt road) will be constructed within the power line servitude, for the construction activities. This dirt road will be approximately 5 m wide. In correspondence of the turning points, the road reserve will be up to 14 m in order to allow the transportation of abnormal loads (steel monopoles).

5.2 DESCRIPTION OF ACTIVITIES AS WELL AS ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT

Pleiades (Pty) Ltd is proposing the construction and operation of **two new 132 kV power lines (double circuits)** for the connection to the Eskom grid of the proposed:

- **East 2 Solar Park - Palus Energy (Pty) Ltd (Reg. No. 2013/087976/07)**
- **East 3 Solar Park - Cronos Energy (Pty) Ltd (Reg. No. 2013/097343/07)**
- **Rhodes Solar Park - Mira Energy (Pty) Ltd (Reg. No. 2012/016683/07)**
- **Rhodes 2 Solar Park - Miko Energy (Pty) Ltd (Reg. No. 2013/097048/07)**

The two proposed 132 kV power lines (double circuits) will traverse the following properties:

- **Remainder of the Farm Rhodes No. 269, Kuruman RD;**
- **Portion 2 of the Farm East No. 270, Kuruman RD;**
- **Remainder of the Farm East No. 270, Kuruman RD;**
- **Remainder of the Farm Kipling No. 271, Kuruman RD;**
- **Remainder of the Farm Hotazel No. 280, Kuruman RD;**
- **Remainder of the Farm Umtu No. 281, Kuruman RD;**
- **Remainder of the Farm Olive Pan No. 282, Kuruman RD (Eskom Umtu substation);**

located in the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape Province.

Two proposed 132 kV power lines will connect East 2, East 3, Rhodes and Rhodes 2 Solar Parks to the new **Eskom Umtu substation**, 12.7 km south-west of the planned location of Rhodes 2 Solar Park.

The corridor depends on the Eskom connection solutions for the four Solar Parks, to be described in the Eskom Cost Estimate Letters, which has not been issued yet.

The new power lines will consist of a series of **steel or aluminium monopole structures** supporting the electrical cables (double circuit) and a communication cable, to be installed approximately 200 - 260 m apart. The proposed structures will be between 18 m and 25 m high and the basement of each pole will have a footprint of approximately 2.5 m².

The two proposed power lines will be designed as double circuits: **one circuit for each of the four projects**. The power line servitude (for the two double circuits) will be **66 m wide**.

If required, **a new access road (dirt road)** may be constructed within the power line servitude, for construction and maintenance activities.

The construction phase will last approximately **6 to 9 months** and will involve a team of **10 to 15 people**.

Monopole structures installation will not require the establishment of a permanent construction site, but will be done step-by-step, in order to only affect small stretches of corridor and for a short time.

The site preparation will consist of the clearing of the power line servitude; vegetation removal will be done only within the servitude, for the minimum width required by the installation activities and by the Eskom security rules: the vegetation should not interfere with the high-voltage cables.

In order to develop the power lines, **Pleiades (Pty) Ltd** must undertake an **Environmental Basic Assessment process** and acquire Environmental Authorization from the National Department of Environmental Affairs (DEA), in consultation with the *North Northern Cape Department of Environment and Nature Conservation* (DENC), under the terms of the EIA Regulations, 2014 published on 4 December 2014 as amended in terms of Section 24(5) and 44 of the National Environmental Management Act (NEMA, Act No. 107 of 1998).

The independent Environmental Assessment Practitioner (EAP) which has been appointed for the undertaking of the detailed environmental studies in compliance with the EIA Regulations, 2014 as amended is **AGES Limpopo (Pty) Ltd**.

With the aim of identifying and assessing all potential environmental impacts related to the development as well as suggesting possible mitigation measures and alternatives, AGES has appointed specialist sub-consultants to compile detailed reports and to study the activities necessary for the assessment of the specific impacts related to their field of expertise.

AGES and the other specialist consultants are in a position of independency from **Pleiades (Pty) Ltd**; therefore they are not subsidiaries or affiliated to the latter. AGES and the specialist consultants have no secondary interest connected with the development of this project or of other projects which may originate from the authorization of the project.

The characteristics, the technology and the extent of the East 132 kV Power Line is defined and evaluated in this Basic Assessment Report (BAR) and its appendices.



Figure 2: Steel monopole structure for a 132 kV power line (double circuit)

6 LEGAL AND POLICY REQUIREMENTS

The following is a broad overview of the relevant policy and legal requirements related to the environment, applicable to the proposed project: Legislation is not limited to this list.

Table 1: Review of relevant legislation

National Legislation	Sections applicable to the proposed project
Constitution of the Republic of South Africa (Act no. 108 of 1996)	<ul style="list-style-type: none"> • Bill of Rights (S2) • Rights to freedom of movement and residence (S22) • Environmental Rights (S24) • Property Rights (S25) • Access to information (S32) • Right to just administrative action (S33)
Fencing Act (Act no. 31 of 1963)	<ul style="list-style-type: none"> • Notice in respect of erection of a boundary fence (S7) • Clearing bush for boundary fencing (S17) • Access to land for purpose of boundary fencing (S18)
Conservation of Agricultural Resources Act (Act no. 43 of 1983)	<ul style="list-style-type: none"> • Prohibition of the spreading of weeds (S5) • Classification of categories of weeds & invader plants and restrictions in terms of where these species may occur (Regulation 15 of GN R0148) • Requirement and methods to implement control measures for alien & invasive plant species (Reg 15E of GN R0148)
Environment Conservation Act (Act no. 73 of 1989)	<ul style="list-style-type: none"> • National Noise Control Regulations (GN R154 dated 10 January 1992)
National Water Act (Act no. 36 of 1998)	<ul style="list-style-type: none"> • Entrustment of the National Government to the protection of water resources (S3) • Entitlement to use water (S4) - Schedule 1 entitles a person to use water (reasonable domestic, domestic gardening, animal watering, firefighting and recreational uses)

	<ul style="list-style-type: none"> • Duty of Care to prevent and remedy effects of water pollution (S19) • Procedures to be followed in the event of an emergency incident which may impact on water resources (S20) • Definition of water use (S21) • Requirements for registration of water use (S26 and S34) • Definition of offences in terms of the Act (S151)
National Forests Act (Act no. 84 of 1998)	<ul style="list-style-type: none"> • Protected trees
National Environmental Management Act (Act no. 107 of 1998)	<ul style="list-style-type: none"> • Definition of National environmental principles (S2): strategic environmental management goals and objectives of the government applicable within the entire RSA to the actions of all organs of state, which may significantly affect the environment • NEMA EIA Regulations (GN R543, 544, 545, 546, & 547 of 18 June 2010) • new NEMA EIA Regulations 2014 (GN R. 982, 983, 984, 985 of 4 December 2014) • Requirement for potential impact on the environment of listed activities to be considered, investigated, assessed and reported on to competent authority (S24 - Environmental Authorisations) • Duty of Care (S28): requirement that all reasonable measures are taken in order to prevent pollution or degradation from occurring, continuing and recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment • Procedures to be followed in the event of an emergency incident which may impact on the environment (S30)
National Heritage Resources Act (Act no. 25 of 1999)	<ul style="list-style-type: none"> • SAHRA, in consultation with the Minister and the MEC of every province must establish a system of grading places and objects which form part of the national estate (S7) • Provision for the protection of all archaeological objects, paleontological sites and material and meteorites entrusted to the provincial heritage resources authority (S35) • Provision for the conservation and care of cemeteries and graves by SAHRA, where this is not responsibility of any other authority (S36) • List of activities which require notification from the developer to the responsible heritage resources authority, with details regarding location, nature, extent of the proposed development (S38) • Requirement for the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites for promotion of tourism (S44)
National Environmental Management: Biodiversity Act (Act no. 10 of 2004)	<ul style="list-style-type: none"> • Provision for the MEC for Environmental Affairs/Minister to publish a list of threatened ecosystems and in need of protection (S52) • Provision for the MEC for Environmental Affairs/Minister to identify any process or activity which may threaten a listed ecosystem (S53) Provision for the Member of the Executive Council for Environmental Affairs/Minister to publish a list of: critical endangered species, endangered species, vulnerable species and protected species (S56(1) - see Government Gazette 29657

	<ul style="list-style-type: none"> Three government notices have been published up to date: GN R150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R151 (Lists of critically endangered, vulnerable and protected species) and GN R152 (Threatened Protected Species Regulations)
National Environmental Management: Air Quality Act (Act no. 39 of 2004)	<ul style="list-style-type: none"> Provision for measures in respect of dust control (S32) Provision for measures to control noise (S34)
National Environmental Management: Waste Management Act (Act no. 59 of 2008)	<ul style="list-style-type: none"> Waste management measures Regulations and schedules Listed activities which require a waste licence
Northern Cape Nature Conservation Act (Act No. 9 of 2009)	<ul style="list-style-type: none"> Indigenous flora protected under this act No hunting to take place without a permit
Occupational Health and Safety Act (Act No. 85 of 1993)	<ul style="list-style-type: none"> Health and safety of all involved before and after construction must be protected.

7 NEED/DESIRABILITY FOR CONSTRUCTION OF TWO 132 KV POWER LINES

The purpose of the proposed **Hotazel 132 kV Power Lines (Double Circuits)** is to connect East 2, East 3, Rhodes and Rhodes 2 Solar Parks to the Eskom grid.

South Africa has a largely unexploited potential in renewable energy resources such as solar, wind, biomass and hydroelectricity to produce electricity as opposed to other energy types (fuel or coal). But South Africa's electricity supply still heavily relies upon coal power plants, whereas the current number of renewable energy power plants is still limited.

The use of renewable energy technologies is a sustainable way in which to meet future energy requirements.

The Department of Energy of South Africa (DoE) decided to undertake a detailed process to determine South Africa's 20-year electricity plan, called **Integrated Resources Plan 2010-2030 (IRP 2010)**. This IRP outlined the Government's vision, policy and strategy related to the use of energy resources and the current status of energy policies in South Africa.

In order to achieve the goals as set in the IRP, in 2011, the DoE announced a Renewable Energy IPP (Independent Power Producers) Procurement Programme (REIPPPP).

The new IRP was published on 18 October 2019, in which a new set of goals were identified to be met and include, *inter alia*, targets and goals, to be met with the assistance of the Renewable Energy IPP Procurement Programme.

8 MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE PREFERRED SITE

The purpose of the East 2, East 3, Rhodes and Rhodes 2 Solar Parks (and of the related **Hotazel 132 kV Power Lines**) is to add new capacity for the generation of renewable electrical energy to the national electricity supply in compliance with the aforementioned Renewable Energy Independent Power Producer Procurement Programme.

The use of solar radiation for power generation is considered as a non-consumptive use and a renewable natural resource which does not produce greenhouse gas emissions. With specific reference to photovoltaic energy and the proposed project, it is important to take cognisance of the fact that South Africa has one of the highest levels of solar radiation in the world.

Specific reasons why this particular site was chosen include the following:

- The proposed power line is in close proximity to approved PV plant sites
- The proposed power lines are adjacent to an existing ESKOM servitude for power lines
- The local mines and communities will reap benefits from the proposed development.

9 CONSIDERATION OF ALTERNATIVES

9.1 DETAILS OF ALTERNATIVES CONSIDERED

Activity Alternatives

The already approved solar parks require an Eskom connection in order to connect to the Eskom grid to provide energy. The activity takes place for the sole purpose of providing Eskom with energy in order to provide electricity.

Location Alternatives

There is no alternative to the activity as the Solar PV Parks have already been approved in the locations as described in the environmental authorizations and the Eskom infrastructure is established, owned and managed by Eskom, independently of the solar parks.

Technology Alternatives

The technology involved, include infrastructure for the provision of power lines from solar parks to the Eskom grid.

NO-GO Alternative

The no-go alternative is the option of not establishing the Hotazel 132 kV Power Line, and **infrastructure associated with the power lines**. If the Hotazel 132 kV Power Line is not developed, the **East 2 Solar Park (Palus Energy), East 3 Solar Park (Cronos Energy), Rhodes Solar Park (Mira Energy), & Rhodes 2 Solar Park (Miko Energy (Pty) Ltd)** will not be able to be connected to the Eskom grid, therefore the solar projects will not be established. The environment will remain in its current state (*status quo*).

Therefore:

- A) The environmental benefits - in terms of **air quality** - associated with the establishment of the proposed renewable energy generation facility (solar photovoltaic plant) **will not be achieved**. The electrical energy (electricity) generated by the proposed **Solar Parks** will reduce the quantity of pollutants and greenhouse gases emitted into the atmosphere. The reduced amount of pollutants and greenhouse gases corresponds to the emissions that would have been generated by a thermal power plant using fossil fuels for producing the same quantity of energy that can be produced by the proposed renewable energy project (solar photovoltaic plant).

-
- B) This will not create any new employment opportunities and the anticipated **economic benefits** of the solar project will accrue to the study area. The possible negative impacts of the impact of the proposed development on the land from utilising the land for the development will not take place.

9.2 DETAILS OF PUBLIC PARTICIPATION PROCESS UNDERTAKEN

A complete Comments and Responses report is attached to this report as Appendix C.

The initial public participation process was run from 2 September 2019 until 2 October 2019 and was done according to Chapter 6 of the EIA Regulations, 2014, as amended.

Proof of all actions taken during the process is included in the Comments and Responses Report as included in Appendix C.

The Consultation / Draft Basic Assessment Report will be made available for public comment for the prescribed period of 30 days. Proof of this will be included in the updated Comments and Responses Report in the Final Basic Assessment Report.

9.3 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

There were very few responses as a result of the public participation process but some interested which stemmed mainly from potential, future service providers in the area.

9.4 COMMENTS AND RESPONSES REPORT

Table with comments to be inserted

9.5 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE FOOTPRINT ALTERNATIVES

9.5.1 BIODIVERSITY AND ECOLOGICAL ASPECTS

An ecological and riparian/wetland impact assessment was done for the Hotazel double circuit 132 kV power lines. The assessment was done by Exigo3 (Henning 2019) and the following information presented are extracted and/or copied from the Ecological and Riparian Report, included in Appendix D.

The project site is located in the Savannah biome and the vegetation of the proposed development site falls within the south-eastern range of the Griqualand West Centre of Endemism. The Griqualand West Centre (GWC) is one of the 84 African centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The endemic and near-endemic species make up 2.2% of the total flora, and are mostly from the Asclepiadaceae, Euphorbiaceae and Mesembryanthemaceae families. Some of the endemics are edaphic specialists, adapted to lime-rich substrates. The conservation priority of this centre is nationally important.

The sites form part of the Kathu Bushveld and Gordonia Duneveld vegetation types. This Kathu Bushveld vegetation type has a Least Threatened conservation status, with 1% transformed and none statutorily conserved. The conservation status of the Gordonia Duneveld is Least Threatened with very little transformation and 14% statutorily conserved in the Kgalagadi Transfrontier Park.

In terms of the Northern Cape Conservation Plan, the study area falls in an area classified as “*Other Natural Area*” with the Gamagara River and floodplains which form part of an “*Ecological Support Area*” which will be crossed by the power lines. There are no officially protected areas, either provincially or nationally that occur close to the project site and no “*Important Bird Areas*” is located close to the project site. No National listed “Threatened ecosystem” occurs in close proximity of the project area.

VEGETATION UNITS

The following vegetation units were identified during the survey:

- Open *Vachellia haematoxylon* woodland on deep Aeolian sand;
- *Senegalia mellifera* thickets;
- Mixed *Vachellia haematoxylon* – *Grewia flava* – *Senegalia mellifera* low duneveld;
- Calcareous shrubveld associated with outcrop;
- Riparian woodland associated with Gamagara River

The **Open *Vachellia haematoxylon* woodland** is classified as having a medium sensitivity because of dense stands of protected trees and a license from DAFF is needed to remove the protected trees namely *Vachellia haematoxylon* and *Vachellia erioloba*.

The ***Senegalia mellifera* thickets / bushclumps** occurs in isolated pockets where the calcrete bedrock is closer to the surface, although still overlaid by kalahari sands. This vegetation unit is classified as having a medium-low sensitivity due to the encroachment and overgrazing observed in the area and no protected species are found in this unit.

The **Mixed *Vachellia haematoxylon* – *Grewia flava* – *Senegalia mellifera* low duneveld** is found in the areas to the west of Hotazel and to the east of the Gamagara River and is characterised by low duneveld. These areas form an undulating landscape with calcrete outcrops overlain by Aeolian sand (dunes). The vegetation unit is classified as having a medium sensitivity due to the protected tree species and flora and slightly undulating terrain associated with the dunes. A license from DAFF is needed to remove the protected trees namely *Vachellia haematoxylon* and *Vachellia erioloba* as well as the protected species *Harpagophytum procumbens*.

The **Calcareous shrubveld vegetation** unit is located to the east of the Gamagara River. The landscape is undulating calcrete outcrops with shallow Mispah soils. The vegetation unit is classified as having a medium-high sensitivity due to the shallow, rocky soils and steep slopes along the edge of the outcrop. The Ecological report states that from an Ecological point of view the development cannot be supported in the area considering that potential negative impacts could occur on the adjacent Gamagara River floodplain. This flaws the potential route to the Umtu substation from an ecological point of view.

The **Gamagara River channel and floodplain** adjacent to the Gamagara River is clearly identified as riparian woodland and grassland due to the plant species composition. The riparian zone still plays many essential roles in the functioning of the ecosystem, including Flow regulation, Water quality regulation, Habitat provision and Corridor functions. The area is classified as having a high sensitivity with protected species *Vachellia erioloba* and *Nerine laticoma*. As there is already a power line through this area it would be the best option to construct this new proposed power line next to the existing servitude. This would limit the impact on the area. There are also technological options available to ensure that pylons can be positioned outside the floodplain area only over spanning the floodplain, which would again mitigate the probable impact on the floodplain of the Gamagara River.

NO Red Data Plant species were identified on the study area

Two plant species that are classified as endemic or near-endemic were found in the study area. In the ecological report another 12 endemics are also listed in the Griqualand West Centre of Endemism and can occur there, but were not found in the power line study area.

The two protected **tree species** in terms of the National Forest Act (no.84 of 1998: National Forest Act, 1998) on the study area are *Vachellia erioloba* and *Vachellia haematoxylon*. Permits are needed to remove these trees. Two other **protected plants** in terms of the Northern Cape Nature Conservation Act (NCNCA), No. 9 of 2009 namely *Harpagophytum procumbens* and *Nerine laticoma* were also found in the study area. Permits are needed if these plants will be affected by the development.

Three Category 1b invader plants were identified namely *Argemone ochroleuca*, *Opuntia ficus-indica* & *Prosopis glandulosa*. These plants must be controlled through removal and destroying the plants.

Vegetation removal should be kept to a minimum during any future construction activities and only vegetation on the footprint areas should be removed. The unnecessary impact on the surrounding vegetation types and riverine ecosystems should be avoided as far as possible.

Considering the footprint area to form part of a widespread vegetation entity and slightly degraded state of the proposed development sites, the impact on the vegetation of the larger area would be medium. Mitigation measures and monitoring should therefore be implemented should the development be approved.

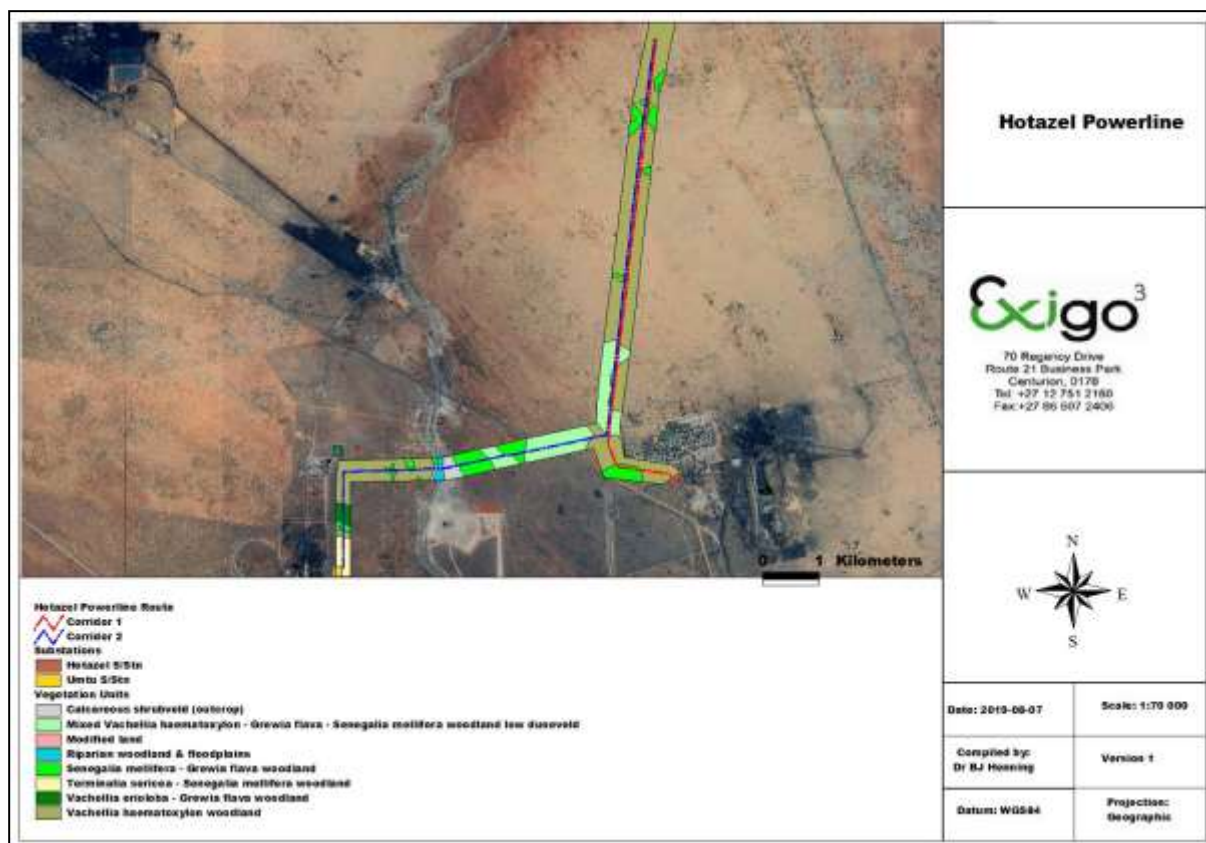


Figure 3. Vegetation Map of the proposed development

FAUNAL ASSESSMENT

MAMMALS

Large mammals that occurred historically at the site, are absent from the area, owing to anthropogenic impacts in recent centuries. Most of these animals today are confined to game reserves and national parks in South Africa and therefore will not occur naturally in the study area. This loss of large species means that the mammal diversity at the site is far from its original natural state not only in terms of species richness but also with regards to functional roles in the ecosystem. One larger predator of which the existence in the larger area could not be ruled out completely is brown hyena although tracks were not found during the surveys.

REPTILES AND AMPHIBIANS

Typical species associated with *arid and semi-arid habitat types* occur in the study area. Venomous species such as the puff adder, boomslang and cape cobra is expected to occur in the study area, although the presence of these snakes is dependent on the presence of their prey species (rodents, frogs etc.). The general habitat type for reptiles consists of shrubveld with limited available habitat for diurnally active and sit-and-wait predators, such as terrestrial skinks and other reptiles. The amphibians appear to be poorly represented on site and the seasonal pools in the drainage channel represent the most suitable habitat for the few amphibian species that could occur in the area. No threatened herpetofauna occur in the area.

RED DATA SPECIES

A list of Red data species that could potentially be found with their conservation status and probability of occurrence on the study area is supplied in table 15 of the Ecological report.

The impact of the proposed power line development on the red data and other mammal species will mostly have a medium probability as a result of the following:

- Large trees on site provide roosting places for large birds of prey
- Species with large home ranges (e.g. martial eagle) are not directly threatened by habitat loss
- The large size of certain large birds' home range make the probability of them occurring on the property low
- Some habitat like the pools and drainage channels will not be influenced.
- Larger mammals are already not part of the area any more.
- The herbaceous layer will be preserved below the power line servitude while adequate natural habitat/vegetation would be available on the peripheral habitats outside the study area
- Development also won't influence the natural feeding and movement patterns of the existing fauna in the area.
- Sufficient natural corridor sections should be protected around the proposed development footprints to allow fauna to move freely between the different vegetation units on the property. In this regard the surrounding shrubveld and woodland areas outside the footprint of the power line servitude will be more than sufficient as corridors.

WATER COURSES

One major Hydro-Geomorphic (HGM) unit was identified and represent water courses in the project area according to the National Wetland Classification System namely a Floodplain river with riparian woodland. No wetlands were identified on site. The major river channel of the Gamagara River is classified as a floodplain river channel with riparian woodland.

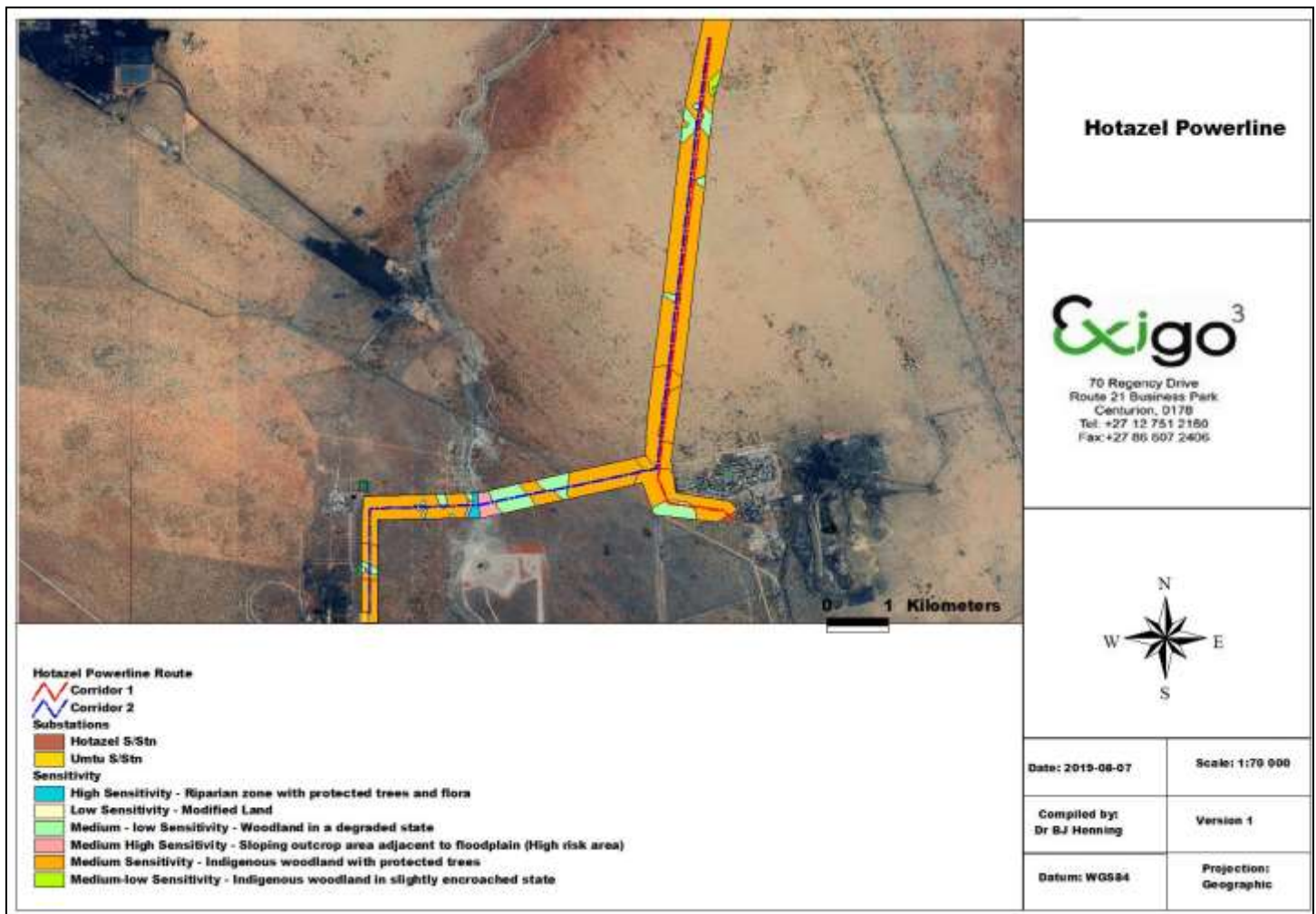
No vegetation grows in the channel itself other than the edges of the channel where sedges (Cyperaceae spp), aquatic plants (*Persicaria serrulata*, *Schoenoplectus corymbosus*) and hygrophilous grasses grow. In the case of the study area the floodplain adjacent to the Gamagara River is clearly identified as grassland due to the plant species composition. Typical woody species of the riparian zone next to the channel include *Vachellia karroo* and *Vachellia erioloba*. The grassland area on the floodplains is dominated by species such as *Panicum*

maximum and *Cenchrus ciliaris*, while the protected geophyte *Nerine laticoma* was also documented during the surveys.

The current layout plan of the proposed power line development will not impede on the floodplain river and buffer zone but the crossing of the river (west of Hotazel) would need strict mitigation to prevent negative impacts on the wetland. More detail is included in the Ecological and Riparian Report in Appendix D.

WATER COURSE INTEGRITY ASSESSMENT

The Gamagara River are classified as having a 'Moderately Modified' "Present Ecological State" (PES), due to the protected environment created by the dense riparian woodland along its banks, although the ecosystem is still impacted by erosion, sedimentation, alien species invasion and water pollution from upstream activities. This riverine system has a 'Moderate' "Ecological Importance and Sensitivity (EIS) and is considered to be ecologically important and sensitive on a regional scale. The biodiversity of these wetlands may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.



9.5.1 AVIFAUNAL ASSESSMENT

An avifaunal assessment for the Hotazel power line project was done by Tembele Ecological Services. Information used in this BA report are copied/deduced from the avifaunal report by Grosel (2019). A total of 127 bird species occur within the study area according to field surveys, from datasets for the pentads of the study area, and from other external datasets from other surveys from reputable sources. A total of 112 species are south African breeding birds while 7 are intra African breeding migrants and 8 are non-breeding palearctic migrants. At least 80 of the bird species is expected to breed in the Hotazel area based on suitable habitat and resources for the birds. Nine species are South African Endemic species. There are 12 specially protected bird species listed in the Northern Cape Nature Conservation Act which have been recorded in the Hotazel area and five Red Data listed species of which the Kori Bustard and the Lanner falcon can be considered regular visitors to the study area.

The major impacts that the development will have on the priority and more common species fall in the “medium” category, but after mitigation will drop down to “low” or “low to moderate” levels. The proposed project will be able to continue with virtually no or acceptable levels of impacts on the area’s avifauna if the recommendations in the Avifauna report are followed. Problems usually encountered at power lines are electrocutions by short circuits between the birds and live /earthed components, collisions of birds with transmission infrastructure (biggest single threat), and habitat destruction and disturbance. There will also be disturbance during the construction phase as a result of human and mechanical presence, noise and movement.

Bird electrocutions have a **Medium** significance dropping to **Low** after mitigation.

Electrocutions can be mitigated by using the **steel monopole design** for any new towers required for the proposed power lines fitted with bird guards and perch guards as well as installation of artificial perches and nesting platforms at a safe distance from energised components. Therefore the impact of electrocutions on this project is acceptable should the steel monopole be used.

Bird collisions have a **Medium** significance dropping to **Low/Medium** after mitigation. **Collisions** are certainly possible on the new power lines, but this can be mitigated by marking the entire line with **anti-collision bird flappers**. The exact spans requiring marking must be subject to an avifaunal walk down once the line has been surveyed and pegged. If this is done the impact of collisions is seen as acceptable for this project.

Habitat destruction has a **Low** significance with and without mitigation.

In terms of habitat destruction and displacement of birds through **bush clearing** for the proposed lines it is seen that as most of the routes will **follow existing servitudes**, road reserves and rail servitudes there will be **minimal bush clearing** and thus this impact should be negligible. It is strongly suggested that the construction of these relatively „small“ power lines be carried out in the winter season when most species are not breeding. Movement outside these construction areas especially into avian micro-habitats must be restricted (stay in development footprint).

9.5.2 SOILS, AGRICULTURAL AND LAND CAPABILITY ASSESSMENT

Table 2 Land types, geology and dominant soil types of the development area.

Hotazel Powerline Route

Corridor 1
Corridor 2

Substations

Hotazel S/Stn
Umtu S/Stn

Landtypes

Ae1
Af28
Ah5
Ah9

Exigo³
70 Regency Drive
Route 21 Business Park
Centurion, 0178
Tel: +27 12 751 2160
Fax: +27 86 607 2406

0 1 Kilometers

N
W E
S

Date: 2019-08-07 Scale: 1:70 000

Compiled by:
Dr B.J Henning Version 1

Datum: WGS84 Projection:
Geographic

Figure 5. Landtype Map of the project area

AGRICULTURAL POTENTIAL

The soils on the proposed development site are classified as class 3, which suggest that climatic conditions are conducive to rain-fed arable agriculture.

The classification of the site according to the agricultural potential classes indicates that the site falls within an area with a low potential for crop cultivation. From the databases of Department of Agriculture the site has the following land capability namely “Non-arable with a low potential for grazing”.

The soils were sampled and classified into broad classes according to the dominant soil form and family as follows:

- Shallow, calcareous soils of the Glenrosa or Mispah soil form;
Low Agricultural potential and moderate low grazing potential
- Medium depth red Aeolian sands of the Hutton / Clovelly soil forms
Low agricultural potential and moderate grazing potential
- Very deep red apedal Aeolian sandy soils of the Hutton soil form;
Low agricultural potential and suitable for grazing although a low nutrient content
- Alluvial soils of the Katspruit soil form associated with Gamagara River and floodplain.
Low agricultural potential and suitable for extensive grazing purposes.

The rainfall of between 120 and 260 mm per annum is one of the main factors for making the area unsuitable for arable agriculture. The potential grazing capacity of the land is between 9 and 13 ha /LSU. The proposed development of the power line will be adjacent to an already existing power line corridor would not entail a significant reduction of its grazing potential, therefore it will not have a negative impact on the land, being an economically viable unit if one considers that the remainder of the property can still support grazing. Considering that re-growth of grass will take place under the power lines the grazing value of the land will still be available to livestock.

9.5.3 SOCIO-ECONOMIC ASPECTS

The proposed solar parks in the area will assist the Eskom grid to meet the high energy demand related to the mining activities conducted in the area. Furthermore, being a renewable energy plant which doesn't generate greenhouse gases - it will assist to compensate the greenhouse gas emissions arising from these mining activities.

The local generation in the Hotazel area by means of new solar plants will help Eskom to meet the increase of the local supply demand without the urgent need of huge interventions on the network aimed to import the energy from other provinces / areas. Furthermore, the electricity tariff proposed by Eskom to the mines may be reduced wherever the energy is produced locally at a competitive price.

The 132 kV Power Line will form part of the Solar Park network distribution in the area. This project will contribute towards the national and local economies through civil contractor work, labour and building materials, which will be required on the projects site.

A share of approximately 40% of total CAPEX (investment costs) will be sourced from within the country. Raising of the capital to finance the installation of solar electricity generation facility represents a significant benefit for the South African economy. Approximately 50% of the operational costs will have a local economic return (mostly for staff remuneration and maintenance work by local sub-contractors), creating a positive economic impact for 25-30 years. This impact will be very beneficial for Joe Morolong Local Municipality, especially in view of the high unemployment rates and the need to develop an economic alternative for the mining sector. Staff remuneration, maintenance equipment and consumables are likely to be the primary operational expenses.

Additional benefits to the local municipality will be in the form of rates and taxes that will accrue to the local municipality as well as company tax that will accrue to the national government. The Solar Park project will furthermore have socio-economic benefits through:

1. job creation;
2. local content, increasing local manufacturing;
3. helping rural development and involving communities;
4. education and the development of skills for local people;
5. enterprise development through the promotion of and packages for new entrants; and
6. socio-economic development.

9.5.4 AIR QUALITY AND NOISE

The construction phase of the power line will entail large earthmoving equipment to clear and level the area for the construction of the power line. The environmental impacts of the construction of the power line in terms of air quality and noise for this development are small. There can be generation of dust, exhaust emissions and noise from the equipment and vehicles in the construction period.

9.5.5 HERITAGE RESOURCES

Exigo Sustainability (Pty) Ltd has done an Archaeological impact assessment on the Hotazel Power line route. The report by (Kruger, 2019) is used to extract information from and applicable portions are copied for clarity into this Basic Assessment Report and is included in Appendix F.

The proposed power line corridor follows the existing Eskom "Hotazel - Heuningvlei" 132 kV power line and the Eskom "Hotazel - Umtu" 132 kV power line respectively and as such, vast areas included in the site survey scope have been altered and disturbed as a result of the existing power lines. However, cognisance should nonetheless be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines and in pristine areas.

A low-density Middle Stone Age occurrence consisting out of single formal tools and scattered debris was documented along the banks of the Gamagara River along the proposed footprint area for the power line (**Site EXIGO-HZ280-SA01: S27.202998° E 22.921680°**). However, the site is of low scientific value and regarded as of minor magnitude due to the low lithic density and the general loss of context for the artefacts.

Even though the impact on the site by the proposed activity is anticipated to be peripheral and permanent, the significance of the impact on the resource is considered to be low and this impact can be limited to a negligible impact by the implementation of mitigation measures (monitoring) for the sites, if / when required. As such, a careful watching brief monitoring process is recommended for development activities. Should any previously undetected surface of subsurface paleontological or archaeological material be exposed during development activities, all activities should be suspended and the archaeological specialist should be notified immediately.

Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended, and the archaeological specialist should be notified immediately.

No burial sites were discovered in the project area. Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. Under no circumstances may burials be disturbed or remains removed until such time as necessary statutory procedures required for grave relocation have been met. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

Since heritage resources of low significance have been documented in the proposed Rhodes & East Powerline Consolidated Project footprint areas, no lasting impact on such resources is anticipated. No site-specific actions or any further heritage mitigation measures are recommended but the construction process should be monitored in order to avoid the destruction of previously undetected heritage remains. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed Energy Rhodes & East Powerline Consolidated Project may proceed from a culture resources management perspective.

9.5.6 CLIMATE

The study area is situated within the summer and autumn rainfall region with very dry winters and frequent frost that occurs during the colder winter months. The spatial and temporal distribution of rainfall is very complex and has great effects on the productivity, distribution and life forms of the major terrestrial biomes (Barbour et al. 1987). The mean annual precipitation varies between 120 and 260mm. The mean monthly maximum and minimum temperatures for the area are 41.5°C and -4°C, for December and July, respectively.

9.5.7 TOPOGRAPHY AND DRAINAGE AND LAND USE

Two major land facets are present on the site. **Dunes** occur as low-gradient hills to the east of the Gamagara River, while the remainder of the site represent **slightly undulating plains**. The topography across the site is slightly undulating with the average elevation of 1030 mamsl.

The site is located within the D41K quaternary catchment and is situated in the Lower Vaal Water Management Area. Drainage occurs as sheet-wash towards the major river namely the Gamagara River.

The current land-use along the proposed power line corridors is mainly grazing by livestock and game, although the area closer to Hotazel is vacant land. Neighbouring farms are being used for livestock grazing and game farming, with mining to the west of the proposed corridors.

The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant / unspecified land.

9.6 IMPACTS AND RISKS IDENTIFIED

The potential environmental impacts associated with the construction of the power line includes mainly the following:

- Potential impact on air quality
- Visual impact
- Potential impact on biodiversity
- Impact on soils (mainly in terms of soil erosion and agricultural potential)
- Potential impact on Surface water and groundwater
- Safety-impacts in terms of fire risks
- Socio-economic impacts.

Potential impacts identified include:

CONSTRUCTION PHASE:

- **Impacts on the road system and traffic;**
 - Extent: Surrounding and adjacent land
 - **Duration: Construction Phase (6-9 Months)**
 - Probability: Likely
 - Significance: Low (temporary impact)

- **Impacts on air quality and potential emissions;**
 - Extent: Locally and adjacent properties
 - Duration: Construction Phase (6-9 Months)
 - Probability: Likely
 - Significance: Low (temporary impact)

- **Noise impacts;**
 - Extent: Locally at the proposed site
 - Duration: Construction Phase (6-9 Months)
 - Probability: Likely
 - Significance: Low(temporary impact)

- **Geological, soil pollution and erosion impacts;**
 - Extent: Locally at the proposed site
 - Duration: Life of the project
 - Probability: Unlikely
 - Significance: Low

OPERATIONAL PHASE:

- **Visual impacts.**
 - Extent: Regionally at the proposed site
 - Duration: Life of the project
 - Probability: Definite
 - Significance: Low
- **Geological, soil pollution and erosion impacts;**
 - Extent: Locally at the proposed site
 - Duration: Life of the project
 - Probability: Unlikely
 - Significance: Low
- **Social impacts;**
 - Extent: Regional & Locally
 - Duration: Life of the project
 - Probability: High
 - Significance: High - Positive

9.6.1 DEGREE TO WHICH THE IMPACTS CAN BE REVERSED

- The **visual impact** is resident for a long time. It can be reversed if decommissioning and rehabilitation of the area takes place.
- **Impacts on soil** (erosion) can be reversed by rehab of the servitude of the power line.
- **Impacts on soil** (pollution) can be reversed by rehabilitation of soil on site.
- **Impacts on water** quality and quantity can be reversed by rehabilitation of impact.
- **The “fire” impact** can be reversed except when it caused bodily harm or even death
- **Socio-economic impacts** can be reversed if decommissioning takes place, though this will have a nett negative effect on the area.

9.6.2 DEGREE TO WHICH THE IMPACTS MAY CAUSE IRREPLACEABLE LOSS OF RESOURCES

There is no impact which can cause an irreplaceable loss of resources. Fire can cause the death of people –irreplaceable loss of life.

9.6.3 DEGREE TO WHICH THE IMPACTS CAN BE AVOIDED, MANAGED OR MITIGATED

It is not possible to completely avoid the impacts from the development on the environment. By following the mitigation and management measures detailed in the impact section in this report, most of the impacts and the effects it can have on the environment can be successfully lowered/mitigated to a lower degree of significance to the environment. This is to a point where the impacts are acceptable and where the benefits of the development are greater than the detriment to the environment.

9.7 METHODOLOGY USED IN RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL IMPACTS AND RISKS ASSOCIATED WITH THE ALTERNATIVES

To assess the impacts on the environment, the process will be divided into two main phases namely the Construction phase and the Operational phase. The activities, products and services present in these two phases will be studied to identify and predict all possible impacts.

In any process of identifying and recognising impacts, one must recognise that the determination of impact significance is inherently an anthropocentric concept. Duinker and Beanlands, (1986) in DEAT 2002. Thompson (1988), (1990) in DEAT 2002 stated that the significance of an impact is an expression of the cost or value of an impact to society.

However, the tendency is always towards a system of quantifying the significance of the impacts so that it is a true representation of the existing situation on site. This will be done by using where ever possible, legal and scientific standards which are applicable

The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The consequence matrix uses parameters like severity, duration and extent of impact as well as compliance to standards. Values of 1-5 are assigned to the parameters that are added and averaged to determine the overall consequence. The same process is followed with the likelihood that consists of two parameters namely frequency and probability. The overall consequence and the overall likelihood are then multiplied to give values ranging from 1 to 25. These values as shown in the following table are then used to rank the significance. It must be said however that in the end, a subjective judging of an impact can still be done, but the reasons for doing so must be qualified.

Significance ratings (Plomp 2004)

Significance	Low -	Low-Medium -	Medium -	Medium-High -	High -
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

Significance	Low +	Low-Medium +	Medium +	Medium-High +	High +
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

Description of the parameters used in the matrixes

Severity:

Low	Low cost/high potential to mitigate. Impacts easily reversible, non-harmful insignificant change/deterioration or disturbance to natural environments
Low-medium	Low cost to mitigate Small/ potentially harmful Moderate change/deterioration or disturbance to natural environment.
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change/ deterioration or disturbance to natural environment
Medium-high	High cost to mitigate. Possible to mitigate Great/Very Harmful Very significant change/deterioration or disturbance to natural environment
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely Harmful Disastrous change/deterioration or disturbance to natural environment

Duration:

Low	Up to one month
Low-medium	One month to three months
Medium	Three months to one year
Medium-high	One to ten years
High	Beyond ten years

Extent:

Low	Within footprint area
Low-medium	Whole of site
Medium	Adjacent properties
Medium-high	Communities around site area
High	Joe Morolong Local Municipality area

Frequency:

Low	Once/more a year or once/more during operation
Low-medium	Once/more in 6 months
Medium	Once/more a month
Medium-high	Once/more a week
High	Daily

Probability:

Low	Almost never/almost impossible
Low-medium	Very seldom/highly unlikely
Medium	Infrequent/unlikely/seldom
Medium-high	Often/Regularly/Likely/Possible
High	Daily/Highly likely/definitely

Compliance:

Low	Best Practise
Low-medium	Compliance
Medium	Non-compliance/conformance to policies etc. - internal
Medium-high	Non-compliance/conformance to legislation etc. - external
High	Directive, prosecution of closure or potential for non-renewal of licences or rights

9.8 ASSESSMENT CRITERIA

The terms of reference for the study include criteria for the description and assessment of environmental impacts. These criteria are drawn from the *Integrated Environmental Management Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts*, published by the DEA in terms of the Environmental Impact Assessment. These criteria include:

Table 3: Impact Assessment Criteria

Nature of impact This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what's being affected and how.		
Extent The physical and spatial size of the impact.	Site	The impact could affect the whole, or a measurable portion of the above-mentioned properties.
	Local	The impacted area extends only as far as the activity, e.g. a footprint.
	Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
Duration The lifetime of the impact; this is measured in the context of the lifetime of the base.	Short term	The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases.
	Medium term	The impact will last up to the end of the phases, where after it will be entirely negated.
	Long term	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter.
	Permanent	The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
Intensity	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
	Medium	The affected environment is altered, but function and process continue, albeit in a modified way.
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Probability The likelihood of impacts occurring. Impact may occur for any length of time during the life cycle of activity and not at any given time.	Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
	Probable	There is a possibility that the impact will occur to the extent that provisions must be made therefore.
	Highly probable	It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.
	Definite	The impact will take place regardless of prevention plans, and there can only be relied on mitigation actions or contingency plans to contain the effect.

Determination of significance.	No significance	The impact is not substantial and does not require any mitigation action.
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.		
	Low	The impact is of little importance, but may require limited mitigation.
	Medium	The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
	High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

The general approach to this study has been guided by the principles of Integrated Environmental Management (IEM). In accordance with the IEM Guidelines issued by the DEA, an open, approach, which encourages accountable decision-making, was adopted. The principles of the IEM require:

- informed decision-making;
- accountability for information on which decisions are made;
- a broad interpretation of the term “environment”;
- an open participatory approach in the planning of proposals;
- consultation with I&APs;
- due consideration of alternatives;
- an attempt to mitigate negative impacts and enhance positive impacts of proposals;
- an attempt to ensure that social costs of developments are outweighed by the social benefits;
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of proposals; and
- the opportunity for public and specialist input in the decision-making process.

9.9 POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY

- The positive impact that the development will have on the environment and community is a Socio-economic impact. It will create *temporary jobs* in the construction phase in an area with a severe shortage of employment. In this way it will help to alleviate poverty in the area.
- The power line will help to distribute power generated in a environmentally friendly way to the substations which can distribute it to the mines, businesses, industries and private people in the area. In this way it will reduce the carbon footprint of the delivered power to the area.
- It may have a slightly larger negative visual impact in the area as the existing power lines and the servitudes become larger and more visible
- It may have a larger footprint and impact on the biodiversity of the area.

9.10 POSSIBLE MITIGATION MEASURES AND RESIDUAL RISK

- As far as possible the development must stay within existing servitudes and cleared areas to limit the impact on sensitive environments.
- Do not clear any vegetation outside of the planned development footprint.
- Use monopole structures for the power lines and bird flappers as deterrents on lines to limit the impact on birds in the area.
- Position the pylons at the drainage line (outside drainage line if possible) such that the impact on the sensitive Gamagara River is minimised.
- Domestic waste during construction must be removed from the site on a regular basis not to impact on the soils or water bodies in the area.

9.11 MOTIVATION FOR NOT INVESTIGATING ALTERNATIVES

There is an existing power transmission line with a servitude on the development terrain. The servitude will have to be enlarged, but it makes sense that the new lines be constructed next to the old line and not in a different location to limit the impact on the environment

9.12 CONCLUDING STATEMENT INDICATING THE PREFERRED ALTERNATIVE AND LOCATION OF THE ACTIVITY

The preferred location alternative was selected based on the fact that it will be on an area currently used for an electrical transmission line. The location is suitable for the development. The positive effect of the socio-economic impact will have a positive effect on the environment that would offset the negative effects of the development.

9.13 DESCRIPTION OF THE PROPOSED PROCESS TO IDENTIFY AND RANK THE ENVIRONMENTAL IMPACTS THAT THE ACTIVITY, ASSOCIATED STRUCTURES AND INFRASTRUCTURE WILL IMPOSE ON THE PREFERRED LOCATION THROUGH THE LIFE OF THE ACTIVITY

An environmental impact is defined as a change in the environment, be it the physical/chemical, biological, cultural and or socio-economic environment. Any impact can be related to certain aspects of human activities in this environment and this impact can be either positive or negative. It could also affect the environment directly or indirectly and the effect of it can be cumulative.

9.14 DESCRIPTION OF ENVIRONMENTAL ISSUES AND RISKS IDENTIFIED DURING THE EIA PROCESS

The potential aspects to assess during the EIA process may include:

- Air quality and potential emissions aspects;
- Noise aspects;
- Biodiversity aspects
- Ground water aspects;
- Geology, soils and erosion;
- Visual aspects.
- Safety aspects

- Socio-economic aspects;

The following possible Key environmental impacts were identified:

ENVIRONMENTAL ISSUES	POSSIBLE CAUSE	POTENTIAL IMPACTS
Air Pollution and noise		
Dust	<ul style="list-style-type: none">Construction machines and vehicles during clearing and construction of the power line	<ul style="list-style-type: none">Health problemsAir pollutionPublic nuisance
Emissions	<ul style="list-style-type: none">During operation of construction equipment.During veld fires	
Noise	<ul style="list-style-type: none">Construction noise	
Water quality		
Pollution of water sources Pollution by <i>E.coli</i>	<ul style="list-style-type: none">Spillages of fuel & oil from vehicles during constructionPollution from solid general waste if not removed regularlyBy using insecticides and herbicidesPoorly planned and managed temporary sanitation facilities	<ul style="list-style-type: none">Pollution of surface and groundwaterHealth riskLower water qualitySoil degradationSiltation of aquatic system
Water quantity		
Impact on amount of water resources available	<ul style="list-style-type: none">Use of water during construction of the power line	<ul style="list-style-type: none">Loss of a scarce resourceIncreased pressure on water supply sourcesDrop of water table
Land/Soil degradation		
Soil contamination and degradation	<ul style="list-style-type: none">Spillages of oil, chemicals from machinery and vehicles during constructionSite clearing during constructionUse of Pesticides and FertilizersErosion on site	<ul style="list-style-type: none">Pollution of soilSoil degradationLoss of topsoilEffect soil characteristics, ecology & groundwaterLoss of topsoil
Biodiversity		
Decline in fauna and flora diversity	<ul style="list-style-type: none">Clearing of site for constructionLoss of habitat due to construction of power lineElectrocution/ collisions by/with Power lines	<ul style="list-style-type: none">Loss of biodiversityLoss of habitatNegative impact on biodiversityNegative impact on rare / endangered/ endemic species and habitatsBird mortalities

ENVIRONMENTAL ISSUES	POSSIBLE CAUSE	POTENTIAL IMPACTS
Cultural/Heritage		
Possible loss of heritage sites	<ul style="list-style-type: none"> • Damage during construction or operation 	<ul style="list-style-type: none"> • Possible loss of cultural heritage sites and graves
Visual impact		
Change in the visual characteristics of the site	<ul style="list-style-type: none"> • Clearing of vegetation for • Presence of power lines 	<ul style="list-style-type: none"> • Visual intrusion
Socio-economic impacts		
Job creation	<ul style="list-style-type: none"> • Increase in temporary and permanent work opportunities during the construction and operational phases. • Economic upliftment of the area. 	<ul style="list-style-type: none"> • Socio- economic benefit

9.15 DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING DURATION AND SIGNIFICANCE OF IMPACTS

The methodology used in ranking the nature, significance, consequences, extent, duration and probability of potential impacts and risks associated with the alternatives, is described and discussed in section 9.7 of this report and the assessment criteria is listed under section 9.8.

9.16 IMPACTS & MITIGATION MEASURES OF CONSTRUCTION & OPERATIONAL PHASES

All the possible impacts that can be predicted in both the construction and operational phases of the Hotazel power line are addressed. Specific mitigation measures are proposed and the significance of these impacts is described with and without the mitigation measures.

The mitigation measures described in the following paragraphs and in particular in the attached Environmental Management Plan will be the responsibility of the developer.

9.16.1 ATMOSPHERIC POLLUTION AND NOISE

Construction Phase

During this phase there will be a concentration of earthmoving equipment and construction vehicles that will clear vegetation within the power line servitude (66 m wide) for construction purposes and in the process will create dust and exhaust smoke that will impact on air quality. There will also be more noise created by the vehicles during this phase. Burning of waste and fires at the temporary construction sites may also create smoke.

Operational phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Therefore no impact on air quality is expected in this phase.

Project Phase	Impact :Atmospheric Pollution and noise								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Earthworks and Vegetation clearance	Air pollution:Dust	Low-medium	Medium-high	Low-medium	Medium-high	Medium-high	Low-medium	Medium
	Vehicle movement	Air pollution: Smoke	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	Low-Medium
	Vehicle movement	Air pollution : Dust	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low-medium	Medium
	Vehicle movement	Noise pollution	Low-medium	Medium-high	Low-medium	Medium-high	Medium-high	Low-medium	Medium
	Burning of cleared vegetation, solid waste & veld fires	Air pollution by excessive smoke	Low-medium	Medium-high	Low-medium	Medium	Medium	Low-medium	Medium
	Cooking fires of workers	Air pollution : Smoke	Low	Medium-high	Low-medium	Medium	Medium	Low	Low-Medium
Cumulative impacts	Pollution & Noise	Increase in release of smoke and increase in noise levels	Low	Medium-high	Low-medium	Medium	Medium	Low	Low-Medium

Mitigation measures - Construction Phase

- Vehicles must be well serviced so that it does not produce excessive smoke and noise.
- Refuelling shouldn't be allowed on the power line servitude.
- Vehicle maintenance shouldn't be allowed on the power line servitude.
- Speed of construction vehicles should be kept as low as possible to reduce the generation of dust and noise.
- Access road must be dampened to prevent excessive dust formation.
- The clearing of the power line servitude should be done in phases as the construction progresses.
- Construction should only take place during the hours between sunrise and sunset on weekdays and Saturdays.
- Contractors must comply with Provincial noise regulations. The construction machinery must be fitted with noise mufflers and be maintained properly.
- Vegetation cleared from the site and solid waste generated by the construction team (10 - 15 people) may not be burned on site or the surrounding areas, but be regularly removed to the municipal waste disposal site.
- The cleared vegetation can be stock-piled and should be removed to a licensed waste disposal site on a regular basis.

9.16.2 GROUNDWATER AND SURFACE WATER POLLUTION

Construction Phase

Spillage of fuel and lubricants from construction vehicles could occur. Storm water contamination by solid waste could lead to groundwater and surface water pollution.

In this phase the vegetation is removed and storm water over the area could cause erosion as well as siltation of watercourses. Road construction within the power line servitude (if required) will also increase the possibility of erosion and the siltation/sedimentation of surface water streams, because of increased storm water run-off.

Operational Phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Therefore no impact on groundwater is expected in this phase.

Project Phase	Impact: Groundwater and Surface water Pollution								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Spillage of fuel and lubricants from construction vehicles	Water Pollution	Medium	Medium-high	Low-medium	Medium-high	Medium-high	Low	Medium
	Clearing of vegetation	Erosion & siltation of streams	Low-medium	Medium-high	Low-medium	Medium	Medium-high	Low	Low-Medium

Project Phase	Impact: Groundwater and Surface water Pollution								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
	Solid waste disposal freshwater resources	Pollution of freshwater resources	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	Low-Medium
	Sanitation seepage from chemical toilets	Water Pollution	Medium	Medium	Low-medium	Medium	Low	Low	Low-medium
Cumulative impacts	Water pollution and increased water run-off	Increased potential for water pollution and increased water run-off	Low-Medium	High	Low-medium	Medium	Medium	Low-medium	Medium

Mitigation measures - construction phase

The following precautionary measures are recommended to prevent any surface or groundwater pollution:

- Clearance of vegetation must be restricted to the 66 m wide power line servitude and the grass layer should be preserved as much as possible.
- Construction activities must be restricted to the proposed power line servitude.
- Refuelling shouldn't be allowed on the power line servitude.
- Vehicle maintenance shouldn't be allowed on the power line servitude.
- Chemical sanitation facilities in the temporary construction sites should be regularly serviced by appropriate companies to ensure that no spills or leaks to surface and groundwater take place. Chemical toilets should not be placed within 100 m from any watercourse.
- Solid waste must be kept in adequate waste bins. Building rubble and various waste products should be removed on a regular basis to a licensed landfill site.
- If all possible water pollution is restricted and prevented, there would be no cumulative impacts as a result of the establishment of the Hotazel 132 kV Power Line.

9.16.3 WATER USE / WATER QUANTITY

Construction phase

During this phase, a small amount of water may be utilized for building of the foundations of the steel monopole structures. The water needed for the construction activities will be provided from the Sedibeng Water, the local water provider.

Operational phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Water use is not envisaged in this phase.

	Impact: Water use								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Construction process	Depletion of water resources: Water consumption	Low-medium	Medium	Medium	Medium	Low	Low	Low-Medium
Cumulative impacts	Water use	Increased pressure on local water resources	Low-medium	Medium	Medium	Medium	Low	Low	Low-Medium

Mitigation measures – Construction Phase

- Water must be used sparingly and it must be ensured that no water is wasted.
- Road along the power line servitude (if required) should be treated with chemicals to lower the use of water.
- Vehicle maintenance shouldn't be allowed on the power line servitude.
- An eradication and rehabilitation plan should be compiled for the exotic invasive plant species present on the power line servitude. An ecologist should be consulted to assist in this regard.

9.16.4 LAND AND SOILS

Planning phase

The crossing of the Gamagara Spruit should be designed in such a way to avoid the installation of structures inside the watercourse and related wetland area.

Construction phase

During construction, the vehicles used have the potential to spill diesel and lubricants that can pollute the soil. The storage of solid waste before it can be disposed of has the potential to pollute the soil and becomes a nuisance.

Operational phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Therefore no impact on land and soils is expected in this phase.

Project Phase	Impact: Land and soils								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Spilling of oil/diesel by construction machines	Contamination of soil	Medium	Medium-high	Low-medium	Medium-high	Medium-high	Low	Medium

Project Phase	Impact: Land and soils								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
	Solid waste disposal	Soil pollution + nuisance	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	Low-Medium
	Storm water over roads and cleared areas	Erosion	Low-medium	Medium-high	Low-medium	Medium	Medium-high	Low-	Low-Medium
	Wetland degradation due to construction activities within the buffer zone	Wetland degradation	Medium-High	Medium	Medium	Medium	Low-Medium	Low-Medium	Medium
Cumulative impacts	Increased potential for negative impacts on soil resource	Increased potential for erosion and soil pollution	Low-medium	High	Low-medium	Medium	Medium-high	Low	Medium

Mitigation measures - Construction Phase

- The crossing of the Gamagara Spruit should be designed in such a way to avoid the installation of structures inside the watercourse and related wetland area.
- Clearance of vegetation must be restricted to the 66 m wide power line servitude; the grass layer should be preserved as much as possible.
- The clearing of the power line servitude shouldn't entail removal of grass, except where the foundations are installed and along the access road. Bushes and trees should be trimmed to ensure that they don't interfere with the power line conductors.
- Construction activities must be restricted to the proposed power line servitude.
- Refuelling shouldn't be allowed on the power line servitude.
- Vehicle maintenance shouldn't be allowed on the power line servitude.
- Construction vehicles must be well maintained and serviced to minimise leaks and spills.
- Solid waste must be kept in containers and disposed of regularly at licensed dumping site.
- Any building rubble must be removed to a licensed disposal site on a regular basis during construction.
- The clearing of the power line servitude should be done in phases as the construction progresses.
- Slopes produced by removing soil must be kept to a minimum to reduce the chances of erosion damage to the area.

9.16.5 IMPACT OF THE DEVELOPMENT ON THE ECOLOGY (FAUNA & FLORA) OF THE AREA

Planning and construction phase

The removal of natural vegetation and destruction of habitat will have a negative effect on the biodiversity. The specific mitigation measures included in the Ecological and Avifauna Impact Assessment (Appendix D1 and D2) should be adhered to.

The crossing of the Gamagara Spruit should be designed in such a way to avoid the installation of structures inside the watercourse and related wetland area, as indicated in the Ecological and Riparian Study(Appendix D).

The following tree species occur in the area, namely ***Vachellia haematoxylon* (Grey camel thorn)** and ***Vachellia erioloba* (Camel thorn)**. A licence application should therefore be submitted to DAFF before any of these trees can be removed during construction.

Plant species are also protected according to the Northern Cape Nature Conservation Act (NCNCA), No. 9 of 2009. According to this Act, no person may pick, import, export, transport, possess, cultivate or trade in a specimen of a specially protected or protected plant species. The Appendices to the Act provide an extensive list of species that are protected, comprising a significant component of the flora expected to occur on site. Communication with Provincial authorities indicates that a permit is required for all these species, if they are expected to be affected by the proposed project.

The following protected plant species (geophytes) was found on site:

- ***Harpagophytum procumbens***
- ***Nerine laticoma***

Operational phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Only impact on avifauna are expected in this phase.

Environmental Aspect: Ecology (Fauna and Flora)									
Project Phase	Activity that causes impact	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Earthworks and vegetation clearance at construction site	Loss of indigenous plant species.	Medium	Medium	Low	Medium	Medium-High	Low-medium	Medium
	Earthworks and vegetation clearance at construction site	Disturbance to sensitive habitat.	Low	Medium	Low	Low-medium	Medium	Low	Low
	Vegetation clearance	The eradication and control of exotic invasive plant species Loss of indigenous plant species	Medium	Medium	Medium	Low-Medium	Medium-High	Low-Medium	Medium

Project Phase	Environmental Aspect: Ecology (Fauna and Flora)								
	Activity that causes impact	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
	The occurrence of veldt fires on site	Destruction of flora/habitats Loss of indigenous fauna	Low-Medium	Medium	Medium	Medium-High	Medium	Low	Medium
	Littering (e.g. cans and plastics) along access road and at construction site	Public nuisance and loss/death of indigenous fauna	Low-Medium	Medium	Medium	Medium-High	Medium	Low	Medium
	The control of animals on site Killing, poisoning or hunting of animals	Loss of indigenous fauna to the area	Medium-High	Medium	Medium	Medium	Low-Medium	Low-Medium	Medium
	Wetland degradation due to construction activities within the buffer zone	Wetland degradation	Medium-High	Medium	Medium	Medium	Low-Medium	Low-Medium	Medium
Operation	Birds colliding with power line	Death of birds	Medium-High	High	Low-Medium	Medium	Medium	Low-medium	Medium
	Birds perching or nesting on towers of power line	Electrocution of birds	Medium-High	High	Low-Medium	Low-Medium	Low	Low	Medium
Cumulative Impacts	Increased potential of negative impacts on ecology of the area	Increase in natural vegetation to be removed Electrocution of birds	Medium-High	High	Low-Medium	Low-Medium	Low	Low	Low-Medium

Mitigation measures – Construction phase

- The crossing of the Gamagara Spruit should be designed in such a way to avoid the installation of structures inside the watercourse and related wetland area.
- Clearance of vegetation should be restricted to the 66 m wide power line servitude; the grass layer should be preserved as much as possible.
- The clearing of the power line servitude shouldn't entail removal of grass, except where the foundations are installed and along the access road. Bushes and trees should be trimmed to ensure that they don't interfere with the power line conductors.
- Construction activities should be restricted to the proposed power line servitude.
- Refueling shouldn't be allowed on the power line servitude.
- Vehicle maintenance shouldn't be allowed on the power line servitude.
- Care must be taken that unnecessary clearance of vegetation does not take place. Where possible, natural vegetation must be retained.
- Protected trees and protected plant species can only be removed once the necessary permits have been obtained (DAFF and DENC).

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- The protected tree species ***Vachellia haematoxylon* (Grey camel thorn)** and ***Vachellia erioloba* (Camel thorn)** were found across the proposed power line corridors. No protected trees should be removed without authorisation from DAFF.
 - The project should comply with the *Northern Cape Nature Conservation Act* (Act No. 9 of 2009). According to this Act, no person may pick, import, export, transport, possess, cultivate or trade in a specimen of a specially protected or protected plant species. The Appendices to the Act provide an extensive list of species that are protected, comprising a significant component of the flora expected to occur on site. Communication with Provincial authorities indicates that a permit is required for all these species, if they are expected to be affected by the proposed project. The protected plant species ***Harpagophytum procumbens*** and ***Nerine laticoma*** were found across the proposed power line corridors. No protected plant species should be removed without authorisation from DENC and DAFF.
 - An eradication and rehabilitation plan should be compiled for the exotic invasive plant species present on the power line servitude. An ecologist should be consulted to assist in this regard.
 - Fires should not be allowed and extra care should be taken to prevent veldt fires of occurring.
 - The cleared vegetation should not be burned on site. The cleared vegetation should be stockpiled and taken to the closest available landfill site.
 - Solid waste must be kept in adequate animal proof waste bins at the temporary construction camp. Building rubble and various wastes should be removed on a regular basis to the closest available landfill site.
 - Regular clean-up programs should be put into effect along the access road and throughout the premises to limit the impact of littering caused by construction activities.
 - The stockpiled topsoil and construction material should be managed in such a way that the material is not transported by wind or rain. This can be done by restricting the height of the stockpiles, sandbagging and avoiding steep slopes.
 - No animals may be killed, captured or hunted on site by construction workers. Do not feed any wild animals on site.
 - Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and being trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches (if required) during construction process.
 - **Electrocutions** of birds can be mitigated by using the **steel monopole design** for any new towers required for the proposed power lines fitted with bird guards and perch guards as well as installation of artificial perches and nesting platforms at a safe distance from energised components.
 - **Collisions** of birds on the new power lines can be mitigated by marking the entire line with **anti-collision bird flappers**.
 - Cumulative impacts on the ecology of the area can be significant. However, with the mitigation measures in place, the potential is very low for significant negative impacts on the ecology of the area.
 - The EMPr will have to be adhered to both during the construction as well as operational phases and regular monitoring should be done to ensure that there is sound environmental practice at the East 132 kV Power Line.

Mitigation measures – Operational phase

- The high-risk sections of the power line should be marked with suitable anti-collision bird flappers on the earth wire as per the Eskom guidelines.

9.16.6 VISUAL IMPACTS

Planning and construction phase

The natural aesthetic character of the site will be changed. The the Eskom 132 kV power lines parallel to the planned power line corridors have already changed the visual characteristics of the site.

Ideally the project should be designed so as to occupy the smallest footprint on the ground, with the smallest vertical dimensions of suspension towers that are technically possible. The use of a monopole construction versus a lattice steel construction, for example, is more acceptable from a visual exposure perspective, due to its slim design and small footprint. From this perspective, possible visual impacts have already been mitigated by the use of a monopole construction for the project.

The visual absorption capacity of vegetation as a visual resource is largely effective. It is therefore recommended that during construction, the removal of vegetation is kept to the minimum. It is further recommended the conservation of identified individual trees or patches of bush and woodland at strategic locations, as an effort to apply best practice and manage existing visual resources.

Project Phase	Impact: Visual disturbance								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction and operation	Power line	Visual	Low	High	Low	High	High	Low-Medium	Low-Medium
Cumulative Impacts	Increased visibility of power lines	Visual	Low	High	Low	High	High	Low-Medium	Low-Medium

Mitigation measures – Construction phase

- Earth works should be executed in such a way that only the power line servitude is exposed. More importantly the indigenous vegetation should be retained.
- Cumulative impacts will be low as it was possible to mitigate the visual impact at Hotazel 132 kV Double Circuit successfully as a result of the natural characteristics of the area and because the power line corridors are parallel to **existing** Eskom 132 kV power lines.

9.16.1 ARCHAEOLOGICAL, CULTURAL AND SOCIAL FEATURES

Construction phase

A low-density Middle Stone Age occurrence consisting out of single formal tools and scattered debris was documented along the banks of the Gamagara River (Site AGES-HZ280-SA01: S 27.202998° E 22.921680°). Since heritage resources of low significance have been documented no lasting impact on such resources is anticipated. No site-specific actions or any further heritage mitigation measures are recommended but the construction process should be monitored in order to avoid the destruction of previously undetected heritage remains. The clearing of the power line corridor may have a negative impact on the archaeological features of the site. Care must be taken in the excavations and moving of soil to observe any archaeological feature of importance, which must be left and reported to the archaeological consultant for comments and actions.

Operational phase

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Therefore no impact on heritage sites is expected in this phase.

Project Phase	Impact: Loss of Archaeological, Cultural and social features								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Earth moving and soil clearance	Destroy archaeological evidence and heritage and graves	Low-medium	Medium-high	Low	Low	Low-medium	Low	Low-medium
Cumulative impacts	Activities on site during construction and operational	Increase in potential to unearth archaeological evidence and graves	Low-medium	High	Low	Low	Low-medium	Low	Low-medium

Mitigation measures – Construction and operational phases

Care must be taken during the construction process that anything of archaeological value that is unearthed must be recorded. Please refer to the Heritage Impact Assessment (Appendix F). The archaeologist or SAHRA must be notified whenever anything of importance is discovered.

9.16.2 SAFETY, SECURITY, FIRE AND HEALTH HAZARDS

Construction phase

Construction activities such as movement of construction vehicles and the use of equipment further increases the risk of injury.

Operational phase

Construction activities such as movement of construction vehicles and the use of equipment further increases the risk of injury.

Project phase	Impact: Safety, security and fire hazards								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Construction activities – erection of power line structures and cable installation	Loss of or injury to human life	Low-medium	Medium-high	Low	High	Medium	Low	Medium
	Security	Crime	Medium	Medium-high	Low-medium	Medium	Medium-high	Low - medium	Medium
	Fire hazards	Loss of human life and construction equipment etc.	High	Medium-high	Medium	Low	Low-Medium	Low-Medium	Medium

Mitigation measures-Construction phase

- The Contractor shall conform to the Occupational Health and Safety act (Act 85 of 1993) and regulations applicable. The Act requires the designation of a Health and Safety representative when more than 20 employees are employed.
- Access to the power line servitude should be monitored and allowed only to the workers of the construction team (10/15 people).
- No construction activities should be allowed during the night. Workers should not be allowed to stay on site during the night.
- Open trenches or excavations must be marked with danger tape.
- No solid waste or vegetation may be burnt on the premises or surrounding areas.
- Fire extinguishers must be available.
- Fires should not be allowed and extra care should be taken to prevent veldt fires from occurring.
- It must be ensured that the development complies with the requirements of the National Veld and Forest Fire Act, 1998 (Chapter 2: Fire Protection Associations and Chapter 4: Duty to Prepare and maintain firebreaks).
- Refuelling shouldn't be allowed on the power line servitude.
- Vehicle maintenance shouldn't be allowed on the power line servitude.

9.16.3 SOCIO-ECONOMIC IMPACT

Construction phase

The construction phase of the Hotazel 132 kV Power Lines will last 6 to 9 months and will involve a team of 10 to 15 workers.

The operation of the power line only requires periodical inspections in order to inspect the poles and to ensure that vegetation does not affect the cables. Therefore no socio-economic impacts are expected in this phase.

It should be noted that the Hotazel 132 kV Power Line will form part of the East Solar Park project. This project will contribute towards the national and local economies through civil contractor work, labour and building materials, which will be required on the project site.

Project phase	Impact: Job creation								
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Significance	
								With Mitigation	Without Mitigation
Construction	Job creation	Job Creation	Low +	Low +	Low +	Low +	High +	N/A	Low +
Cumulative impacts	Increased potential for job creation.	Increased potential for local Community development	Low +	Low +	Low +	Low +	High +	N/A	Low +

Mitigation measures

- Jobs must be created for unemployed local people and skills must be transferred to them.
- Where viable, the work must be executed in a labour intensive manner to create as many jobs possible.
- The cumulative impact of this impact will be positive. As one of the poorest provinces in South Africa, the Northern Cape is definitely in need of more job opportunities.

9.18 ASSESSMENT OF POTENTIALLY SIGNIFICANT IMPACTS AND RISKS

Impacts with a rating of Medium-high or High are impacts which are regarded as potentially significant, rated without any mitigation measures. In this impact assessment, the following impacts were regarded as potentially significant impacts. None of the impacts rated Medium-high or High.

9.18.1 CUMULATIVE IMPACTS

None of the impacts rated Medium-high or High.

9.18.2 NATURE OF IMPACT

None of the impacts rated Medium-high or High.

9.18.3 EXTENT AND DURATION OF IMPACT

None of the impacts rated Medium-high or High.

9.18.4 PROBABILITY OF OCCURRENCE

None of the impacts rated Medium-high or High.

9.18.5 DEGREE TO WHICH IMPACT CAN BE REVERSED

None of the impacts rated Medium-high or High.

9.18.6 DEGREE TO WHICH IMPACT CAN CAUSE IRREPLACEABLE LOSS OF RESOURCE

None of the impacts rated Medium-high or High.

9.18.7 DEGREE TO WHICH IMPACT CAN BE MITIGATED

None of the impacts rated Medium-high or High.

10 SUMMARY AND FINDINGS AND RECOMMENDATIONS OF SPECIALIST REPORTS AND HOW THESE FINDINGS HAVE BEEN INCLUDED IN THE FINAL ASSESSMENT REPORT

The main issues identified as a result of the specialist studies include the following:

Ecological and wetland assessment

- NO Red Data Plant species were identified on the study area
- The two protected **tree species** in terms of the National Forest Act (no.84 of 1998: National Forest Act, 1998) on the study area are *Vachellia erioloba* and *Vachellia haematoxylon*. Permits are needed to remove these trees. Two other **protected plants** in terms of the Northern Cape Nature Conservation Act (NCNCA), No. 9 of 2009 namely *Harpagophytum procumbens* and *Nerine laticoma* were also found in the study area. Permits are needed if these plants will be affected by the development.
- Three Category 1b invader plants were identified namely *Argemone ochroleuca*, *Opuntia ficus-indica* & *Prosopis glandulosa*. These plants must be controlled through removal and destroying the plants.
- The Gamagara River are classified as having a 'Moderately Modified' "Present Ecological State" (PES), due to the protected environment created by the dense riparian woodland along its banks, although the ecosystem is still impacted by erosion, sedimentation, alien species invasion and water pollution from upstream activities. This riverine system has a 'Moderate' "Ecological Importance and Sensitivity (EIS) and is considered to be ecologically important and sensitive on a regional scale.

Avifauna assessment

- There are 12 specially protected bird species listed in the Northern Cape Nature Conservation Act which have been recorded in the Hotazel study area and five Red Data listed species of which the Kori Bustard and the Lanner falcon can be considered regular visitors to the study area.
- **Bird electrocutions** have a **Medium** significance dropping to **Low** after mitigation.
- **Bird collisions** have a **Medium** significance dropping to **Low/Medium** after mitigation.
- **Habitat destruction** has a **Low** significance with and without mitigation.
- Through the findings of the Avifauna report and impact assessment it is concluded that the proposed project can proceed with acceptable levels of impact on avifauna if the recommendations in the Avifauna report are followed.

Agricultural Potential assessment

- The classification of the site according to the agricultural potential classes indicates that the site falls within an area with a low potential for crop cultivation. From the databases of Department of Agriculture the site has the following land capability namely "Non-arable with a low potential for grazing"
- The rainfall of between 120 and 260 mm per annum is one of the main factors for making the area unsuitable for arable agriculture. The potential grazing capacity of the land is between 9 and 13 ha /LSU.

Heritage assessment

- A low-density Middle Stone Age occurrence consisting out of single formal tools and scattered debris was documented along the banks of the Gamagara River along the proposed footprint area for the power line (Site **EXIGO-HZ280-SA01: S27.202998° E 22.921680°**). However, the site is of low scientific value and regarded as of minor magnitude due to the low lithic density and the general loss of context for the artefacts. Even though the impact on the site by the proposed activity is anticipated to be peripheral and permanent, the significance of the impact on the resource is considered to be low and this impact can be limited to a negligible impact by the implementation of mitigation measures (monitoring) for the sites, if / when required.
- ***In the opinion of the author of the Archaeological Impact Assessment Report, the proposed Powerline Consolidated Project may proceed from a culture resources management perspective.***

11 ENVIRONMENTAL IMPACT STATEMENT

11.1 SUMMARY OF KEY FINDINGS OF THE EIA

It can be concluded that there will be environmental impacts as a result of the proposed development of the Hotazel power lines. However, all the impacts can be mitigated to an acceptable extent. Most of the impacts can be avoided and potential impacted areas will be demarcated as no-go or limited areas, therefore limiting the possible negative environmental impacts.

11.2 SUMMARY OF POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

Positive impacts

Socio economic upliftment in the area. The development will bring needed jobs to the people of the communities of the development area. It will also provide a number of jobs in the construction phase for an area that has a high number of jobless people.

Electricity distribution will be more secure for the mines, industries and communities in the area of the power line.

Negative impacts

The development can have low-medium negative impacts on the air quality, water quality soil quality and safety of the area. The negative impacts of the development can however be mitigated effectively by application of the mitigation measures in this report and in the EMP.

Risks

The risks are the probable impact on the Gamagara River, impacts on protected fauna and flora, impacts on birds during the operational phase and impacts on heritage objects.

The largest risk is the risk of fires. If the project complies with the standards and regulations for the construction and maintenance of the power line during the operational period, the risks are decreased sufficiently and are acceptable.

12 ASPECTS WHICH WERE CONDITIONAL TO THE FINDINGS OF THE ASSESSMENT BY THE EAP OR SPECIALISTS WHICH ARE TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

- Pylons/towers must be positioned outside the floodplain area only over spanning the floodplain, which would again mitigate the probable impact on the floodplain of the Gamagara River.
- Permits are needed if any protected trees or other protected plants will be affected by the development and consequently have to be removed from the construction area.
- Invader plants identified in the Ecological report namely *Argemone ochroleuca*, *Opuntia ficus-indica* & *Prosopis glandulosa* must be controlled through removal and destroying the plants.
- Steel monopole design for any new towers required for the proposed power lines fitted with bird guards and perch guards as well as installation of artificial perches and nesting platforms at a safe distance from energised components must be used in the construction of the power line
- The entire power line must be marked with anti-collision bird flappers.
- Only vegetation inside the power line servitude may be removed for construction.
- Should any previously undetected surface of subsurface paleontological or archaeological material be exposed during development activities, all activities should be suspended and the archaeological specialist should be notified immediately.

13 ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

It is assumed that the developer will act responsibly towards the environment at all times during the development and will comply with the conditions of the authorization at all time.

14 REASONED OPINION FOR AUTHORISING OF ACTIVITY AND CONDITIONS INTERMS OF THE AUTHORISATION

It is the opinion of the EAP that the environmental impacts associated with the proposed development were identified and that the mitigation measures proposed to mitigate the negative impacts will decrease the environmental negative impacts to acceptable levels.

The EAP is of the opinion that the development can be authorized and respectfully request the competent authority to issue the authorization after careful consideration of all the information supplied in this Basic EIA report.

Conditions of the authorization

- Appoint an environmental control officer on site during construction of the development to monitor the development for compliance with the conditions of the environmental authorization.
- Drainage features – should be excluded from the development and be avoided
- Pylons/towers must be positioned outside the floodplain area only over spanning the floodplain, which would again mitigate the probable impact on the floodplain of the Gamagara River.

-
- Permits are needed if any protected trees or other protected plants will be affected by the development and consequently have to be removed from the construction area.
 - Invader plants identified in the Ecological report namely *Argemone ochroleuca*, *Opuntia ficus-indica* & *Prosopis glandulosa* must be controlled through removal and destroying the plants.
 - Steel monopole design for any new towers required for the proposed power lines fitted with bird guards and perch guards as well as installation of artificial perches and nesting platforms at a safe distance from energised components must be used in the construction of the power line
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 - Only vegetation inside the power line servitude may be removed for construction.
 - Should any previously undetected surface or subsurface paleontological or archaeological material be exposed during development activities, all activities should be suspended and the archaeological specialist should be notified immediately.

15 VALIDITY PERIOD OF REHABILITATION CONSTRUCTION EMPR

The period for which the construction EMPr must remain valid is for 5 Years from date of Environmental Authorisation.

16 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

I, EA Grobler, appointed EAP for the proposed application for Environmental Authorization for the dangerous goods storage areas at the new Hotazel Power line, hereby confirm:

- Correctness of the information provided in this report
- All comments and inputs and responses from stakeholders and I&APs are included here.
- All inputs and recommendations from the specialist reports where relevant, are included.

Signed:.....

Date: **November 2019**

17 BIBLIOGRAPHY

DEAT, 1998. *Guideline Document on the EIA Regulations implementation of sections 21, 22 and 26 of the Environment Act*, Government Printer, Pretoria.

DEAT, 1999. *Environmental Management Framework for the Northern Province*. University of Pretoria, Pretoria.

DEAT, 2002. *Impact Significance, Integrated Environmental Management, Information Series 5, Department of Environmental Affairs and Tourism*, Pretoria

DUIJKER, P.N. and BEANLANDS, G.E. 1986. The significance of environmental impacts: and exploration of the concept, *Journal of Environmental Management*, 10(1), 1-10 in DEAT, (2002).

MIDGLEY, D.C. PITMAN, W.V. AND MIDDLETON, B.J. 1994. First Edition *Surface water resources of South Africa 1990, Volume VI, Drainage regions U,V,W,X, Eastern Escarpment*. WRC Report No 298/6.2/94, Pretoria.

PLOMP, H. 2004. *A process for assessing and evaluating environmental management risk and significance in a gold mining company*. Conference Papers-Annual National Conference of the International Association for Impact Assessment: South African Affiliate.

THOMPSON, M.A., 1988. *The determination of Impact Significance in Environmental Impact Assessment*, Unpublished Master of Science Thesis, University of Manchester, UK.

THOMPSON, M.A., 1990. Determining Impact significance in EIA: a review of 24 methodologies, *Journal of Environmental Management*, 30, 235-250.