CaseID: 1672

ROCK ENVIRONMENTAL CONSULTING (PTY) LTD

P.O. Box 40541
Moreleta Park
0044
601 Rubenstein Drive
Moreleta Park
www.rockeco.co.za

THE PROPOSED SOLAR FARM FOR BESTWOOD ON THE REMAINDER OF THE FARM BESTWOOD 459-RD, KGALAGADI DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Draft ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DEA Ref No: 12/12/20/1906

Prepared for: PROVINCIAL MANAGER
SOUTH AFRICAN HERITAGE RESOURCES AGENCY
1 ROBB STREET
KIMBERLEY
8301

On behalf of: ANNES DE BRUYN / FRED CAWOOD
KATU PROPERTY DEVELOPERS (PTY) LTD
SUITE 36 PRIVATE BAG 2005
MENLYN RETAIL PARK
0063

Author: ROWAN VAN TONDER & PIETER VAN DER MERWE
ROCK ENVIRONMENTAL CONSULTING (PTY) LTD
P.O. BOX 40541
MORELETA PARK
0044

7 October 2011

Tel: +27 12 997 4742
Fax: +27 12 997 0415
Email: rockec@lantic.net
Reg no: 99/28567/07
Director: PN van der Merwe B Sc(Hon) B Sc (Hon) Environmental Management

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ENVIRONMENTAL ASSESSMENT PRACTITIONER

Name	Organization	Specialist assessment
Mr P. N. van der Merwe	Rock Environmental Consulting (Pty) Ltd	Public Participation, Scoping Report, EIA Report, EMP
Mr. R.C. van Tonder	Rock Environmental Consulting (Pty) Ltd	Public Participation, Scoping Report, EIA Report, EMP

ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE:

- EAP: P.N. van der Merwe (Director)
- Expertise: Environmental Impact Assessments in Land-use and Infrastructure Development.
- Years of experience: 19. Qualifications: B.Sc. Hons. Environmental Management PU for CHE.
- EAP: Rowan van Tonder
- Expertise: Currently involved with various applications for activities under the National Environmental Management Act (NEMA) (Act 107 of 1998), Mineral and Petroleum Recourses Development Act 2002 (Act No. 28 of 2002), and National Environmental Management: Waste Act, 2008 (Act 59 of 2008).
- Years of experience: 3. Qualifications: B.Sc. Hons. Physical Geography - Environmental Management at TUKS.

CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER:

Pieter van der Merwe / Rowan van Tonder
Rock Environmental Consulting (Pty) Ltd
PO Box 40541
MORELETA PARK
PRETORIA
0044

Tel +27 83 444 6272
Fax +27 12 997 0415
Email rock.rowan@lantic.net

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The proposed activity is situated on the Farm Bestwood 459 RD (Figure 1). The site itself covers part of the Farm on the north-western side of the Farm Bestwood. The farm is east (adjacent) of the Town Kathu and approximately 12 km North-east of the Sishen Mine. The Farm Bestwood falls within the Northern Cape Province and the Gamagara Municipality. Please refer also to the Topographical Locality Map in Appendix 1. Access to the site is indicated in figure one. It is at the turn-off to the town of Kathu on the N14. The underground cable from the solar farm for connection to the power line will follow the shortest route possible.

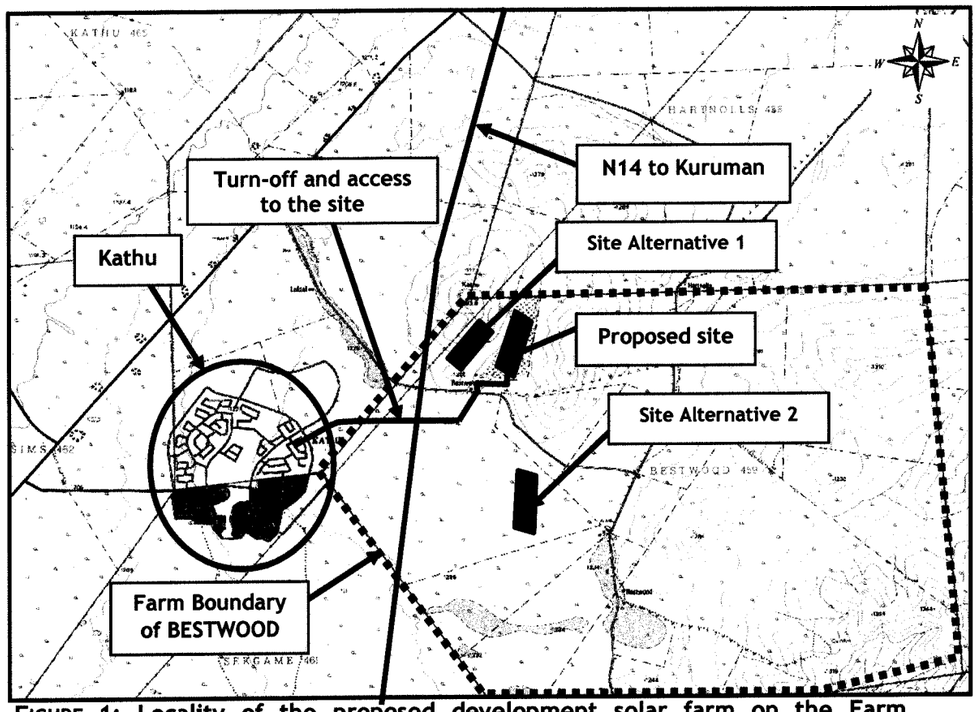


FIGURE 1: Locality of the proposed development solar farm on the Farm Bestwood 459 RD. (a larger copy of the above site plan is available in Appendix 1 and a layout plan will be available in Appendix 2 in the EIA).

A-2 LEGAL REQUIREMENTS APPLICABLE TO THIS APPLICATION

A-2.1 NEMA and Environmental Impact Assessment Regulations

- National Environmental Management Act (NEMA) (Act No. 107 of 27 November 1998), chapter 1 especially, which stipulates that Environmental Management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably. But equally important, that developments must be socially, environmentally and economically sustainable.
- DEAT Guidelines of June 2006 (Guideline 3 in particular, Section 4.3).
- Government Notice No. R. 385 of 21 April 2006, Regulations 27 - 36 (regarding Full Scoping and Environmental Impact Assessments) and Regulation 56 (regarding the public participation process).
- Government Notice No. R. 387 of 21 April 2006, Activity Number 1 (a):
    - 1: The construction of facilities or infrastructure including associated structures of infrastructure for:

      (a) the generation of electricity where -

      (ii) the elements of the facility cover a combined area in excess of 1 hectare;

- Government Notice No. R. 386 of 21 April 2006, Activity Number 1 (l), 12, 15 & 16:
    - 1 (l): the transmission and distribution of electricity above ground with a capacity of more than 33 kilovolts and less than 120 kilovolts;
    - 12: The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
    - 15: The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.
    - 16: The transformation of undeveloped, vacant or derelict land to -

(b) residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.

- Conservation of Agricultural Resources Act No. 43 of 1983 (Regulation 15, promulgated on 30 March 2001).
- National Heritage Resources Act (1999): To introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations; to lay down general principles for governing heritage resources management throughout the Republic; to introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa; to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level; to set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance; to control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries; to enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; to provide for the protection and management of conservation-worthy places and areas by local authorities; and to provide for matters connected therewith.
- National Environmental Management: Biodiversity Act (2004): Act no. 10 of 2004. Clearing of Vegetation
- Possibly the National Forestry Act (1998): Act no. 84 of 1998. There could potentially be the removal of protected plants.

A-3 DETAILS OF THE APPLICANT AND EAP

TABLE 1: The details of the project applicant.

Name of Applicant	Postal Address	Relevant Numbers
Kathu Property Developers Contact: Mr. Annes de Bruyn	Suite 36 Private Bag X 2005 Menlyn Retail Pretoria 0063	Tel: +27 82 376 9592 Fax: +27 12 460 5734 Email: annes@vvconsult.co.za

EAP and Expertise

- EAP: Rowan van Tonder
- Expertise: Currently involved with various applications for activities under the National Environmental Management Act (NEMA) (Act 107 of 1998), Mineral and Petroleum Recourses Development Act 2002 (Act No. 28 of 2002), and National Environmental Management: Waste Act, 2008 (Act 59 of 2008).
- Years of experience: 3. Qualifications: B.Sc. Hons. Physical Geography - Environmental Management at TUKS. **(FOR AN EXTENDED DETAILS, SEE APPENDIX 5 - EAP CV)**

A-4 MOTIVATION FOR THE PROJECT

The objective of this Scoping Report is to identify the issues that are associated with the proposed development, in terms of environmental, biophysical and socio-economic aspects, in order to present preliminary impact mitigation recommendations that are to be implemented during the design and especially during the construction and "operational" phases of the proposed development.

The Farm Bestwood encompasses 3 300 hectares of land. The proposed solar farm will only cover an area of approximately 20 hectares. (Preliminary Layout Plan, Appendix 2).

Power supply in South Africa is one of the country's major limitations inhibiting residential development in a market with an estimated demand of 600 000 housing units in the affordable home loan bracket.

In the iron ore and manganese rich areas of the Northern Cape Province around Kathu, Postmasburg, Hotazel and Kuruman, mines are experiencing a critical housing shortage for employees. Extensive expansion programs have been announced by all major mining houses like Kumba Iron Ore, Assmang Limited and Kalahari Manganese. This is mainly due to the announced short term double up of the Sishen-Saldana railway export capacity to be followed by doubling of the existing railway line. A number of smaller mines opened in recent times in the area, mining mainly manganese and transporting the ore by road to export harbours at Richards bay and Coega.

The Kathu town is strategically located in relation to these mining activities with a substantial increase in demand for available housing.

The Developer, Katu Property Developers (Pty) Ltd, plan to develop a fully integrated township in Kathu on the farm Bestwood covering an area of 200ha and includes residential, business, industrial and open space land use. The total residential stands amounts to 2 222 with further residential 3 stands offering approximately 3 000 housing opportunities in total. The original Kathu town has 1 900 residential stands. Over the past few years Kumba and Assmang developed an additional approximately 800 housing units in Kathu. The SDF of Kathu make provision for 23 000 stands which gives a potential future development of approximately 18 000 stands.

Gamagara Municipality has indicated through their Electrical Engineer Heyns van Rooyen that at present there is still spare capacity at the Kathu substation. This spare capacity is intended for existing and the Bestwood developments.

The available capacity at present is 20MVA and the maximum demand in July 2009 was 13.5MVA. The capacity available for new developments is therefore 6.5MVA. Gamagara has also entered into an agreement with Eskom for the supply and installation of an additional 20MVA transformer. Gamagara provided the necessary guarantee / payment to Eskom who should be able to complete this works within

the next 24 months upon which sufficient capacity would be available for the complete first phase development of 200ha on Bestwood.

To ensure a future secure power supply to housing development on Bestwood, the Developer thought it wise to make provision for own power generation through a solar power system. This solar farm will produce at capacity 12MVA.

Eskom, in a newspaper article in Sake 24 (Beeld) of 3 May 2010, announced that the Private Sector can on the short term supply 5 000 MW electricity to Eskom. The Minister of Energy, Me Dipuo Peters and Me Barbara Hogan, Minister of Public Enterprises formed a committee responsible to ensure that the private energy sector delivers 5 000 MW in Eskom's electricity network. This will greatly assist Eskom to overcome short term restrictions from now and the middle of the next decade. Analysts of the electricity supply in the country are mainly worried about power outages from early next year.

The Developer specifically chose to generate power through a solar system because of the advantages of Solar Power and the climate of the Northern Cape offering sunshine in abundance. The sun as energy source generating power supply, is completely renewable unlike other sources such as mineral oil, gas and coal. The estimated world resource availability of oil is approximately 42 years, gas approximately 65 years and coal 169 years while the sun will be available infinitely.

The advantages of solar power are impressive when compared to other sources of electrical power. With global warming and energy rates on the rise, solar offers THE affordable alternative.

Photovoltaics (PV), which will be used, is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material. Materials presently used for photovoltaics include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride, and copper indium gallium selenide/sulfide. Due to the growing demand for renewable energy sources, the manufacturing of solar cells and photovoltaic arrays has advanced considerably in recent years.

Solar photovoltaics is growing rapidly, albeit from a small base, to a total global capacity of 40,000 MW at the end of 2010. More than 100 countries use solar PV. Installations may be ground-mounted (and sometimes integrated with farming and grazing) or built into the roof or walls of a building (building-integrated photovoltaics).

Driven by advances in technology and increases in manufacturing scale and sophistication, the cost of photovoltaics has declined steadily since the first solar cells were manufactured.

1. IT'S RENEWABLE

The 89,000 TW of sunlight reaching the Earth's surface is plentiful - almost 6,000 times more than the 15 TW equivalent of average power consumed by humans. Additionally, solar electric generation has the highest power density (global mean of 170 W/m^2) among renewable energies.

Solar power is pollution-free during use. Production end-wastes and emissions are manageable using existing pollution controls. End-of-use recycling technologies are under development and policies are being produced that encourage recycling from producers.

PV installations can operate for many years with little maintenance or intervention after their initial set-up, so after the initial capital cost of building any solar power plant, operating costs are extremely low compared to existing power technologies.

As of 2011, the price of PV modules per MW has fallen by 60 % since the summer of 2008, according to Bloomberg New Energy Finance estimates, putting solar power for the first time on a competitive footing with the retail price of electricity in a number of sunny countries. There has been fierce competition in the supply chain, and further improvements in the levelised cost of energy for solar lie ahead, posing a growing threat to the dominance of fossil fuel generation sources in the next few years.

The biggest of the solar power advantages is that it's totally renewable. Although the sun's rays might be stronger is some areas due to latitude and daily cloud cover, and darkness prevails during the night-time hours, the sun is a constant

energy source that can never be depleted, no matter how much we use and rely on it. In direct contrast, fossil fuels are constantly dwindling in supply and thereby increasing in cost.

2. IT'S SAFE

Residential solar power is completely safe. It does not harm our environment or our health. Unlike the fossil fuels it does not leach harmful by-products into the air to contribute to the greenhouse gasses that cause global warming. Nor does it generate pollutants to harm the earth and its water supply.
Also, the collecting of solar energy isn't intrusive to the environment. Solar energy panels are the most intrusive part of solar power generation, yet they are well suited in most areas, or sitting on an open area of ground.

3. IT'S SELF CONTAINED

The system will be hooked up so households can be on the electrical grid during night-time hours or those times when more electricity is needed. Surplus electrical power will be sold and fed into the Eskom grid - our own self contained solar power plant.

4. IT'S ETHICAL INVESTING

The use of solar energy also helps our country's overall economy by decreasing our heavy dependence on expensive foreign oil, and the long term cost benefits to our planet cannot be overestimated.
The Developer chooses an ethical investment in green resources like solar power. And because solar power is totally green and friendly to the environment, its use is now encouraged by Government.

5. LOW/ NO MAINTENANCE

Solar Energy systems are virtually maintenance free and will last for decades. Once installed, there are no recurring costs. They operate silently, have no moving parts, do not release offensive smells and do not require you to add any fuel.

6. SOLAR ENERGY DISADVANTAGES

The initial cost is the main disadvantage of installing a solar energy system, largely because of the high cost of the semi-conducting materials used in building one. The cost of solar energy is also high compared to non-renewable utility-supplied electricity. As energy shortages are becoming more common, solar energy is becoming more price-competitive. Solar panels require quite a large area for installation to achieve a good level of efficiency. The efficiency of the system also relies on the location of the sun, although this problem can be overcome with the installation of certain components.

A-5 DESCRIPTION OF THE PROPOSED PROJECT

A-5.1 Location

The proposed activity is situated on the Farm Bestwood 459 RD (Figure 1). The site itself covers part of the Farm on the north-western side of the Farm Bestwood. The farm is east (adjacent) of the Town Kathu and approximately 12 km North-east of the Sishen Mine. The Farm Bestwood falls within the Northern Cape Province and the Gamagara Municipality. (Please refer also to the Topographical Locality Map in Appendix 1.)

Kathu, meaning "town under the trees", after the Camel Thorn forest it is situated in, is the iron ore capital of the Northern Cape Province.

Municipal status was allocated to the town of Kathu during July 1979. At present the municipal area consists of Kathu, Dingleton and Sesheng. Kathu is situated in the Kalahari Region of the Northern Cape - 47 km north of Postmasburg and approximately 45 km north east of Olifantshoek. The municipality originally consisted of 2 towns namely Sishen and Kathu. Yskor started developing the town of Sishen in 1953 - south of the mining area. In 1990 the name Sishen was changed to Dingleton. Development to the new town, Kathu, began in 1974 after proclamation was finalized in 1972.

Kathu Forest Natural Heritage Site:
In 1995, the Kathu Forest was proclaimed a Natural Heritage Site by the Department of Environment Affairs and included the Sishen Private Nature Reserve (Wildkamp), the farms Kathu, Sims, Hartnolls, Uitkoms, Kathu Town, Kathu Golf

Course and Kathu Pan (Laan *et al.* 1995). The Natural Heritage Site covers an area of approximately 4672 ha (Figure 8). The Kathu Forest has been included on the NACOR list as an area of conservation importance in 1978. Currently the conservation status of the Kathu Forest is being addressed by DWAF and according to the Government Gazette of 6 July 2007 (Notice 810 of 2007) an invitation to submit comments on the declaration of Kathu Forest as a 'Protected Woodland' under section 12(1) (C) of the National Forests Act, 1998 (Act No. 84 of 1998) as amended has been published.

A survey of the vegetation of Kathu Forest was done by Macdonald in 1976 and he classified the woodlands into three categories, i.e. the dense stands of *Acacia erioloba* form category 1 dense woodland, while the intermediate dense stands of woodland form category 2, and the open woodlands form category 3. However, the area covered by the NHS includes two other structural types i.e. open to dense bushveld (category 4) and shrubland/thicket (category 5). The main forest, category 1 woodland, is stands of tall *Acacia erioloba* trees occurring in dense patches on deep Kalahari sand. This category appears to be less than 200 ha in size and occurs mainly on the farm Uitkoms and the Sishen Private Nature Reserve (Wildkamp) (Macdonald 1976).

The major part of the Kathu Forest consists of Category 2 *Acacia erioloba* woodland and covers approximately 600 ha of the Farm Uitkoms 463. Other patches of this woodland flank both sides of Vlermuisleegte on the farm Uitkoms and in the northwest of the farm Bestwood 459 (Figure 8). This woodland also forms part of Kathu town and the golf course.

The largest part of the *Acacia erioloba,* category 3, open woodland and shrubland is a more open community with a well established grass sward (Macdonald 1976). The sandy soils are shallow with calcrete outcrops in some areas. The dominant plant species are *Acacia mellifera* and the grass *Enneapogon desvauxii.*

Threats to the Kathu Forest mentioned by Van Hoven & Guldemond (1993) and Laan *et al.* (1995) include:

- Overstocking;
- Water extraction from the Kathu aquifers;
- Disturbance by the road network; and
- Chemical control of *Acacia mellifera.*

The current expansion of Kathu town also poses a threat to the Kathu Forest and environs. However, if residential development is only allowed to the south-east, south and west of the town, the Kathu Forest will be safeguarded.

Ecosystem status is based on how much of an ecosystem's original area remains intact, relative to certain thresholds (Driver *et al.* 2004). According to Mucina & Rutherford (2006) and also according to the criteria used in determining the status of ecosystems (Driver *et al.* 2004), the Kathu Bushveld wherein the development is proposed is considered to be 'Least Threatened', therefore more than 80% of the natural habitat is still intact. Currently there is none of this vegetation type conserved in statutory conservation areas, except for the Kathu Forest which is conserved as a Natural Heritage Site, although it is intended to declare the Kathu Forest as a 'Protected Woodland' (NFA, 1998).

A-5.2 Alternatives Considered

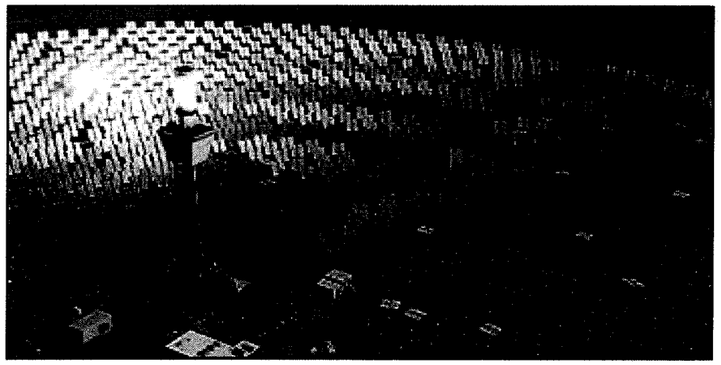
Gamagara has indicated that they do not have sufficient capacity to provide a supply to the Bestwood township development. An application has been submitted with ESKOM for a bulk supply to this development. There is a 400 kV/ 132 kV Eskom substation close to this site from which a bulk supply can be obtained if sufficient capacity exists. Currently electricity will be provided by the local municipality. The demand for the township will be 12 MVA NMD, but temporary 4.8 MVA NMD will be sufficient. All distribution lines will be able to carry 11 kV.

The alternative option for power supply to the Bestwood township development is an unsure venture and with the solar farm option (proposed) the Bestwood township development will be secure in terms of electricity and it will help Kathu in the process. The proposed option is also a cleaner (greener) way on the possible impacts on the surrounding environment.

Alternative technologies:

- Concentrated solar power (CSP) systems, are systems that use mirrors or lenses to concentrate a large area of sunlight, or solar thermal energy, onto a small area. Electrical power is produced when the concentrated light is converted to heat which drives a heat engine (usually a steam turbine) connected to an electrical power generator. This form of solar power plant needs a very large area.

The concentrated heat is then used as a heat source for a conventional power plant. A wide range of concentrating technologies exists; the most developed are the parabolic trough, the concentrating linear fresnel reflector, the Stirling dish and the solar power tower.



- Wind power is the conversion of wind energy into a useful form of energy, such as using wind turbines to make electricity. A wind farm is a group of wind turbines in the same location used for production of electric power. A large wind farm may consist of several hundred individual wind turbines, and cover an extended area of hundreds of square miles, but the land between the turbines may be used for agricultural or other purposes. This form of renewable energy farm needs a very large area and generates a lot of noise.

- Biomass, as a renewable energy source, is biological material from living, or recently living organisms. As an energy source, biomass can either be used directly, or converted into other energy products

such as biofuel. In the first sense, biomass is plant matter used to generate electricity with steam turbines & gasifiers or produce heat, usually by direct combustion. Examples include forest residues (such as dead trees, branches and tree stumps), yard clippings, wood chips and even municipal solid waste. In the second sense, biomass includes plant or animal matter that can be converted into fibers or other industrial chemicals, including biofuels. Industrial biomass can be grown from numerous types of plants, including miscanthus, switchgrass, hemp, corn, poplar, willow, sorghum, sugarcane, and a variety of tree species, ranging from eucalyptus to oil palm (palm oil). Using biomass as a fuel produces air pollution in the form of carbon monoxide, NOx (nitrogen oxides), VOCs (volatile organic compounds), particulates and other pollutants, in some cases at levels above those from traditional fuel sources such as coal or natural gas. Black carbon - a pollutant created by incomplete combustion of fossil fuels, biofuels, and biomass - is possibly the second largest contributor to global warming.

Alternative sites are also considered and can be seen in figure 1:

- The alternative site 1 is situated west of the proposed site, on the small ridge, which seem with preliminary investigation might be rendered too sensitive in terms of fauna, flora, cultural, historical or archaeological. The proposed site will be on the old agricultural fields situated in the valley just east of the ridge (see Figure 1 and layout plans in appendices).
- The alternative site 2 is situated south of the proposed site, east of the Bestwood residential development. This site would also be more preferred then alternative site 1, but will be in the way of future extentions from the Bestwood residential development. It is also in financial sense too far from the power line where it will connect into the grid of Kathu. The proposed site and the alternative site 1 is right next to the power line that will connect into the grid of Kathu.

SECTION B THE RECEIVING ENVIRONMENT

B-1 BIOPHYSICAL ENVIRONMENT

In order to determine the environmental impacts and identify possible issues associated with the proposed development, it is necessary to provide baseline environmental information. Following comprehensive site investigations and desk studies, as well as discussions with Interested and Affected Parties, the following section provides a description of the environmental conditions and important elements within the study area.

Strong emphasis was placed on the ecological assessment of floristic and faunal elements within the proposed area of development, such that sensitive elements that might adversely be affected by the proposed development could be highlighted. A general assessment of ecological elements does not require detailed floristic and faunal sampling. All studies will be included in this EIA report.

B-1.1 Climate

Rainfall data for the study area was obtained from the Sishen Weather Station (0356/857AX) over a period of 19 years (please refer to Figure 2 below for the graphical representation of the precipitation information).

The area is defined as summer and autumn rainfall when approximately 89% of the annual rainfall occurs. The area has very dry winters, when approximately 14mm (or approximately 4% of the total rainfall) of rain from July to August were recorded. This indicates an extreme variation in wet and dry cycles throughout the year. The Mean Annual Precipitation is approximately 220-380mm with frequent frost in the winter.

In terms of climate, the rainfall intensity is regarded as the most important element during construction phase, as it can potentially determine the risk of significant sheet and gulley erosion during the development stages. The rainfall intensity refers to the maximum precipitation recorded within a period of 24 hours. Within the study area, the highest rainfall intensity was measured in December (146 mm), which is at the beginning of the wet cycle. Other months with

moderately high rainfall intensities are February (118 mm) and March (113 mm). Therefore, construction during these months should ideally be avoided.

Further, in terms of climate, the scarcity of precipitation is regarded as the most important element during the operational phase, as each dwelling to be built on the site will need water. Over the period of 19 years, 8 months had minimum rainfall of 0mm.

Temperature data for the study area was obtained from the Sishen Weather Station (0356/857AX) over a period of 20 years (please refer to Figure 3 below for the graphical representation of the temperature information).

The climate is very hot in summer (with mean monthly maximum temperatures of 26.7°C) and very cold in winter (mean monthly minimum temperatures are 11.8°C). The highest mean daily maximum temperatures are 39.7°C in December and 40.0°C in January. On average, these are also the hottest months of the year. The lowest mean daily minimum temperatures were recorded for June (-5.7°C) and July (-6.9°C). The coldest months, on average, are from June to August, during which time frost may occur.

Cloud cover is at its highest between January and March, with a mean cloud cover of 50% or more.

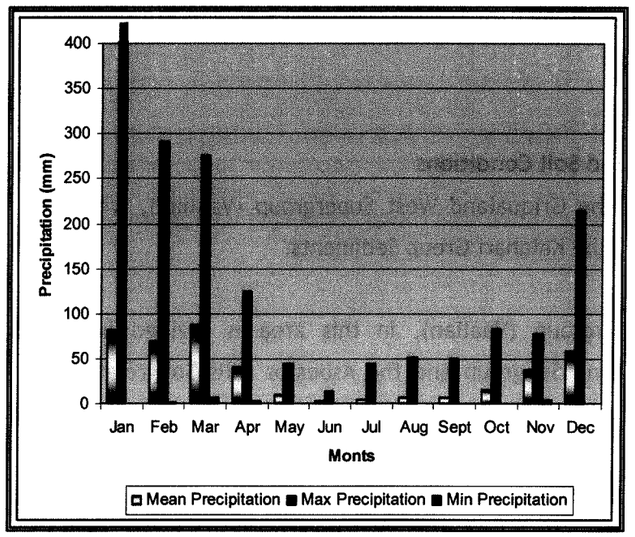


FIGURE 2: Rainfall graph for the Sishen Weather Station

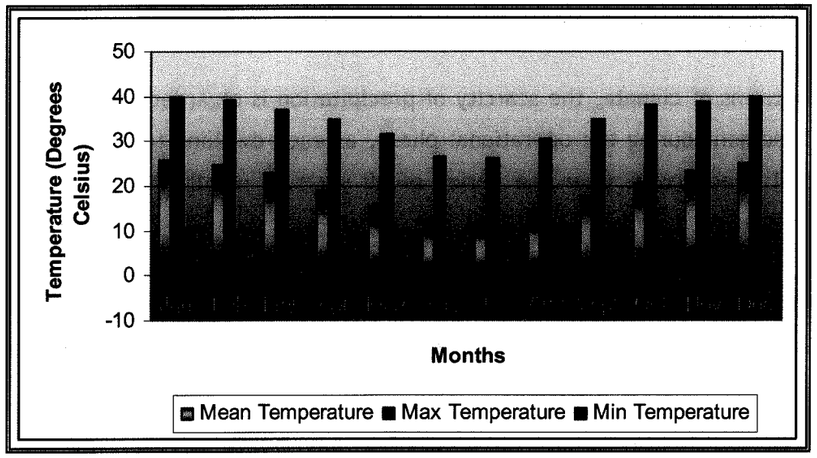


FIGURE 3: Temperature graph for the Sishen Weather Station

B-1.2 Topography, Surface Drainage and Geohydrology

The term topography refers to the "lay of the land". The topography of an area is determined by the geological history of that area. The topography of the study area is undulating. On site and east of the site are hills classified as Kuruman and Asbestos Hills, forming part of the Asbestos subgroup of the Griqualand West Supergroup (Vaalian).

There are no drainage lines on the site, but it is situated on a southeast facing slope. South southeast of the site is a depression that does gather water during rain events.

B-1.3 Geology, Land Types and Soil Conditions

The area is underlined by the Griqualand West Supergroup (Vaalian), with large areas containing deposits of the Kalahari Group Sediments.

The Griqualand West Supergroup (Vaalian), in this area is divided into two Subgroups, the Campbell Rand Subgroup and the Asbestos Hills Subgroup. These two Subgroups provide the sediment resources for the Iscor mines in the area.

The Campbell Rand Subgroup consists mainly of grey dolomite. It is over 2000m thick and contains the fossilized remains of some of the oldest life forms on earth.

Lead deposits occur in places, and economically important limestone lenses are found near the top.

The Asbestos Hills Subgroup follows concordantly upon the Campbell Rand Subgroup. Its lower part, the Kuruman Formation, consists mainly of banded iron formation which contains the crocidolite asbestos deposits of Griqualand West. The upper part (Danielskuil Formation) comprises banded brown jaspilite with minor riebeeckite, amphibolite and shale.

The characteristics which define a land type, namely terrain form, soil pattern and climate, strongly correlate with the topography and geology of the area. There are four different types of land types in the area and mostly south of the site.

The site itself are characterised by one of these four Land Types. The Ah land Type. This type is Red-yellow apedal (massive or single grained disturbing easily) soils (LP1) are freely drained and have a high base status (rich in Calcium). This Land Type further has usually a clay percentage of less than 15%, making it a very sandy soil.

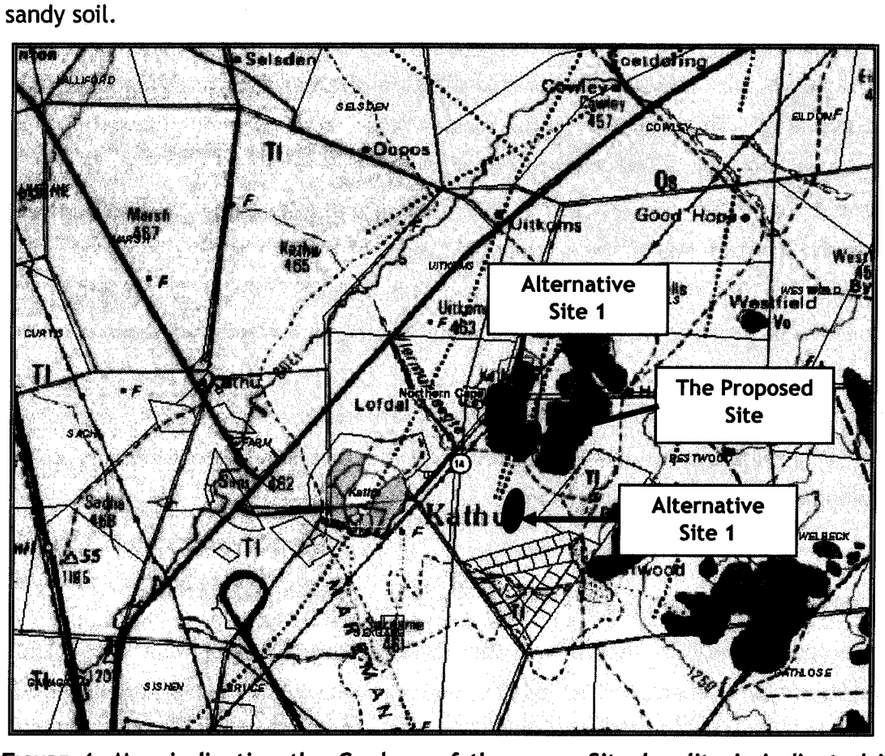


FIGURE 4: Map indicating the Geology of the area. Site locality is indicated in red.

The Land Type Ag, which is also Red-yellow freely drained apedal soils (LP2). These soils are further less than 300mm deep. These soils have a minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils.

Iin the area of the Kuruman Thornveld, occurs of the Ae Land Type. This type has also red-yellow apedal soils, freely drained, but is however deeper than 300mm. These three land types obtain their characteristics mostly from the Kalahari Group deposits.

The fourth Land Type (part of the site) covers the Kuruman and Asbestos Hills (Falling under the Kuruman Mountain Bushveld). This is the Ib Land Type, which is classified as miscellaneous, rocky areas with limited soils.

B-1.4 Agricultural Potential of the Study Area

The land potential, and specifically the agricultural potential of a site, is determined by the combination of climate, soil conditions and slope prevailing in that region or site, resulting in the classification of areas with similar agricultural land potential. These land potential classes range from "Very High Potential" to "Very Low Potential". The Department of Agriculture as mapped the agricultural potential of South Africa. Using this mapping (Agricultural Geo-Referenced Information System [AGIS]) files, it can be seen that the site as well as surrounding the site, the agricultural potential Low. This potential has only reference to grazing as the area has No potential for arable agriculture.

There is however, according to AGIS a temporary irrigation site west of the road, which runs adjacent to the western side of the site. This site is under urban development construction at present.

B-1.5 Flora of the Study Area

The proposed area is situated in the Kathu Bushveld Vegetation Type. This vegetation type is characterized by the medium-tall tree layer consisting mostly of *Acacia erioloba* (Camel Thorn). The vegetation types on site is then further chatagorized into the *Acacia erioloba* (Camel Thorn)-*Acacia mellifera* (Blackthorn) - *Tarchonanthus camphorates* (Camphor Bush) open to dense woodland, Acacia

erioloba - *Tarchonanthus camphorates* - *Eragrostis pallens* (Broom Grass) open woodland, and *Tarchonanthus camphorates* - *Acacia mellifera* shrubland. The Kuruman and Asbestos Hills are situated in the Kuruman Mountain Bushveld Vegetation Type. East of the site occurs the Kuruman Thornveld.

At this period in time, a Flora Specialist Study has already been done, however, the full Specialist study will be attached to this report (see Appendix 6). The information given below is a summary of the findings from the Specialist study.

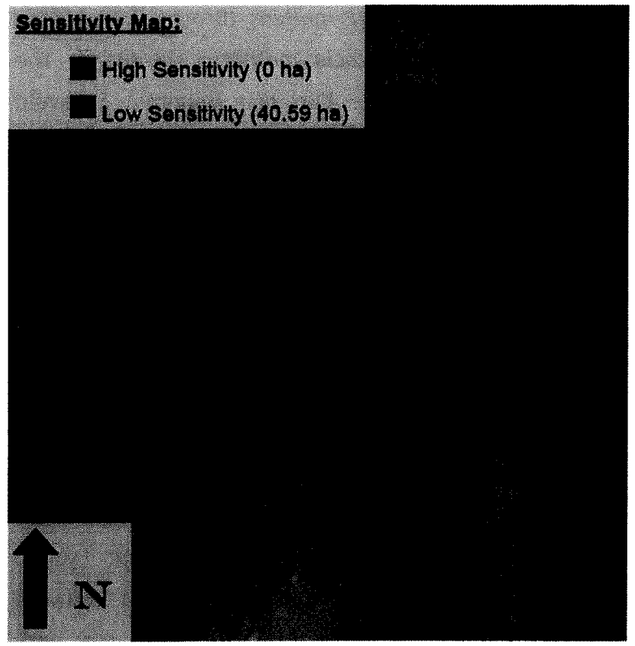
According to Mucina and Rutherford (2006) the area falls within two vegetation units viz. Kathu bushveld and Kuruman Mountain bushveld. The Kathu bushveld features a medium-tall tree layer with Acacia erioloba in places but mostly open and including Boscia albitrunca as the prominent trees. The shrub layer is generally most important with e.g. Acacia mellifera, Diospyros lycioides and Lycium hirsutum. The grass layer is variable in cover. The Kuruman Mountain bushveld features rolling hills with gentle to moderate slopes and hill pediment areas with an open shrubveld with Lebeckia macrantha prominent in places. The grass layer is well developed.

The different vegetation areas that were distinguished are as follows:

- Stipagrostis - Eragrostis grassland; and
- Tarchonanthus - Euclea shrubland.

Most of the study site comprised secondary grassland with a few sparsely scattered specimens of the protected tree Acacia erioloba (Camel thorn). The site was bordered on the east and west boundaries by the Tarchonanthus - Euclea shrubland, which also contained a few Acacia erioloba trees.

No recommendations are made with regard to exclusion of land, except that in terms of section 15(1) of the National Forests Act, 1998, the Acacia erioloba trees should be preserved in situ where possible.



B-1.6 Fauna of the Study Area

The site is relatively small. Only 11mammal, 30 birds and two reptile species were recorded. No Red Data Book Species was encountered.

B-1.6.1Mamalifauna:

According to available literature, approximately 64 mammal species occur in the Kathu Bushveld. The current composition for Kathu and immediate surrounds indicate a diversity of 38 mammal species. In the site itself only 11 mammal species were identified. This makes 29% of the total mammal species in the Kathu Bushveld.

No Red Data Book species was recorded.

TABLE 2: List of mammalifauna encountered on site:

Orycteropus afer	Aardvark
Sylivacapra grimmia	Common Duiker
Tatera leucogaster	Bushveld Gerbil
Lepus capensis	Cape Hare
Canis mesomelas	Black-backed Jackal

SCIENTIFIC NAME	COMMON NAME
Cryptomus hottentotus	African Mole-rat
Cynictis penicillata	Yellow Mongoose
Hystrix africaeaustralis	Cape Porcupine
Pedetes capensis	Springhare
Xerus inauris	South African Ground Squirrel
Raphicerus campestris	Steenbok

At this period in time, a Mammal Specialist Study has already been done, however, the full Specialist study will be attached to this report (see Appendix 6). The information given below is a summary of the findings from the Specialist study.

The mammal study found that the 40 ha location designated for the erection of the solar farm harbours very few small mammals; most are robust and widespread rodents such as four-striped field mice, multimammate mice, gerbils etc. The site does not harbour any Red Data species.

The proposed development will, over time, not displace any mammals. Thus from a mammal perspective, no objection can be offered against the proposed development.

B-1.6.2Avifauna:

According to available literature, approximately 204 bird species occur in the Kalahari Thornveld complex. The current composition for Kathu and immediate surrounds indicate a diversity of 164 bird species. In the site itself only 30 bird species were identified. This makes 18% of the total bird species of the Kathu biodiversity.

No Red Data Book species was recorded.

TABLE 3: List of avifauna encountered on site:

SCIENTIFIC NAME	COMMON NAME
Merops apiaster	European Bee-eater
Merops hirundineus	Swallow-tailed Bee-eater
Cuculus clamosus	Black Cuckoo

SCIENTIFIC NAME	COMMON NAME
Nilaus afer	Brubru
Emberiza flaviventris	Golden-breasted Bunting
Serinus atrogularis	Black-throated Canary
Serinus flaviventris	Yellow Canary
Cisticola aridulus	Desert Cisticola
Chrysococcyx caprius	Diderick Cuckoo
Streptopelia capicola	Cape Turtle Dove
Streptopelia senegalensis	Laughing Dove
Oena capensis	Namaqua Dove
Sporopipes squamifrons	Scaly-feathered Finch
Melierax gabar	Gabar Goshawk
Numida meleagris	Helmeted Guinea fowl
Upupa africana	African Hoopoe
Lophotis ruficrista	Red-crested Korhaan
Mirafra africanoides	Fawn-coloured Lark
Ploceus velatus	Southern Masked-weaver
Struthio camelus	Common Ostrich
Prinia flavicans	Black-chested Prinia
Rhinopomastus cyanomelas	Common Scimitarbill
Cerocotrichas paean	Kalahari Scrub-robin
Laniarius atrococcineus	Crimson-breasted Shrike
Plocepasser mahali	White-browed Sparrow-weaver
Lamprotornis nitens	Cape Glossy Starling
Hirundo rustica	Barn (European) Swallow
Psophocichla litsitsirupa	Ground Scraper Thrush
Parisoma subcaeruleum	Chestnut-vented Tit-babbler
Granatina granatina	Violet-eared Waxbill

At this period in time, a Avifauna Specialist Study has already been done, however, the full Specialist study will be attached to this report (see Appendix 6). The information given below is a summary of the findings from the Specialist study.

There is little information available on the impacts of solar farms on avifauna species within southern Africa.

The construction of the Bestwood Solar farm is ideally situated and will have minimal effect on Red Data bird species recorded for the 2723CA q.d.g.c., bird species that occur or that are likely to occur on the study site due to the following reasons.

- The solar farm is situated close to the town of Kathu, an area that has already been disturbed by past and present human activities and large-scale mining, which distracts any Red Data species from using the direct area on a regular basis. Most of these bird species are sensitive to human presence and areas disturbed by man.
- The construction of the solar farm will be situated in an area that has already been degraded by past human agricultural activities and should not disturb and degrade the natural vegetation surrounding it.
- The construction of the solar farm will take place in an area that is of low relevance for nature conservation and outside a protected or important bird area.
- The construction of the solar farm will take place far away from any drainage line or wetland.
- There are no large trees close to the study site where large raptors such as Martial Eagle and vultures (White-backed Vulture) breed.
- The study site is flanked by two mountains to the east and west of the study site which should result in bird species flying high over the solar farm.
- The proposed solar farm will be constructed outside any known sensitive or Red Data avifaunal migration route.
- The solar farm will be constructed outside any known water bird flight paths.

The proposed solar farm development should not have a negative effect on any Red Data avifauna if the above mitigation measures are fulfilled.

B-1.6.3 Herpetofauna:

According to available literature, approximately 40 reptile and 6 amphibian species occur in the Kalahari Thornveld complex. The current composition for Kathu and immediate surrounds indicate a diversity of 16 reptile and two amphibian species. In the site itself only 2 reptile species were identified. This makes for 13% of the total herpetofauna species of the Kathu biodiversity.

No Red Data Book species was recorded. And no amphibians were encountered on site.

TABLE 4: List of herpetofauna encountered on site:

SCIENTIFIC NAME	COMMON NAME
Agama agama aculeata	Ground Agama
Pedioplanis lineoocellata pulchella	Spotted Sand Lizard

At this period in time, a Herpetofauna Specialist Study has already been done, however, the full Specialist study will be attached to this report (see Appendix 6). The information given below is a summary of the findings from the Specialist study.

The herpetological study found that because this study site was ploughed in the past, whereby the indigenous vegetation and the herpetofauna were seriously disturbed, it is possible that the herpetofauna has not fully rehabilitated and thus has not achieved the original population levels. The study site appears to lie where a relatively low species diversity is expected, due to westwards-declining rainfall levels.

No species of special conservation concern appear to occur on the site or in the vicinity and the development of a solar farm will only affect relatively widely distributed amphibians and reptiles.

B-1.6.4 Sensitivity of the site:

Mitigation proposed is that:

- Where possible the *Acacia erioloba* trees should be preserved in situ, otherwise a permit for their removal must be obtained from the Department of Forestry. It these trees are preserved in situ, then a knowledgeable person should identify and mark the trees before construction operations start. A 25m wide buffer should be maintained around each tree and a fence should

be erected around each buffer area. Measures to ensure that these trees survive the physical disturbance from the construction should be implemented. A tree surgeon should be consulted in this regard.

- It is recommended that the Solar photovoltaic (PV) solar farm type be used since this will have the least impact on avifaunal species.
- The use of chemicals/pesticides should be avoided for the maintenance of vegetation and mowing or grazing should rather be used to limit vegetation growth.
- The vegetation under the solar panels should be kept short at all times to prevent fires and to prevent birds from breeding or nesting on the ground.
- The effects that the solar farm has on avifauna species should be constantly monitored and recorded in a database. The area within and surrounding a solar farm should be inspected on a daily basis. Any avifauna carcasses should be kept in fridges for identification purposes by a specialist and other research purposes in order to study the effect of the solar farm on the bird population in this region. Each individual solar farm should be analyzed on a case-by-case basis.

From an ecological perspective, 'clean energy' is much more preferable over traditional technology generating energy by burning fossil fuel. This statement is true even if fossil fuel is burned elsewhere and resultant energy is imported. It is also pointed out that photovoltaic solar plants are benign compared to other 'clean energy' technologies such as wind turbines which cause unacceptable mortalities to bats and birds.

This report furthermore stress the fact that the solar farm will be erected on a 40 ha portion of land which has been transformed into a field for raising crops. This site is presently fallow and in the initial phase of ecological succession, which is unlikely to ever attain the same ecological climax composition of surrounding climax ecologies.

It is thus deemed ecologically wise to erect benign 'clean energy' technology on a site that has already been transformed for another land-use practise.

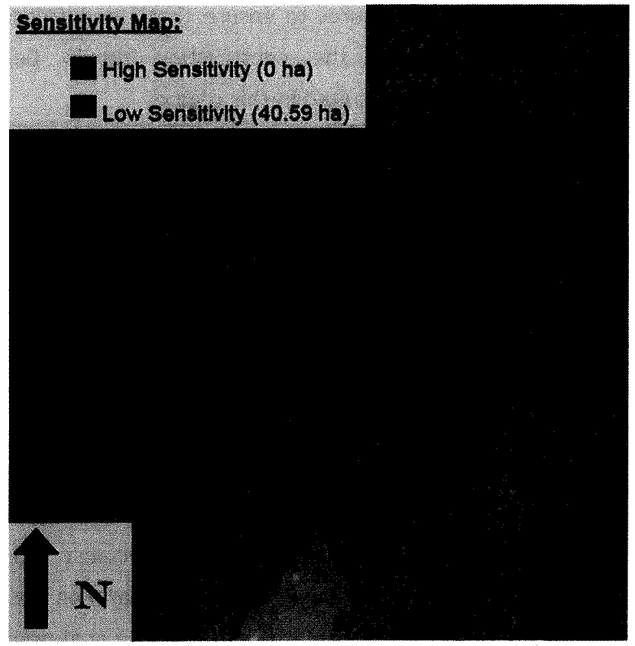


FIGURE 5: Sensitivity map.

No Red Data Species occurred on site during the Faunal Survey.

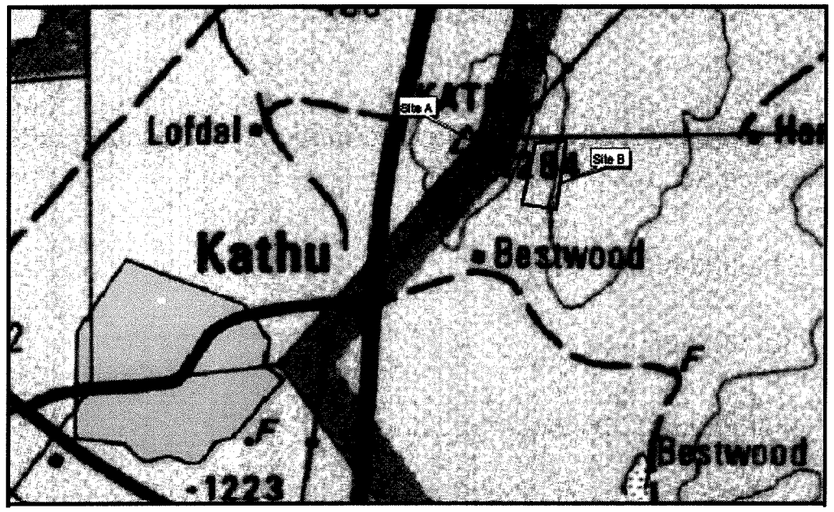
B-1.7 Elements of Culture Historical Importance

During the site investigations for the Scoping stage, focus was also placed on the presence of any stone built structure, ruins, grave sites, complete built structures and the presence of artefacts. Based on preliminary observations no such features occur within the proposed area of development. It is therefore not identified as an issue at this stage.

A Heritage Impact Assessment (HIA), as part of the Environmental Impact Assessment stage of the application process, was conducted in accordance with the National Heritage Resources Act (Act 25 of 1999) by Dr R. C. de Jong of Cultmatrix cc.

The aim of the full HIA investigation was to identify and assess, if any, heritage features and to recommend heritage management mitigation measures and monitoring programmes aimed at reducing the risks of adverse impacts. This input to be evaluated by SAHRA is included in the EIA stage. However, the Scoping report was made available to SAHRA for comments.

A summary of the HIA and Archaeological investigations follows: (For further information and recommendations please refer to Appendix 8)



The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop a solar power plant.

- A large Early Stone Age factory site was identified on the hill, on what is referred to as Alternative A (Site A). This site is seen to link with other sites in the vicinity, raising its significance to be high on a local level.

The proposed development would have a definite, high and permanent impact on the Stone Age site identified on Alternative A. It is therefore recommended that Alternative B (Site B) is used for the purpose of the proposed development.

Therefore, from a heritage point of view we recommend that the proposed development can continue on Alternative B. However, we request that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

B-1.8 The Socio-Economic Environment

The Bestwood Project would have a positive impact on the regional socio-economic structure through its support of the development industry, better local services support, job creation and the skills development of its employees and local community.

This fully **integrated development** offers the shareholders the opportunity to assist in local upliftment through the following:

- Involvement of local contractors,
- Job opportunities,
- Skills training and development,
- Social upliftment (see Appendix 9).

SECTION C ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

C-1 APPROACH TO THE EIA

An Environmental Impact Assessment (EIA) is a good planning tool. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way. The term "environment" is used in the broadest sense in an environmental impact assessment. It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

The EIA for this project complies with the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the NEMA EIA Regulations of the Department of Environmental Affairs and Tourism (DEAT). The guiding principles of an EIA are listed below.

C-2 GUIDING PRINCIPLES FOR AN EIA

- The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and transparency by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.
- There should be ongoing consultation with all interested and affected parties. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis.
- There should be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

C-3 EIA TECHNICAL PROCESS

An EIA typically has four phases, as illustrated in Figure 4 below.

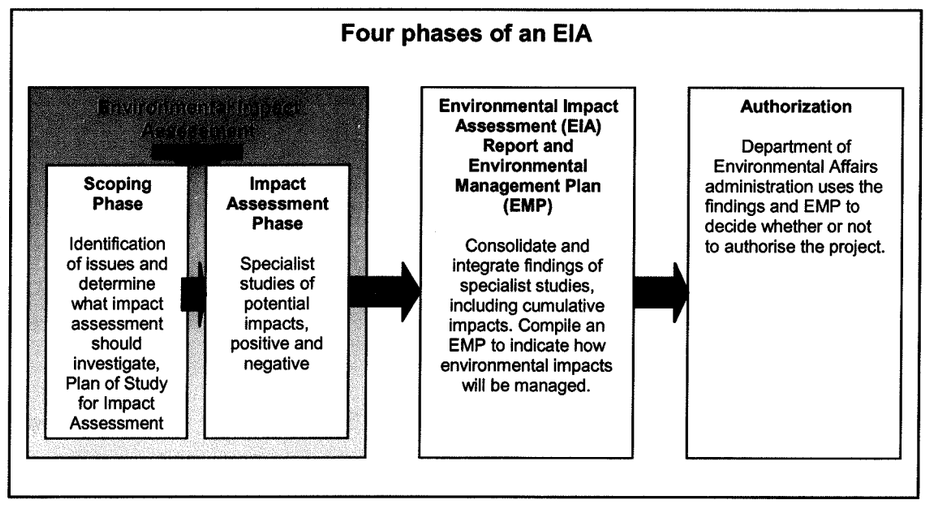


FIGURE 6: Phases of the EIA process.

C-3.1 Application for Authorization

An application for authorization, together with Rock Environmental Consulting's declaration of independence, was submitted to the Dept. of Environmental Affairs

on 11 June 2010. This resulted in the registration of the project with this Department and the allocation of the following reference number: 12/12/20/1906.

C-3.2 Information Gathering

Early in the EIA process, the technical specialists identified the information that would be required for the impact assessment and the relevant data were obtained. Additionally, the specialists sourced available information about the site and receiving environment from reliable sources, including Topographical Series Maps, Geological Series Maps, Interested and Affected Parties, previous documented studies in the area and previous EIA Reports, Sishen Weather Station, as well as several other sources that were utilised during the extensive desk studies conducted, including AGIS information. The EIA team and specialists then visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

C-3.3 Specialist Studies

The following specialist studies were identified as necessary requirements for the proposed activity and have already been undertaken. The information from these specialist studies has been incorporated into the EIA Report:

- Specialist Heritage Scoping Study
- Archaeological Survey
- Vegetation Survey
- Vertebrate Fauna Survey

C-4 PUBLIC PARTICIPATION PROCESS

The principles of NEMA govern many aspects of EIAs, including consultation with Interested and Affected Parties (I&APs). These principles include the provision of sufficient and transparent information to I&APs on an ongoing basis, in order to allow them to comment on the proposed activity.

C-4.1 Identification of Interested and Affected Parties

The following Interested and Affected Parties (I&APs) were identified and consulted during the Full Scoping Process:

- C Joachim - Municipal Manager of Gamagara Local Municipality;
- Mr L Botha - Technical Manager of Gamagara Local Municipality;
- Mr G van Dyk of DWAF;
- Mr A Olivier - Ward councillor; and

Thus far, the list of key identified I&AP's includes:

- September of the nearby Shell Garage;
- Mr J Smith of Reitz Hoewes; (Chairman of the landowners committee)
- Mr D Reitz (Reitz Landbou) of Reitz Hoewes;
- Mr J Markram - Adjacent landowner;
- Mr Engelbrecht - Adjacent landowner;
- Mrs S Markram - Reitzhof;
- Mr F Cawood - Landowner's son;
- Mr Fourie - Acacia works;
- Mr JD Ross - Adjacent landowner;
- Mr JL van Tonder - Adjacent landowner;
- Mr A Jacobs - Adjacent landowner;
- Mr GP van Zyl - Adjacent landowner;
- Mr G Theron - Adjacent landowner;
- Mr H Griffiths - Adjacent landowner; and
- Mr A Rautenbach - Adjacent landowner

(See Appendix 3E for more I&AP's).

C-4.2 Public Announcement of the Project

The project was announced as follows:

- Publication of a media advertisement in the local newspaper called the Kathu Gazette dated 15/05/2010 and 22/05/2010 (please see Appendix 6A).
- One site notice advertising the EIA was erected on site on 15/05/2010. The site notice was placed at the current access to the premises / farm.

- A Background Information Document (BID) was delivered (please refer to Appendix 3A for a copy of the BID) by hand to I&APs on 15/05/2010 (see Appendix 3B). The Background Information Documents (please refer to Appendix 6B for a copy of the BID) for the proposed Solar farm was either hand delivered, faxed or e-mailed to the surrounding land owners and other I&AP's in the study area on 15/05/2010, 19/05/2010 and 26/05/2010. BID's were also placed at the entrance to the Local Municipality Offices (see Appendix 3D). For Comment and Registration sheets received from I&APs, please see Appendix 3E.

C-4.3 Feedback from I&AP's

The closing date for registration and comment delivery from I&AP's during the first public participation phase was within 30 days from the date of publication of the last advertisement, which was the 20/05/2010. This period has lapsed, however, comments were still accepted long after this date and REC wil continue to do so throughout the duration of the project up to the final submission of the Environmental Impact Assessment Report. The challenge is to address comments and concerns to the best practical means and details available at that time.

The complete list of comments received from I&AP's can be viewed in Appendix 3H. The questions and comments received are addressed in Appendix 3H. Rock Environmental Consulting has ensured that copies of this Scoping Report is available to all I&AP's and Authorities for Comments.

C-4.4 Addressing the Comments and Questions Received from the I&AP's

Answers to questions and feedback to I&AP's comments' are provided in Appendix 3H (original comments on Registration and Comment Sheets, attached in Appendix 3E). Comments and questions that have not been fully addressed during

the scoping phase have been included in the Terms of Reference for the subsequent phase of the EIA process. The objective of the scoping process is mainly to identify the issues for addressing in the second phase of the EIA process. It is the opinion of the consultant that no issues were identified during the scoping process that could potentially constitute a fatal flaw in the development of the proposed solar farm.

C-4.5 Conclusions of the Public Participation Exercise

The proposed activity has raised no concerns or comments from the community at large. The EIA report will serve to clarify, consider and sustainably mitigate remaining and significant concerns that the participating I&AP's might have.

In conclusion, the public participation exercise has provided adequate information to enable an understanding of what the proposed development would entail and also to list and address the concerns and comments together with local information in the specialist reports compiled for this EIA Report. Through addressing all comments and questions received from the I&AP's, and through the compilation of a detailed Scoping Report for Comments, the consultant has attempted to promote a better understanding of the activities of the proposed development and to provide as much information concerning technical aspects of the development. Please refer to the comments and responses report in Appendix 3I.

In conclusion, it is regarded by the EAP that the EIA exercise undertaken for the proposed Solar Farm on the Farm BESTWOOD has satisfied the requirements for Public Participation Process.

SECTION D ASSESSMENT OF IMPACTS

D-1 IDENTIFICATION OF IMPORTANT ENVIRONMENTAL ISSUES

This section provides a list of the biophysical and social issues and impacts that can be expected as a result of the proposed development. Some of the issues are localised in their effects, whilst others are more generally applicable.

The identification and brief descriptions of the relevant physical and biological issues were conducted under the following headings in Table 5:

- Environmental aspects: defined as those actions on site that may potentially have an environmental impact;
- Environmental component to be impacted upon;
- Locality / applicable zone of the impact; and
- Nature and description of the impact.

Significant environmental issues have also been identified by means of the relevant environmental legislation, the opinions of specialist consultants and the views of interested and affected parties.

The interested and affected parties expressed no concerns regarding the proposed activity, up to date.

The description and identification of anticipated impacts is based on the listing of so called **environmental aspects**, which is the term used to describe the actions during the construction and operational stages of the project that may have a degree of impact on one or several of the environmental components listed. The list of environmental aspects that might be evaluated is practically infinite because *any* characteristic of the environment is an attribute. Therefore, it is necessary to reduce the number of aspects to be examined. Therefore, duplicative, redundant, difficult to measure, and obscure aspects may be eliminated in favour of those that are more definite.

An impact can be defined as *any change in the physical-chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities relative to alternatives under study for meeting a project need.* Therefore, the identified environmental aspects are said to have an impact on the components listed above. One of the most important aspects of conducting an Environmental Impact Assessment is to evaluate these aspects and impacts because there are proposed mitigation and management options for the identified impacts that must be provided within this EIA report, in the Section to follow.

The environmental aspect can be effective during the **construction phase (c)** and/or the **operational phase (o)**, which is the stage when the proposed solar farm on BESTWOOD 459-RD is complete and fully functional. The largest impacts resulting from the environmental aspects are anticipated during the construction

phase. Therefore, the mitigation measures that are implemented during the construction phase especially should serve to sufficiently alleviate the temporary, negative impacts caused by the construction activities.

A list of activities (environmental aspects) that will occur on site is indicated in Table 5 below and it provides an outline of the potential impacts that these actions will have on the environment (especially on the vegetation and soil surfaces of the site), as well as the anticipated effects on the visual character of the site, biophysical and also social aspects.

TABLE 5: List of activities (environmental aspects) that will occur on site, the potential impacts that these activities may have on the environment and a description of the nature of the impact.

ENVIRONMENTAL ASPECT AND PROJECT STAGE (i.e. construction phase or operational phase)	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / SPATIAL EXTENT OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/RISK
Vegetation clearance for the footprint/foundation of the solar plant (C).	Soil layers, soil surface, indigenous vegetation cover.	See the Conceptual Layout Plan (Appendix 2).	The removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in certain areas. The existing vegetation will be permanently removed to accommodate the footprint of the solar plant. Where the removal of surface vegetation is of a temporary nature only, the establishment of weeds is a threat. The topsoil layer is required to rehabilitate the unused areas (i.e. for re-vegetating the area).
Excavations for the foundations of the solar plant, as listed above (C)..,	Soil layers, vegetation and faunal habitats.	Development area, as indicated on the Conceptual Layout Plan in Appendix 2.	The existing vegetation will be permanently removed to accommodate the foundations of the necessary structures. The total extent of the excavations

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/ISSUE
			for foundations will be finalised during the EIA process to follow.
Vegetation clearance for the establishment of the access road to the site (C and O)	Soil surfaces, vegetation cover, aesthetic quality, surface water runoff and storm water drainage.	As indicated on the Conceptual Layout Plan in Appendix 2.	The removal of surface vegetation cover can lead to increased soil erosion, especially during the rainy season. Therefore, these areas will need to be surfaced as soon after vegetation stripping as possible. Incorrect design of access and internal roads can be problematic in terms of surface water runoff (can lead to erosion at outlet areas) and storm water drainage (damming and ponding of the surface water may occur). The access road will have a negative impact on the aesthetic quality of the site, in the form of above-ground scars across the landscape. Gravel roads will be implemented to the greatest extent possible.
Stockpiling of excavated material (C)	Soil and vegetation cover.	Precise location still to be determined; the impacts on soil and vegetation will occur wherever stockpiles are established. Wherever possible, the stockpiles should be placed in the Buffer Area, as described below or on already disturbed areas.	Stockpiles cause compaction of the soil, which promotes the establishment of weed species. The establishment of weeds greatly reduces the pristine quality of the natural vegetation on site. Stockpiles should not be situated within 200 m from any water bodies or water courses, as sedimentation transport into such systems is undesirable. Furthermore, stockpiles should not be situated in any sensitive

ENVIRONMENTAL ASPECT AND PROJECT STAGE (C) construction stage (O) operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT (HOW)
			environment described in the Flora Study.
Stockpiling building materials (C)	Soil and vegetation cover.	It is recommended that a 15 m width perimeter around the footprints of structures is established. This is called the "Buffer Area", in which stockpiling and vegetation modifications may occur.	Stockpiles will need to be established for the storage of aggregate, bricks and cement, etc. As mentioned, stockpiles cause compaction of the soil surface, which leads to the growth of unwanted weed species.
Provisions for storm water i.e. storm water drainage (C)	Soil surfaces, vegetation cover and drainage patterns.	Areas where surface water run-off is collected i.e. like from solar panels and hard surfaces (foundation), as well as road surfaces.	Correct and efficient storm water drainage systems must be installed. Poorly designed storm water outlets will result in increased surface run-off volume and speed, which could lead to the creation of erosion gullies. All road surfaces generate storm water, which should be controlled by preventing the storm water from crossing the road. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion.
Maintenance of storm water management systems (O)	Soil surfaces, drainage patterns and surface water.	In all areas where storm water management systems have been created.	Maintenance of storm water outlets is required to ensure that they don't get blocked (i.e. no longer fulfil their function) or result in erosion.

ENVIRONMENTAL ASPECT AND PROJECT STAGE (C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/ISSUE
Generation of construction waste (C)	Soil, vegetation, aesthetic quality of the site and surface water run-off, water and ground water resources.	All construction sites and directly adjacent areas within Residential Township Establishment.	Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. Further to littering the site and adjacent areas, poor control and illegal dumping of construction waste can pollute surface water run-off, as well as lead to the promulgation of weed species.
General structure maintenance (O)	Visual quality, also surface water quality and vegetation cover.	The study area at large.	The design and nature of solar plant will determine the impact of the proposed development on the visual quality of the study area. Maintenance of the solar plant as a whole will prevent a further negative impact on the visual quality of the study area. The disposal of construction rubble (both during construction and maintenance) causes impacts on the natural environment (including faunal ecology, surface water and vegetation) if disposed of illegally. Compaction of soil surfaces and the propagation of weeds are typical impacts.
Road maintenance (O)	Vegetation and soil surface conditions.	No specific locality. The access road to the development will need to be maintained.	Poorly maintained roads cause abnormal soil erosion. Therefore, road maintenance is essential to ensure an effective and usable road to the solar farm.
Collection and disposal of solid domestic waste (C)	Aesthetic quality, surface water run-off,	The site and directly adjacent areas.	Poor waste collection and handling will pollute the

ENVIRONMENTAL ASPECT AND PROJECT PHASE (C: construction phase O: operational phase)	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/ISSUE
	subsurface and groundwater quality, vegetation and fauna.		environment (affecting fauna, groundwater, surface water and aesthetic environment). No illegal dumping of domestic waste will be tolerated. Untidy collection points and windblown refuse can cause human / animal conflicts, as foul odours from such areas will attract wild animals and cause other problems (pests / diseases), as well as water pollution.
Collection and disposal of construction waste (C)	Aesthetic quality, subsurface and ground water quality, vegetation and fauna.	Any locality at which construction activities are to occur.	No construction waste may be illegally dumped into the surrounding areas, as the effects of illegal dumping on the environment are devastating. Poor waste collection and handling will have a negative impact on several environmental aspects. A waste collection agreement between the applicant and the local authority will be essential.
Temporary employment created during the construction phases of the proposed development(C)	Social aspects	All sites where construction related activities are to take place.	There will be positive impacts in terms of social upliftment and job creation within the broader region.
Long term employment opportunities and wealth to be generated by the proposed development (O)	Social aspects	Kathu and surrounding settlements.	There will be less positive impacts in terms of social upliftment and job creation within the broader region. Very little, if none, man power is needed during operation.
Transportation of workers to	Air quality, soil surface	The access road to the	Vehicles used to transport

ENVIRONMENTAL ASPECT AND PROJECT PHASE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/RISK
and from the development site (C)	and social aspects (including traffic and worker safety).	Development, and the N14 Road.	workers must never be overloaded; worker safety is of utmost importance. Vehicles used to transport workers must not exceed the speed limit and no vehicle may deviate from the existing routes on the Farm Bestwood, to ensure safety of the workers and conservation of the area. Poorly maintained vehicles will have a large negative impact on air quality.
Construction camp establishment (c)	Aesthetic impacts, social aspects, subsurface and groundwater quality, generation of domestic waste, vegetation removal, soil surface compaction and faunal impacts.	Location still to be determined.	The generation of domestic waste, as well as the provision of sewage facilities, within the construction camp could potential impact on the aesthetics of the site as well as the quality of subsurface and groundwater if not properly managed and implemented. The removal of sections of natural vegetation would most likely be needed for the establishment of the camp, and soil surfaces would become compacted as a result of activities within the camp.
Housing of workers during construction (C)	Aesthetic character, soil and vegetation, surface water quality and social aspects.	The possibility of housing construction workers on site.	The establishment of housing for workers will have a localised impact on the soil and vegetation cover of the chosen site, as well as potentially having a negative impact on the quality of surface water - as a result of domestic

[redacted]	[redacted]	[redacted]	[redacted]
			waste, and sanitation facilities for example, if these are not properly addressed. Living conditions must be adequately addressed to reduce potential impacts on human health.
Sanitation provision to workers during the working day (C)	Subsurface soil, surface water and subsurface water quality.	Sufficient chemical toilets should be provided for workers within walking distance of all construction activities.	Subsurface soil contamination and contamination of surface/subsurface water quality could occur if the ablution facilities provided are not according to standard. A temporary impact is possible; however, it can easily be prevented.
Movement of construction vehicles on site (C)	Air quality, soil and vegetation cover.	Potential impacts will be restricted predominantly to existing roads on the site.	Movement will cause limited or localised disturbances and temporary soil compaction, which promotes the establishment of weed species. Dust will be generated by vehicular movements on site.
Maintenance of construction vehicles (C)	Soil, vegetation and surface water.	Within the construction camp(s).	In the event of on-site repairs and servicing, soil surfaces, vegetation, and run-off may be locally contaminated. Spillage of fuel through faulty bowsers is a possibility, if not controlled. It is anticipated that no fuel storage facilities will occur on the site other than temporary storage of diesel in drums.
Traffic safety on the main road (C and O)	Social aspects.	The N14 to Kathu.	The access point to the site is via this National Road; therefore motorists using the main road

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE POTENTIAL IMPACT/ISSUE
			may be negatively impacted on by slow moving construction vehicles.
Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers (C)	Impacts on faunal species and surrounding land owners.	Areas on and surrounding site at which construction activities take place.	Excessive noise levels on site may negatively impact upon the behaviour and movements of site fauna. The significance rating and mitigation of this potential impact will need to be dealt with effectively in the EIA report. Surrounding land owners may also potentially be negatively impacted upon by excessive noise levels on site during construction.

D-1.1 Cumulative Impacts

According to the definition in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. No high significantly potential cumulative impacts are identified.

Cumulative impact on other physical components such as natural vegetation and animal life, air quality and visual impact is not regarded at this stage as of high significance, due to the out stretched and spacious nature of the landscape.

The only possible cumulative impact foreseen could be the addition of the nearby quarry. The quarry on its own has high significant impacts. If the solar farm is added to it will most likely not add any additional impacts to the quarry. These two activities should be kept separate/isolated from each other. All impacts from the construction phase of the solar farms should be continually mitigated.

D-2 ASSESSMENT METHODOLOGY

There are numerous assessment methodologies and approaches within the international sphere of assessing the potential impact of development activities on the environment.

When a particular method for environmental impact analysis is selected or used certain general principles must be kept in mind to avoid the mystique and pseudo-science, which cloud many planning procedures. In general terms an environmental assessment evaluation comprises four main tasks:

1. Collection of data;
2. Analysis and interpretation of this data;
3. Identification of significant environmental impacts;
4. Communication of the findings.

Further to the above the proposed mitigation and management options for the identified impacts must be provided. The selected impact evaluation method must enable these four tasks. Impact methodologies provide an organised approach for predicting and assessing these impacts. Any one methodology and approach will have opportunities and constraints, as well as resource and skill demands, and no one method is appropriate for all South African circumstances. The selected methodologies proposed by this document are appropriate for most South African situations, taking the above criteria into account. Methods whose approach to considering environmental factors is systematic are desirable in an EIA.

Impact assessment methodology should comply with the following set of criteria:

a. *Be comprehensive:* The environment consists of intricate systems of biotic and abiotic factors, bound together by complex relationships. The methodology must consider the impact on these factors.
b. *Be flexible:* Flexibility must be contained in the methodology, as projects of different size and scale result in different types of impacts.
c. *Detect true impact:* The actual impact that institutes environmental change, as opposed to natural existing conditional changes. Long-term and short-term changes should be quantified.
d. *Be objective:* The methodology must be objective and unbiased, without interference from external decision-making.

e. *Ensure input of required expertise:* Sound, professional judgement must be assured by a methodology.

f. *Utilize the state of the art:* Draw upon the best available analytical techniques.

g. *Employ explicitly defined criteria:* Evaluation criteria used to assess the magnitude of environmental impacts should not be arbitrarily assigned. The methodology should provide explicitly defined criteria and explicitly stated procedures regarding the use of these criteria, including the documented rational.

h. *Assess actual magnitude of impacts:* A method must be provided for an assessment based on specific levels of impact for each environmental concern.

i. *Provide for overall assessment of total impact:* Aggregation of multiple individual impacts is necessary to provide an evaluation of overall total environmental impact.

j. *Pinpoint critical impacts:* The methodology must identify and emphasize particularly hazardous impacts.

The evaluation of the severity (or significance) of the identified impacts has been done according to a set and objective Significance Rating Methodology, which uses both **quantitative** and **subjective** measures. The framework of this methodology is included as Appendix 4B, which fully explains the rating procedure used and how the construction and operation values given in Table 6 below were derived.

The identified impacts are rated in terms of their significance during the construction phase and the operational phase of the proposed Residential Township. The identified impacts on the physical, ecological and social components of the site are discussed in terms of:

- Vegetation component of the site;
- Faunal component of the site;
- Impact on Red Data Fauna and Flora;
- Soil surface (stability);
- Topsoil layer (disturbance and compaction);
- Subsurface soil quality;
- Topography;
- Geology;

- Surface drainage and existing water bodies (streams within the study area);
- Surface water run-off (quality);
- Groundwater resources (quality);
- Air quality (due to dust generation);
- Ambient noise levels;
- Cultural historical elements;
- Social environment (of adjacent landowners);
- Traffic safety aspects (safety of the community);
- Land use options and agricultural potential of the site;
- Visual and aesthetic quality;
- Local economy (due to job creation); and
- Impact on the community (due to provision of affordable electricity).

D-3 IMPACT ASSESSMENT

It should be noted that the impact significance rating is given presuming that **no mitigation measures** are to be implemented during the construction or operational phase of the project (this would imply a worst case scenario).

TABLE 6: Significance rating of the anticipated impacts.

ENVIRONMENTAL AND OTHER COMPONENTS TO BE AFFECTED C = relevant to construction stage O = relevant to operational phase	Probability value	Intensity value	Duration value	Severity value	Significance rating
Impact on the vegetation component of the site	C: 4 O: 2	4 2	4 2	4 2	16: High (negative) 4: low (negative)
Impact on the faunal component of the site	C: 4 O: 2	4 2	4 2	4 2	16: High (negative) 4: low (negative)
Impact on Red Data Fauna and Flora	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on soil (surface stability)	C: 3 O: 2	2 1	2 4	2 2	6: Low (negative) 4: Low (negative)
Impact on soil (topsoil layer - disturbance and compaction)	C: 3 O: 2	2 1	2 4	2 2	6: Low (negative) 4: Low (negative)
Impact on subsurface soil quality	C: 2	2	2	2	4: Low (negative)

ENVIRONMENTAL AND OTHER COMPONENTS TO BE AFFECTED C = relevant to construction stage O = relevant to operational phase	Probability value	Intensity value	Duration value	Severity value	Significance rating
	O: 2	2	4	3	6: Low (negative)
Impact on topography	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on geology	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on surface drainage and existing water bodies	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on surface water run-off quality	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on groundwater resources	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on air quality	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on ambient noise levels	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on cultural historical & archaeological elements	C: 4 O: 0	2 0	4 0	8 0	32: Very High (Negative) 0
Impact on the social environment of the adjacent landowners	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on traffic safety aspects	C: 4 O: 0	2 0	2 0	2 0	8: Moderate (negative) 0
Impact on land use & agricultural potential	C: 3 O: 2	2 2	1 2	2 2	6: Low (negative) 4: Low (negative)
Impact on visual and aesthetic quality	C: 3 O: 4	2 2	2 4	2 3	6: Low (negative) 12: Moderate (negative)
Impact on local economy (due to temporary job creation)	C: 4 O: 4	2 2	2 4	2 3	8: Moderate (positive) 12: Moderate (positive)
Impact on community (due to provision of affordable electricity)	C: 2 O: 4	1 2	2 4	2 3	4: Low (positive) 12: Moderate (positive)

The predominant range of impacts caused by activities during the construction phase, which are of a temporary nature only, are in the **low negative significance rating** bracket. During the operational phase of the proposed activity the

predominant range of impacts is in the **low negative significance rating** bracket. The impact of the development on the cultural historical & archaeological component of the site has the highest significance rating, namely Very Highly negative during the construction phase and no impact during the operational phase due to the nature of the activity (requiring the removal of the surface vegetation and topsoil, which subsequently destroys any and all archaeological elements of the site, which is found to be a lot). Moderately significant positive impacts are expected during the construction and operation phases of the proposed development in terms of the local economy and community as a result of temporary job creation during the construction phase and the provision of much needed cheap and sustainable electricity in the Kathu area.

SECTION E ALTERNATIVES

E-1 IDENTIFICATION OF ALTERNATIVES

The concept of Integrated Environmental Management suggests that an Environmental Assessment, to determine the possible impact of the proposed activity, should incorporate the consideration of feasible alternatives. Reasonable number of possible proposals or alternatives, to accompany the same objective should be assessed. In accordance with guideline 5 (DEAT, 2006) "assessment of alternatives and impacts" the identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental impact assessment. In the context of the site, which already enjoys an appropriate zoning and is not classified as a "green field" development, the consideration of similar-minded alternatives has been considered. Furthermore, the proposed activity preferred by the client - which is the development of a solar farm - is in line with the requirements of Kgalagadi District Municipality, given the need for a more and sustainable electricity component within Kathu and its surrounds.

E-2 FEASIBIBILITY AND COMPARISON OF ALTERNATIVES

E-2.1 Proposed Alternative: The Proposed site

Given that the alternative site 1 and its immediate surrounds are visually and aesthetically very attractive due to the proximity of the Kathu Forest Natural Heritage Site, natural hill vegetation with archaeological elements, and also given the surrounding land uses (the Sishen Iron Ore Mine southwest of the farm BESTWOOD); the Alternative site 1 suggests the proposed site for the proposed development. The proposed site is situated in old agricultural fields (east southeast

of the proposed site), which renders this option more feasible. This is due to the fact that there are no traces of archaeological elements and that the disturbed area has a very homogene vegetation growth in relation the proposed site, which makes it more ideal to place the solar farm here.

The proposed site is also more level ground that that of the alternative site 1, which will help with the construction of the foundation of the solar farm.

E-2.2 Alternative Sites 1 and 2:

See section **A-5.2** pg. 17.

E-2.3 No-Go Alternative

The do-nothing or no-go alternative implies that the status quo remains unchanged, with no further planning or development of the proposed solar farm. As mentioned, the proposed development will provide for much needed electricity for residential development of Bestwood and in the Kathu area. If the no-go alternative is implemented, the above mentioned benefits will not be gained and the ever increasing housing development, including Bestwood, in the Kathu area will not have sufficient electricity supply, which Eskom struggles to supply.

SECTION F KNOWLEDGE GAPS, UNCERTAINTIES AND ASSUMPTIONS

There was no knowledge gaps identified due to the fact that all relevant parties (I & APs and Specialists) were consulted and valuable information was received and recommendations made.

No assumptions were made also because the necessary studies were conducted and the information was made available to relevant stakeholders and these studies were incorporated into the planning and design of this development.

Uncertainties will always be part of any developments when it comes to the actual degree of impact it will have on the immediate environment, because no project is identical. Any and real results can only be recorded after the development has started and finished.

SECTION G ENVIRONMENTAL IMPACT STATEMENT

G-1 SERVICE PROVISION

G-1.1 Maintenance

No services are needed to the proposed solar farm. Only maintenance will be done a set time table.

G-2 BIOPHYSICAL- and SOCIOECONOMIC ENVIRONMENT

G-2.1 Flora

All impacts of the development were rated as low to medium significance. Recommendations from the specialist should be adhered to.

No red data species were recorded on site. There are two protected species for example *Acacia erioloba* on site that may not be removed without a permit given from the relevant authorities. This tree also provide shelter and wood to many vertebrates and invertebrates. The indigenous trees and shrubs should be retained as far as possible. See appendix 6 for an in-depth explanation.

G-2.2 Fauna

All impacts of the development were rated as low to medium significance. The proposed area of development does not support a unique faunal composition. Development of the proposed area, with regards to the mammalifauna, avifauna and herpetofauna, should not impact negatively on the ultimate survival or dynamics of the encountered taxa and can proceed as planned.

G-2.3 Historical Value

Please see section **B-1.7** pg. 30.

TABLE 7: Comparative assessment of alternative land uses and developments

Environments Affected	Solar farm	No - Go
Geology	No Impact.	No impact.
Topography	No Impact.	No impact.
Soil, Land Capability and Land Use	Soil compaction. Possible soil erosion due to removed vegetation.	No impact.

Environments Affected	Solar farm	No - Go
	Surface disturbance and topsoil removal.	
Flora	Stripping of surface vegetation during construction.	No impact.
Fauna	Removal of surface vegetation thereby depleting food sources. Human presence resulting in emigration of animals. The disturbances of the vegetation cover and natural habitat will have a limited impact on the wildlife. However, it should be viewed against the background of the disturbances by human movement and activities through the area.	No impact.
Surface Water	A small restriction of natural drainage.	No impact.
Ground Water	No potential environmental impact	No impact.
Air Quality	No potential environmental impact.	No impact.
Noise	No potential environmental impact.	No impact.
Visual	No significant impact.	No impact.
Sensitive Landscapes	No potential environmental impact.	No impact.
Sites of Archaeological and Cultural Interest	High impact due to the destruction on archaeological elements during the construction phase.	No impact.
Socio-economic	Positive impact on the regional socio-economic structure through its support to the community, like: ▲ Job opportunities. ▲ Greener and sustainable electricity	Negative Impact due to no job opportunities created.
Interested and Affected	No impact.	No impact.

Environments Affected	Solar farm	No - Go
Parties		
Cumulative	TThe cumulative impact of the development on the social environment is positive. Cumulative impact on other physical components such as natural vegetation and animal life, air quality and visual impact is not regarded as of high significance, due to the out stretched and spacious nature of the landscape.	No impact.

SECTION H CONCLUSION AND RECOMMENDATIONS

The Environmental Impact Assessment (EIA) Process for the proposed solar farm on the farm BESTWOOD 459-RD has been undertaken in accordance with the EIA Regulations published in Government Notice R385 of 21 April 2006 in terms of the National Environmental Management Act (Act No. 107 of 1998).

The essence of any EIA process is aimed at ensuring informed decision-making and environmental accountability, as well as to assist in achieving environmentally sound and sustainable development. This is achieved by conducting an analysis of the potential impacts that a proposed development may have on the physical, environmental and social aspects of the concerned area. In order to minimise the potential impacts associated with the proposed development, an Environmental Management Plan (EMP) is compiled, which must be implemented in order to sufficiently mitigate the anticipated impacts to an acceptable level.

H-1 AUTHORIZATION OF PROJECT

The identification and description of the potential or anticipated impacts (herein referred to as environmental aspects) was the result of an assessment of the relevant environmental conditions and the issues identified during the public participation exercise, terrain assessments, specialist studies and desk research. An objective rating of the SIGNIFICANCE of the potential impacts resultant of the proposed development revealed that impacts were predominantly LOW (negative) and (negative) - with only one high negative impact anticipated (archaeological) -

during the construction and operational phases respectively. This means that it is possible for the project to proceed, providing that the impact mitigation measures provided are strictly implemented in the design, construction and operational phases of the development.

The scoping and EIA processes revealed that no fatal environmental flaws were identified that should prevent the approval of the proposed development. In summary, the **main environmental aspects** that need to be addressed during project implementation are:

- **Design stage:** The proposed solar farm position layout should be well thought out, in terms of the proposed site and the alternative.
- **Construction stage:** Addressing general social and traffic safety, air quality, noise generated, waste management, construction and restoration/landscaping of the site.
- **Operational stage:** Maintaining the farm on a regular basis and using only the established access roads.

The ultimate approval of this project lies with the ruling of the Department of Environmental Affairs (DEA). However, this EAP (Rock Environmental Consulting) is of the independent opinion that the EIA process has determined that there are no fatal environmental flaws that would constitute the refusal of Authorisation of the project and that there is sufficient need and desirability shown by the Local Municipality in support of a development of this nature. It is trusted that this Environmental Impact Assessment Report gives a balanced view of the anticipated environmental impacts associated with the proposed development and that the Environmental Management Plan attached herewith will adequately mitigate the impacts ▫

SECTION I ANNEXURES

Appendix 1: Locality Map

Appendix 2A: Conceptual Layout Plan (Proposed) and Site Photos

Appendix 2B: Conceptual Layout Plan (Alternative)

Appendix 3A: Background Information Document

Appendix 3B: Acknowledgement of Receipt of BID

Appendix 3C: Copy of press advertisement

Appendix 3D: Site Notice and Supporting Photographs

Appendix 3E: Comments and Registration Sheets Received from I&APs

Appendix 3F: List of I&APs

Appendix 3G: Comment and Response Report

Appendix 4: Significance Rating Methodology

Appendix 5: EAP CV

Appendix 6: Vegetation Survey

Appendix 7: Ecological Impact Assessment: Vertebrate Fauna

Appendix 8: Heritage Impact Assessment Report / Archaeological Report & VIA

Appendix 9: Motivational Memorandum

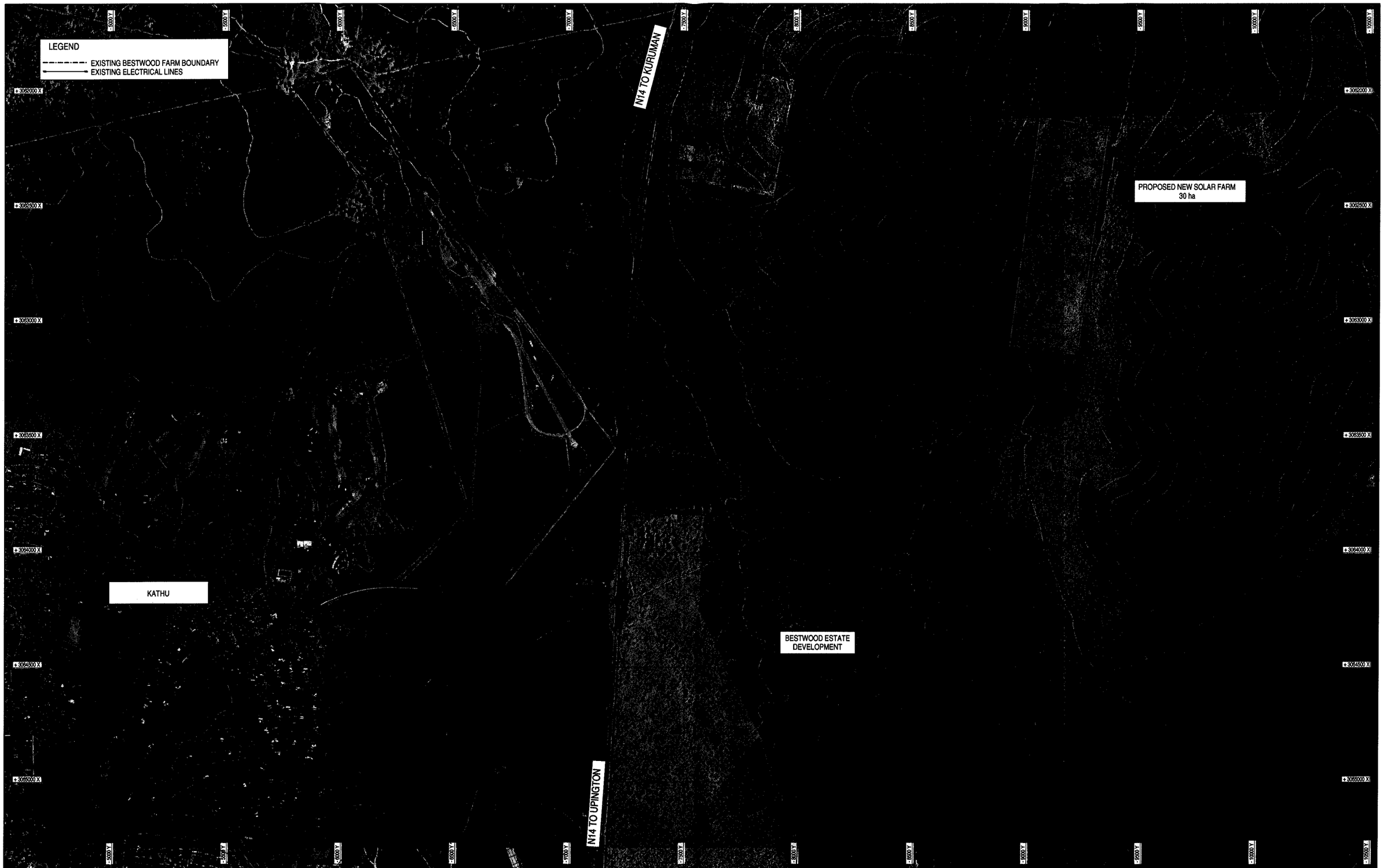
Appendix 10: Environmental Management Plan

APPENDIX 1

LOCALITY MAP

REC

ROCK ENVIRONMENTAL CONSULTING (PTY) LTD



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1 : 7 500

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

No	AMENDMENTS	APP.	DAT.

V&W Consulting Engineers
P.O. BOX 95256
WATERKLOOF
0145
TEL: (012) 346-1255
FAX: (012) 460-5734

DESIGNED BY C. STRYDOM
DRAWN BY C. STRYDOM
DESIGN CHECKED A. DE BRUYN
DRAWING CHECKED S.G. STRYDOM

NOTED BY
P. GAMAGARA MUNICIPALITY DATE

APPROVED BY
2009/12/04
P. V&V CONSULTING ENGINEERS DATE

PROPOSED NEW SOLAR FARM

LOCALITY PLAN

Bestwood ESTATE
KATU BUILDING TOGETHER

TOWNSHIP DEVELOPMENT ON PORTION 56 OF THE REMAINING PORTION OF THE FARM BESTWOOD 459RD BESTWOOD ESTATE

TYPE OF DRAWING
DETAIL

CONTRACT NUMBER
VV-665

DRAWING NUMBER
665/VV/02Lp

REVISION NUMBER . . . . . .

LOCALITY PLAN : NOT TO SCALE

SCALE 1 : 25 000 SCALE ON REDUCED DRAWING 100mm ON ORIGINAL DRAWING	No	AMENDMENTS	APP.	DAT.	V&V Consulting Engineers P.O. BOX 95256 WATERKLOOF 0145 TEL: (012) 346-1255 FAX: (012) 460-5734 DESIGNED BY C. STRYDOM · DRAWN BY C. STRYDOM DESIGN CHECKED A. DE BRUYN · DRAWING CHECKED S.G. STRYDOM
					NOTED BY P. GAMAGARA MUNICIPALITY DATE APPROVED BY P. V&V CONSULTING ENGINEERS DATE
PROPOSED NEW SOLAR FARM REGIONAL MAP					Bestwood ESTATE · KATU BUILDING TOGETHER TOWNSHIP DEVELOPMENT ON PORTION 56 OF THE REMAINING PORTION OF THE FARM BESTWOOD 459RD BESTWOOD ESTATE
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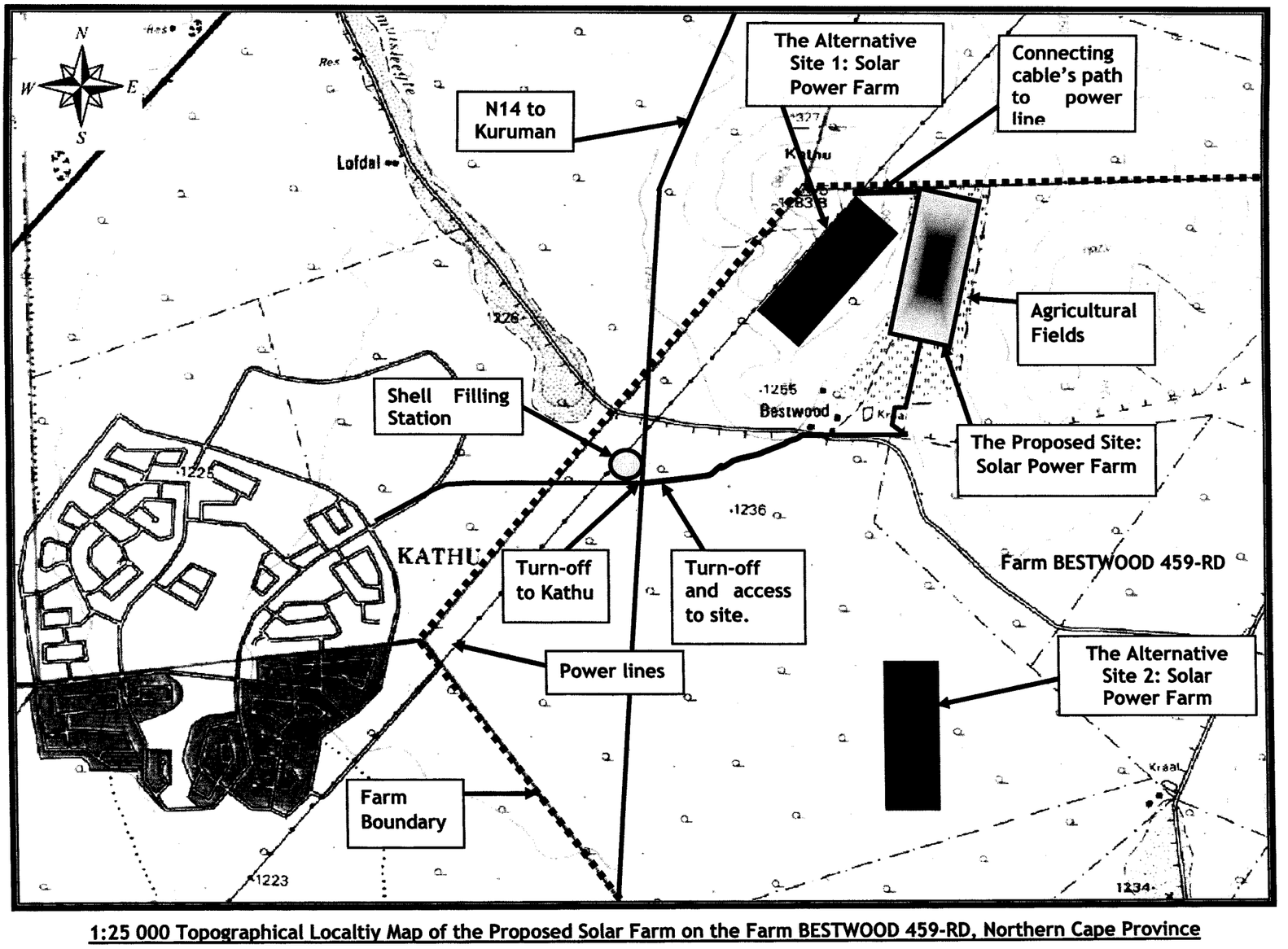


1:25 000 Topographical Localtiy Map of the Proposed Solar Farm on the Farm BESTWOOD 459-RD, Northern Cape Province

APPENDIX 2A

CONCEPTUAL LAYOUT PLAN (PROPOSED) AND SITE PHOTOS

REC

ROCK ENVIRONMENTAL CONSULTING (PTY) LTD

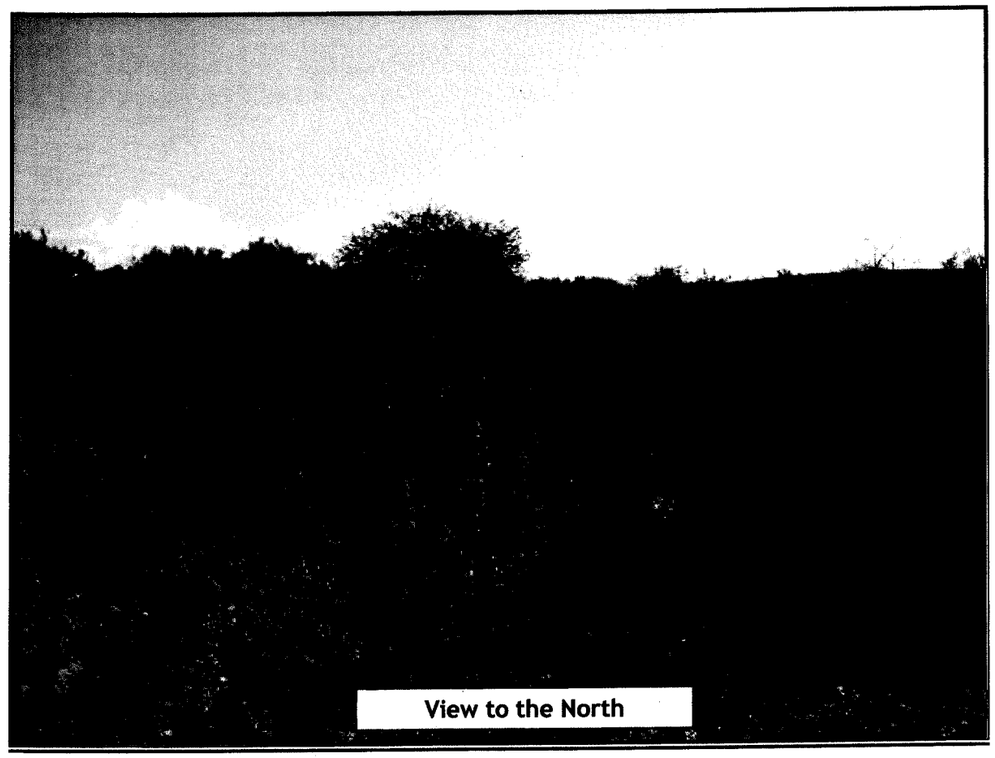
	SCALE 1 : 10 000	1	07/2010	AMENDMENT NEW TITLEBLOCK		DESIGN BY C. STRYDOM	V&V Consulting Engineers	LAYOUT PLAN EXTERNAL SERVICES	Bestwood ESTATE	NOTED BY
AS BUILT NOTE	SCALE ON REDUCED DRAWING					DESIGN CHECKED A. DE BRUYN	P.O. BOX 95256 WATERKLOOF 0145 TEL: (012) 346-1255 FAX: (012) 460-5734			p. OMAGARA MUNICIPALITY DATE
AS BUILT NOTE	100mm ON ORIGINAL DRAWING					DRAWN BY C. BEZUIDENHOUT			TOWNSHIP DEVELOPMENT ON PORTION 56 OF THE REMAINING PORTION OF THE FARM BESTWOOD 459RD BESTWOOD ESTATE	APPROVED BY
		NO	DATE	AMENDMENTS	APPROVED	DRAWING CHECKED C. STRYDOM				p. V&V CONSULTING ENGINEERS DATE

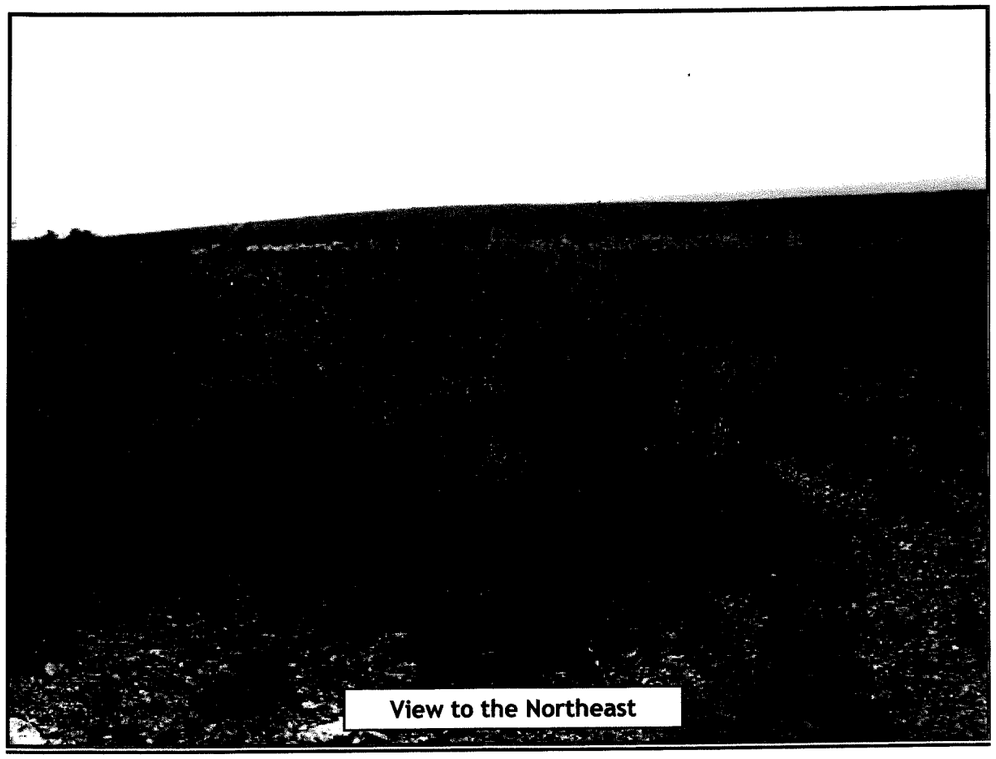
TYPE OF PLANNING: DETAIL
CONTRACT NUMBER: VV / 665
DRAWING NUMBER: 665/VV/01Lp
REVISION NUMBER:

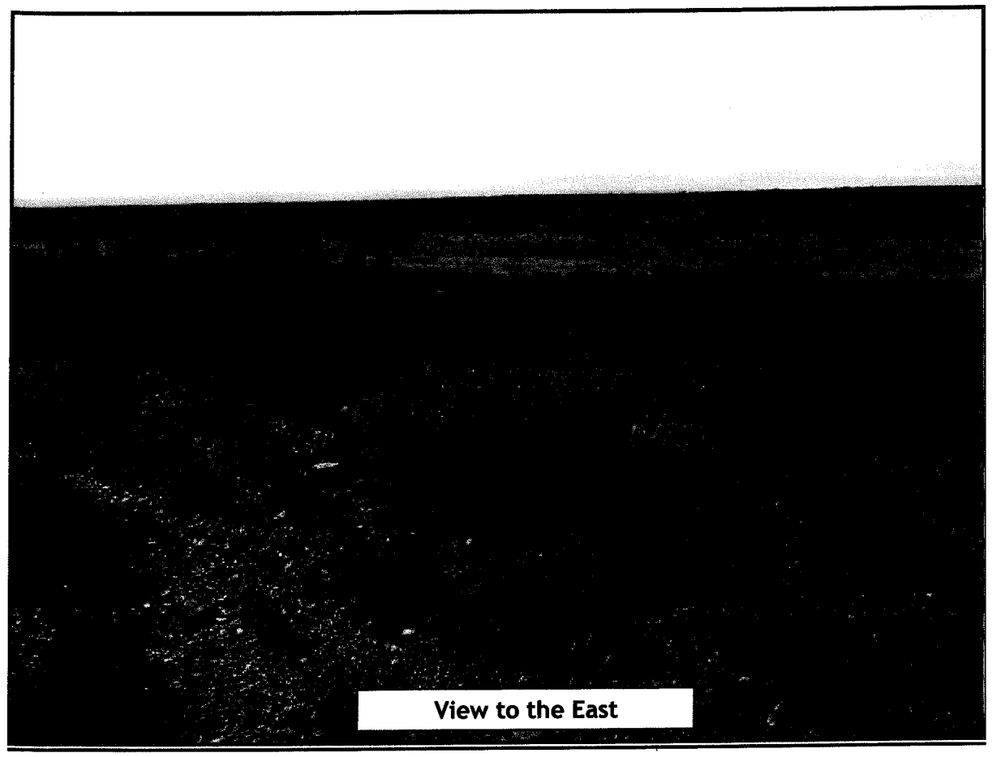
DWG No. 665/VV/01Lp

SITE PHOTOS of ALTERNATIVE SITE

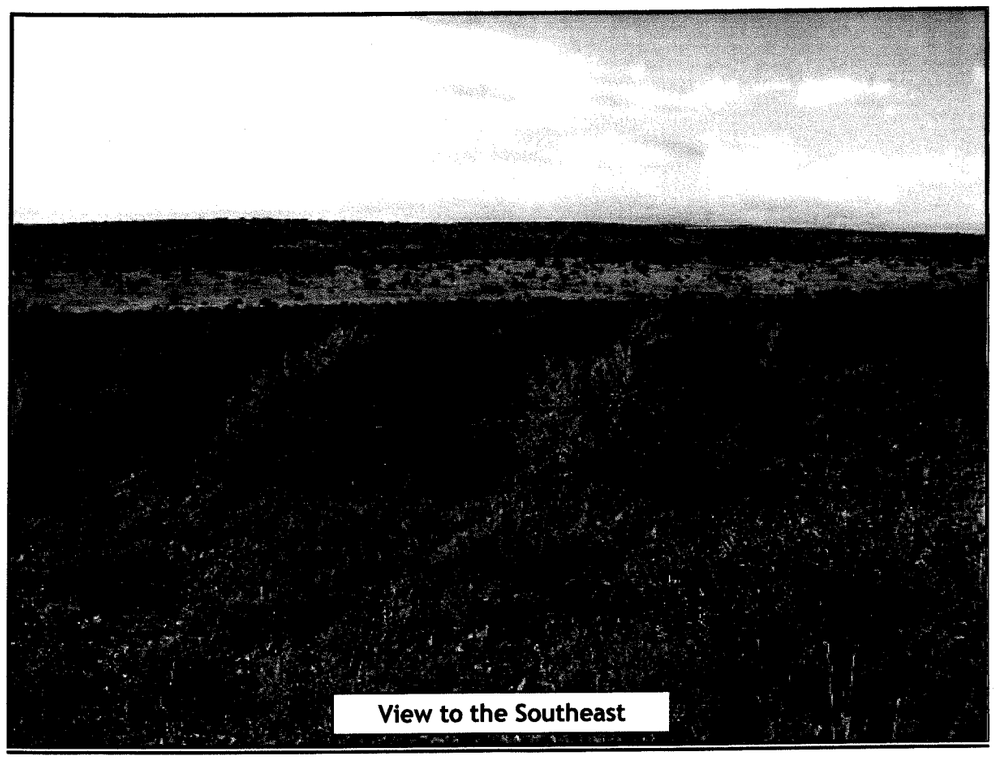
Middel of Site



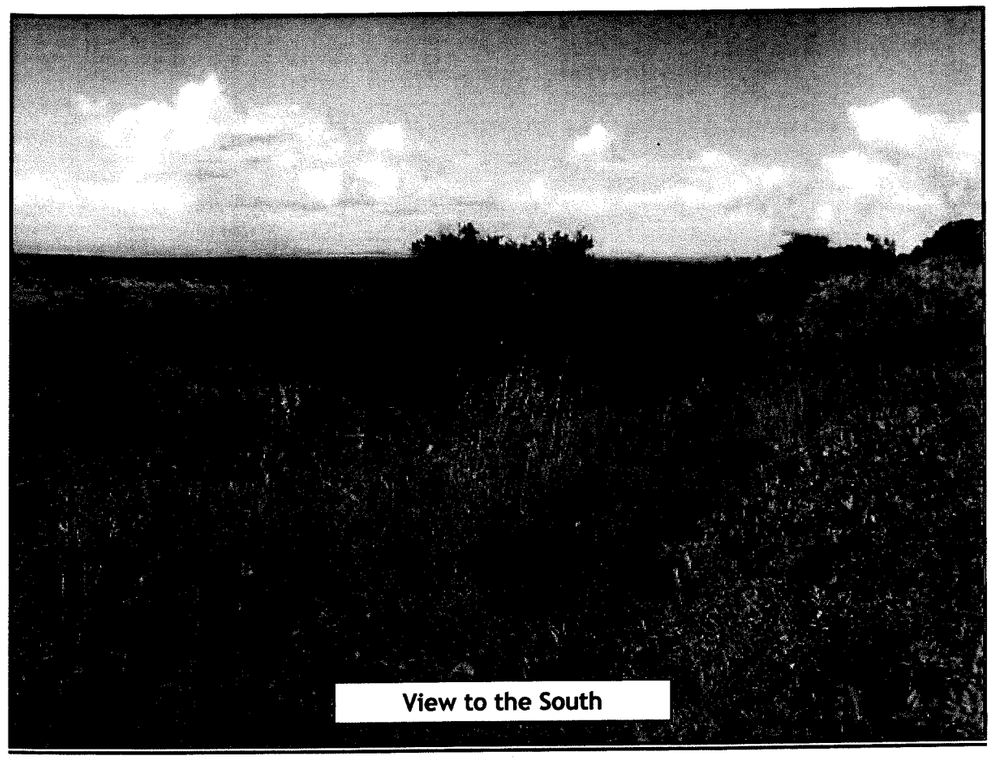




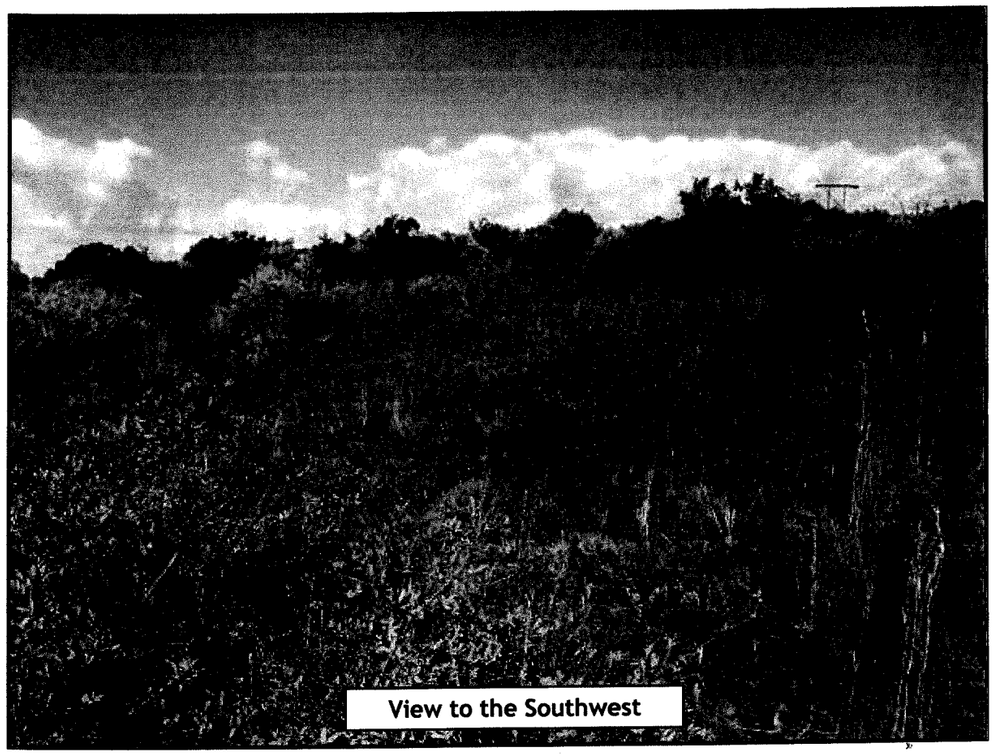
View to the East



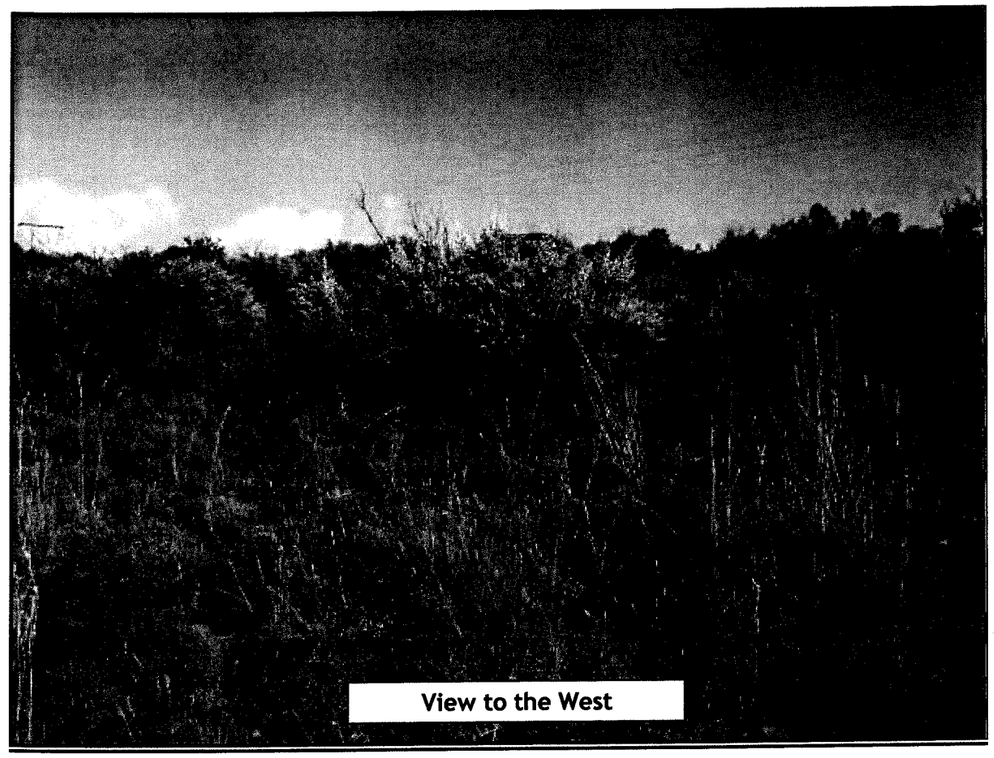
View to the Southeast



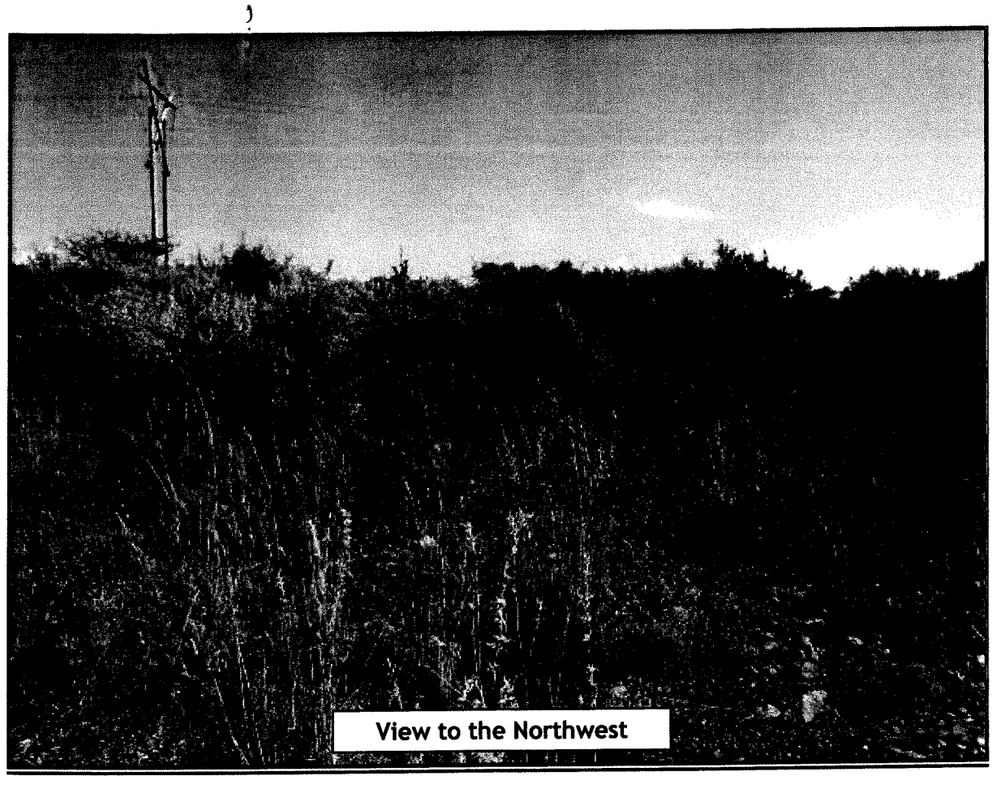
View to the South



View to the Southwest



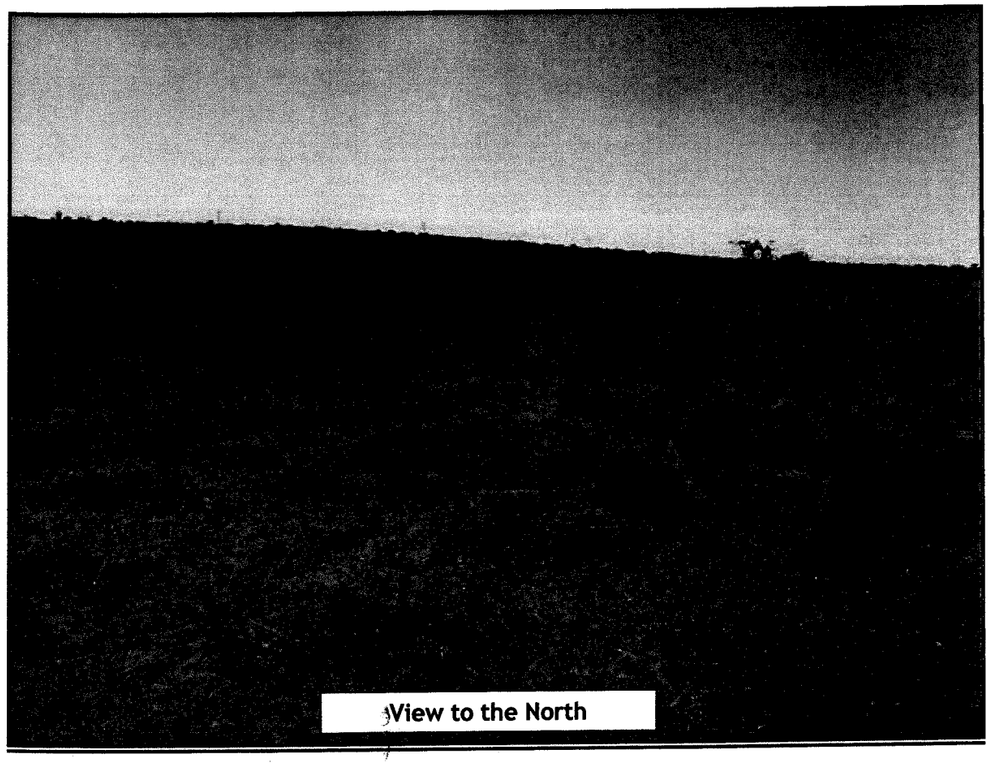
View to the West

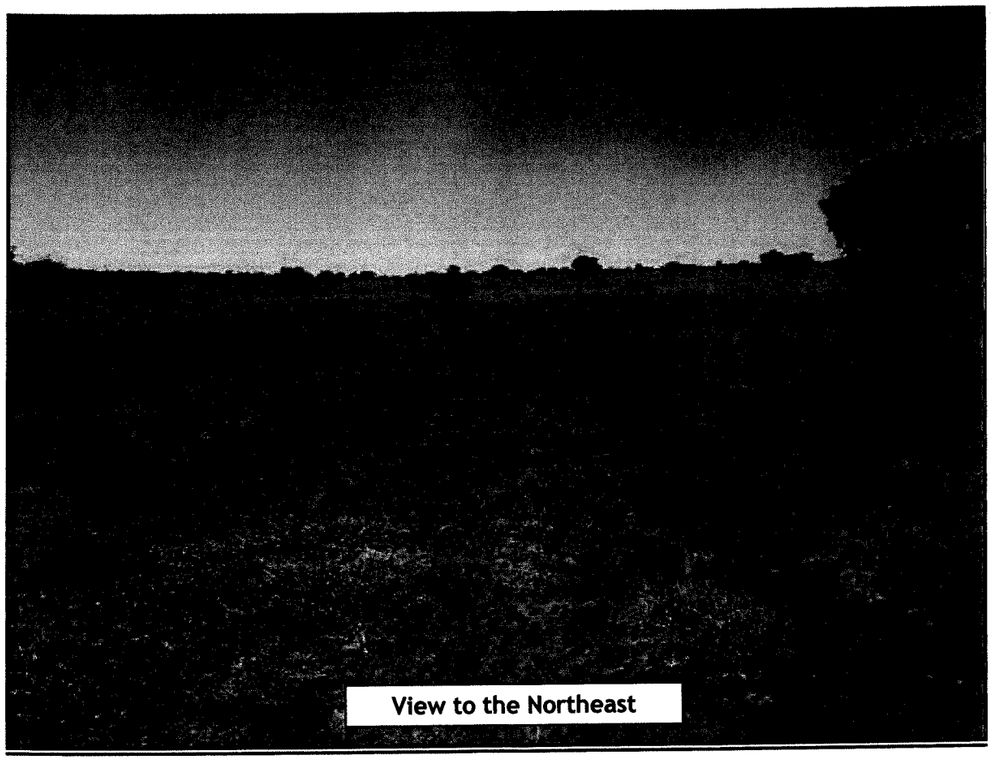


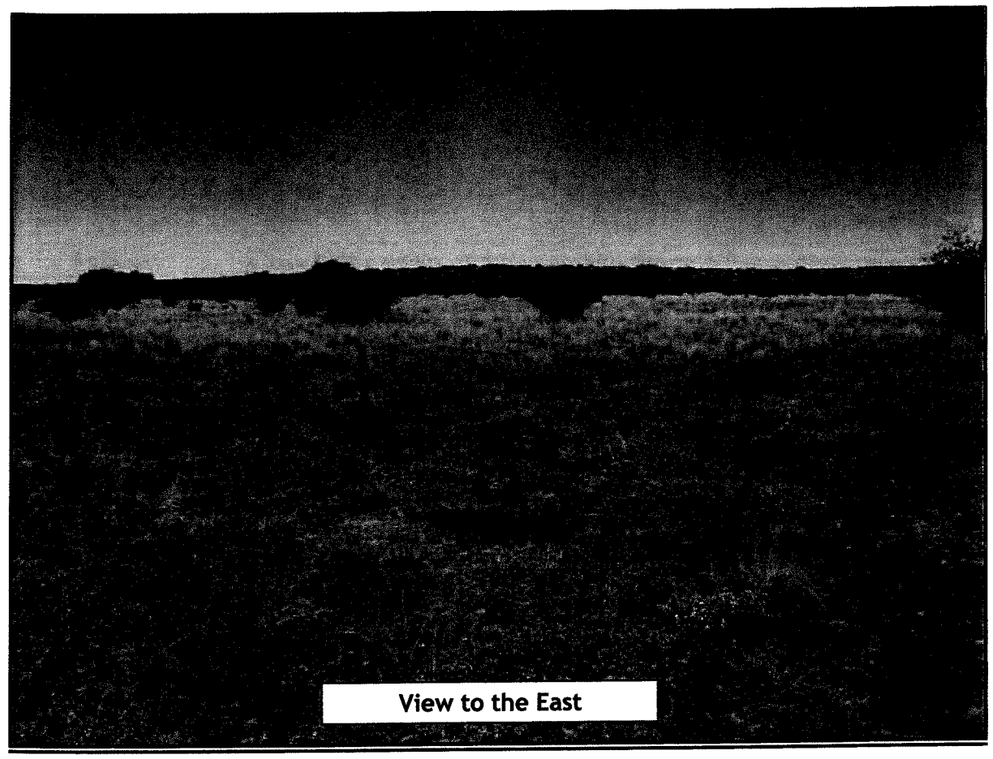
View to the Northwest

SITE PHOTOS of PROPOSED SITE

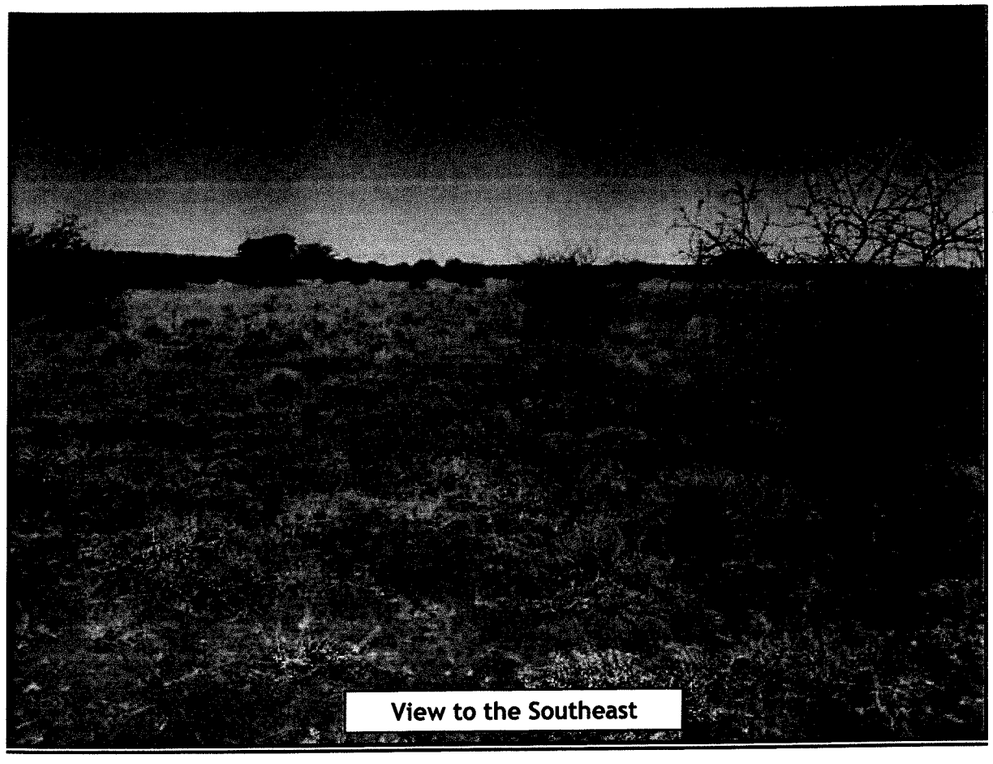
Middel of Site



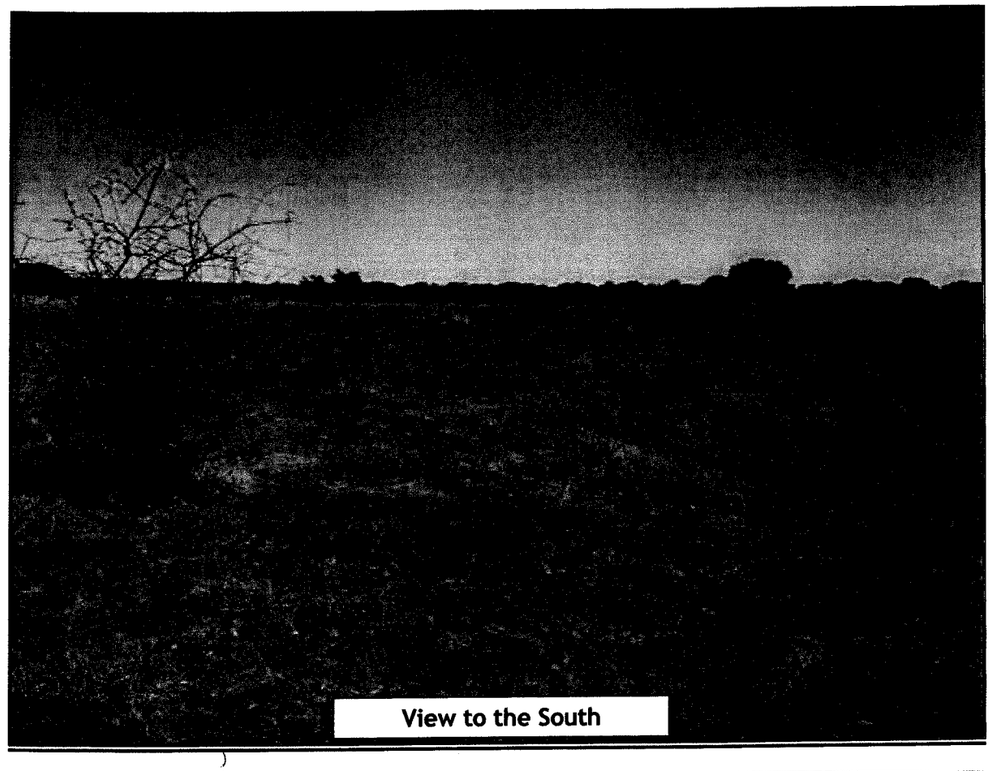




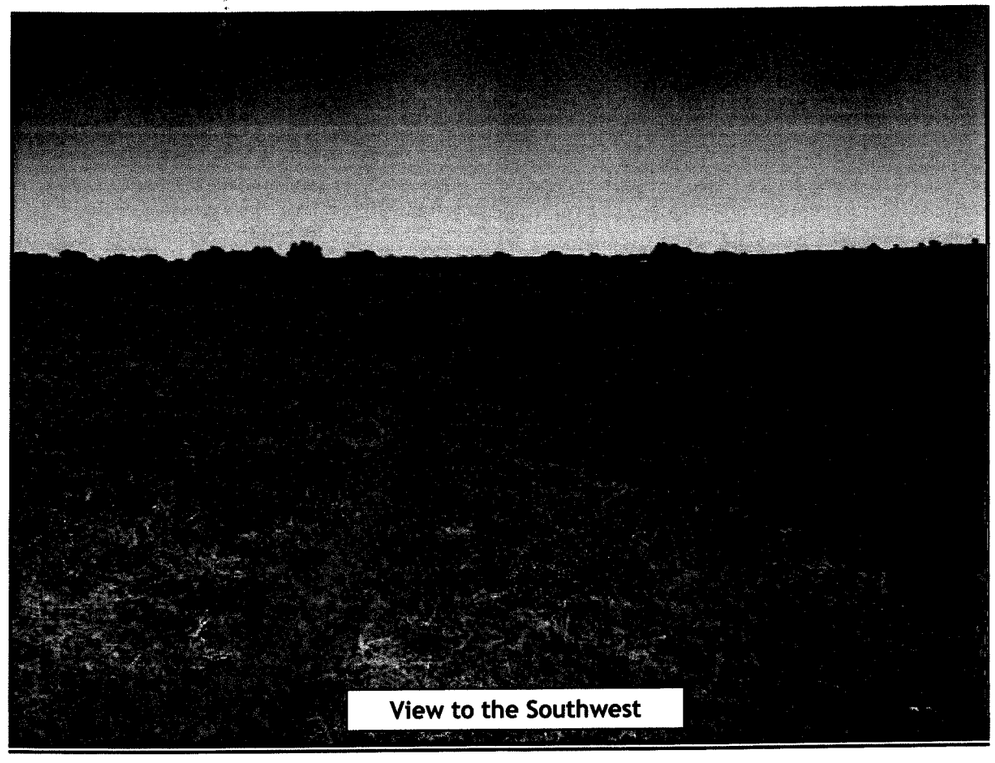
View to the East



View to the Southeast



View to the South



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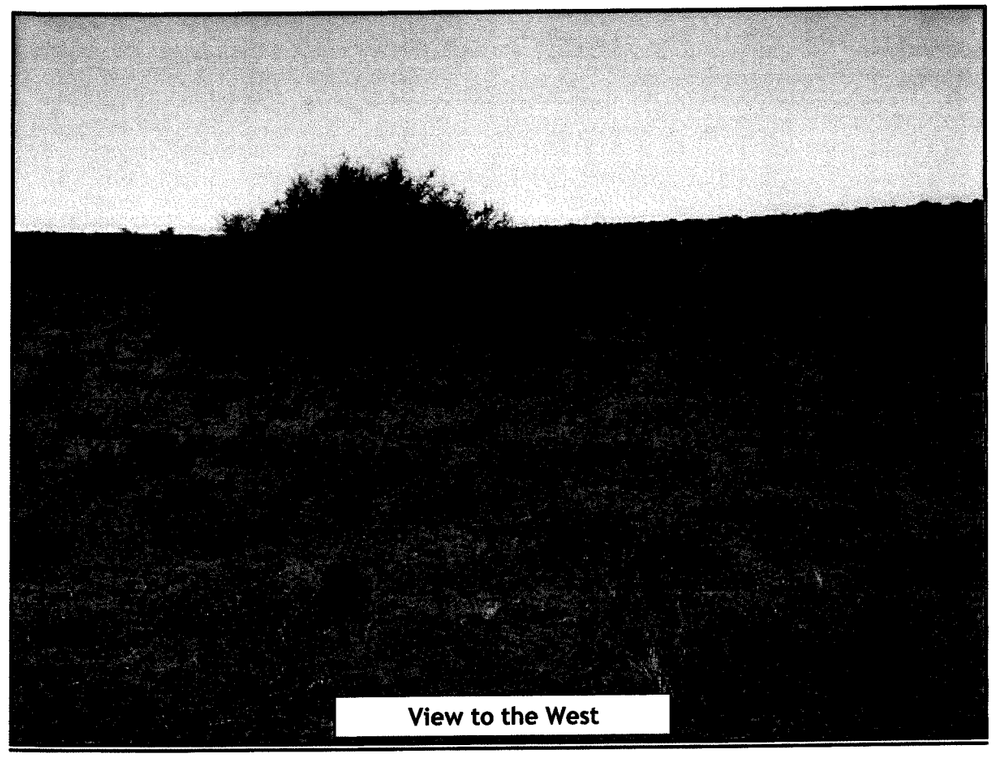

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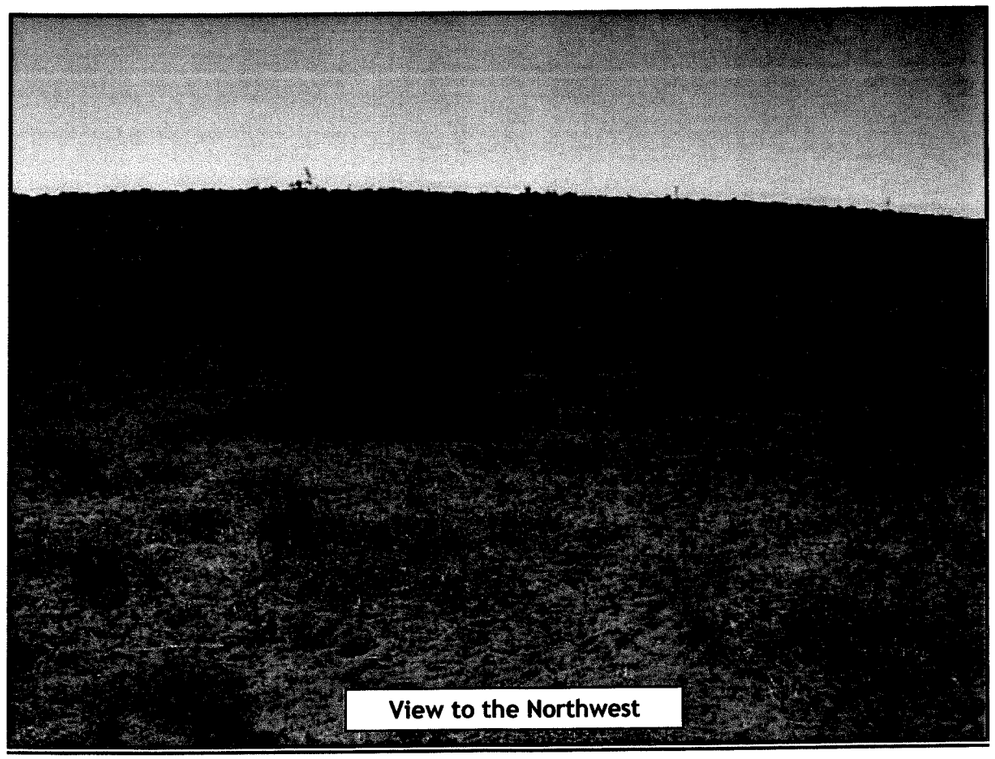
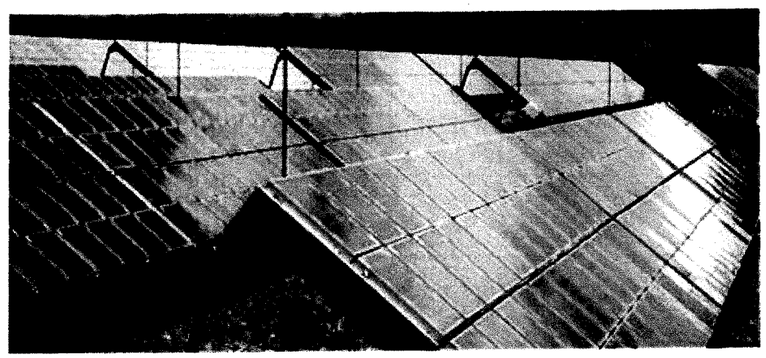
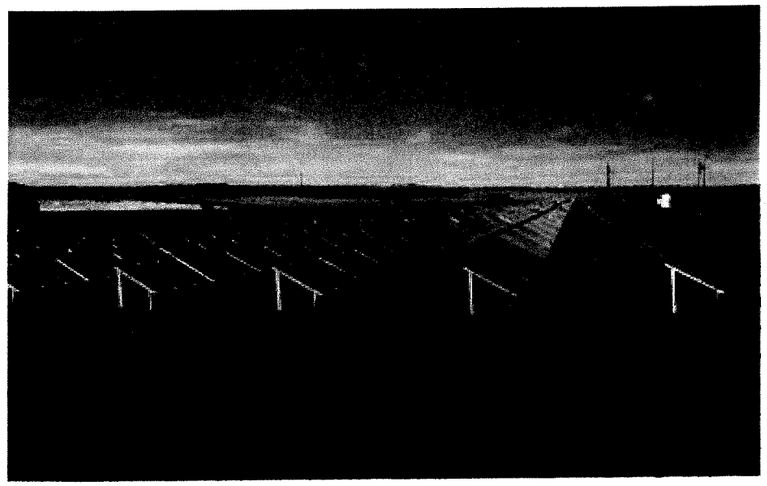


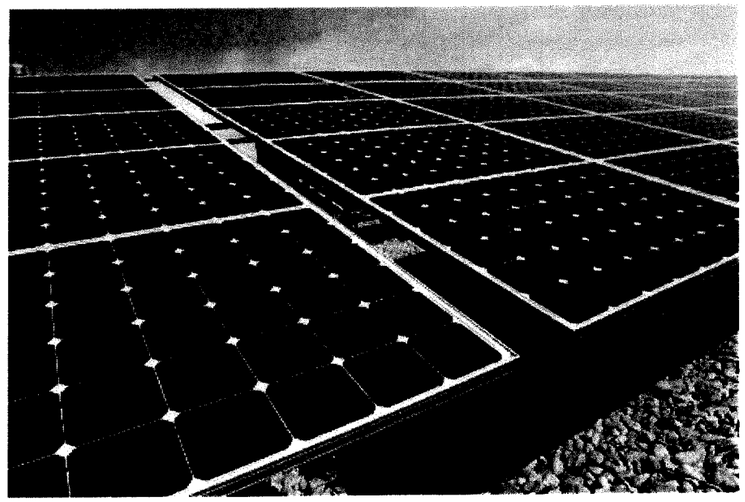
View to the Northwest

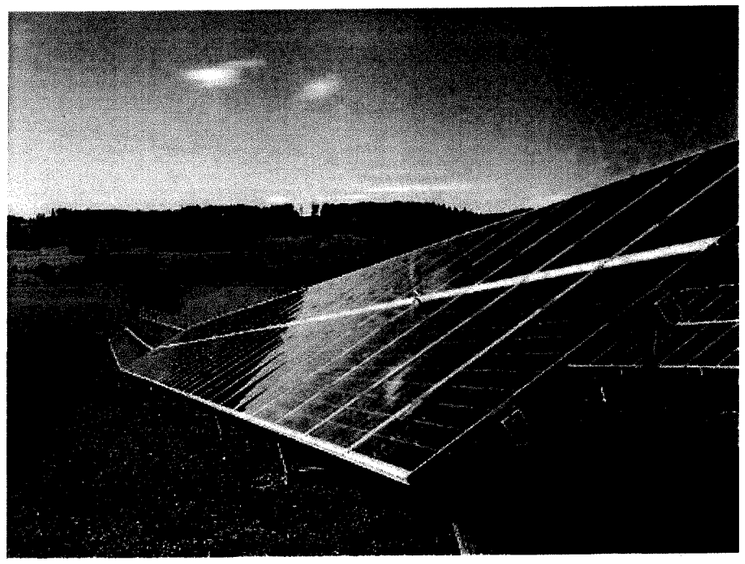
Photo Voltaic Solar Panel Farm Example

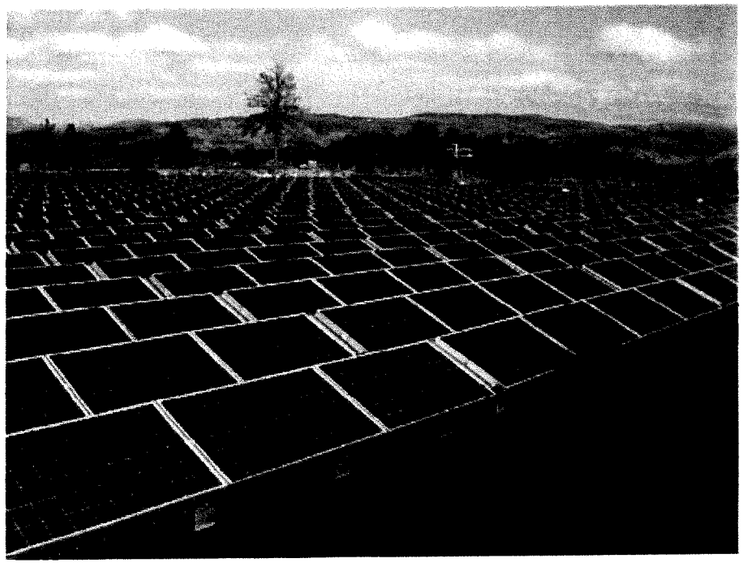
Although no grass or other vegetation will be allowed to grow under the solar panels.
This is to help prevent veld fires from damaging the solar panels.











APPENDIX 2B

CONCEPTUAL LAYOUT PLAN (ALTERNATIVES)

REC

ROCK ENVIRONMENTAL CONSULTING (PTY) LTD