

# Agricultural Potential Report

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Scuitdrift Solar Project (Pty) Ltd

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## 1. Introduction

The area that has been surveyed is the proposed site for the development of a photovoltaic (PV) solar energy facility. The purpose of the study is to investigate the impact of the development on the agricultural potential of the farm on which the facility is planned.

The investigation entails the identification of the agricultural potential in terms of:

- Locality
- Topography
- Geology and soil
- Climate and water availability
- Vegetation and grazing capacity
- Current and surrounding activities
- Infrastructure and access routes
- Other possible land uses

## 2. Locality Plan

The proposed development site is located west of the town of Kakamas, on Farm 426 Skuitdrift. The farm covers an area of approximately 9800 hectares and falls within the jurisdiction of the Kai Garib Local Municipality. The proposed 10MW solar energy development site is nearly 20 hectares.

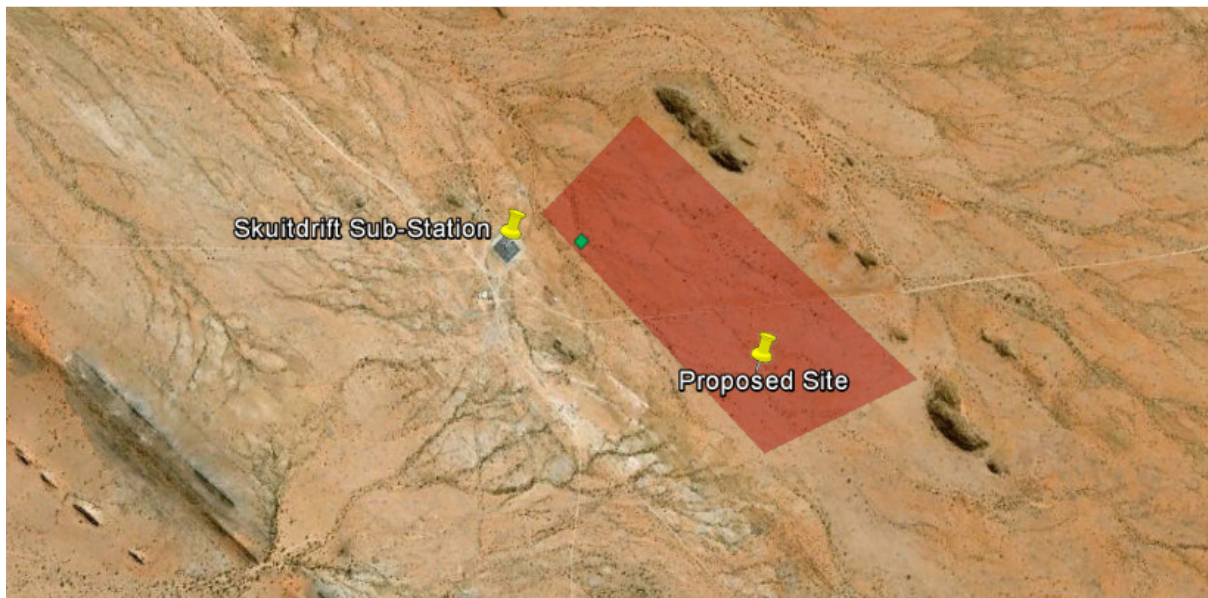


Figure 1: Aerial view of proposed 10MW solar development site

## 3. Topography

The nature of the plain in which the proposed development site is situated, is very homogeneous in terms of topography. The site is characterized by a flat and gentle slope. The moderate topography is beneficial in terms of the agricultural potential, as well as the proposed development.



Figure 2: The Moderate Topography of the Proposed Development Site

#### 4. Geology

The dominant rock types in the area are granite and sand and forms part of the Natal Namaqua metamorphic province, which is characterised by granites and old sedimentary deposits.

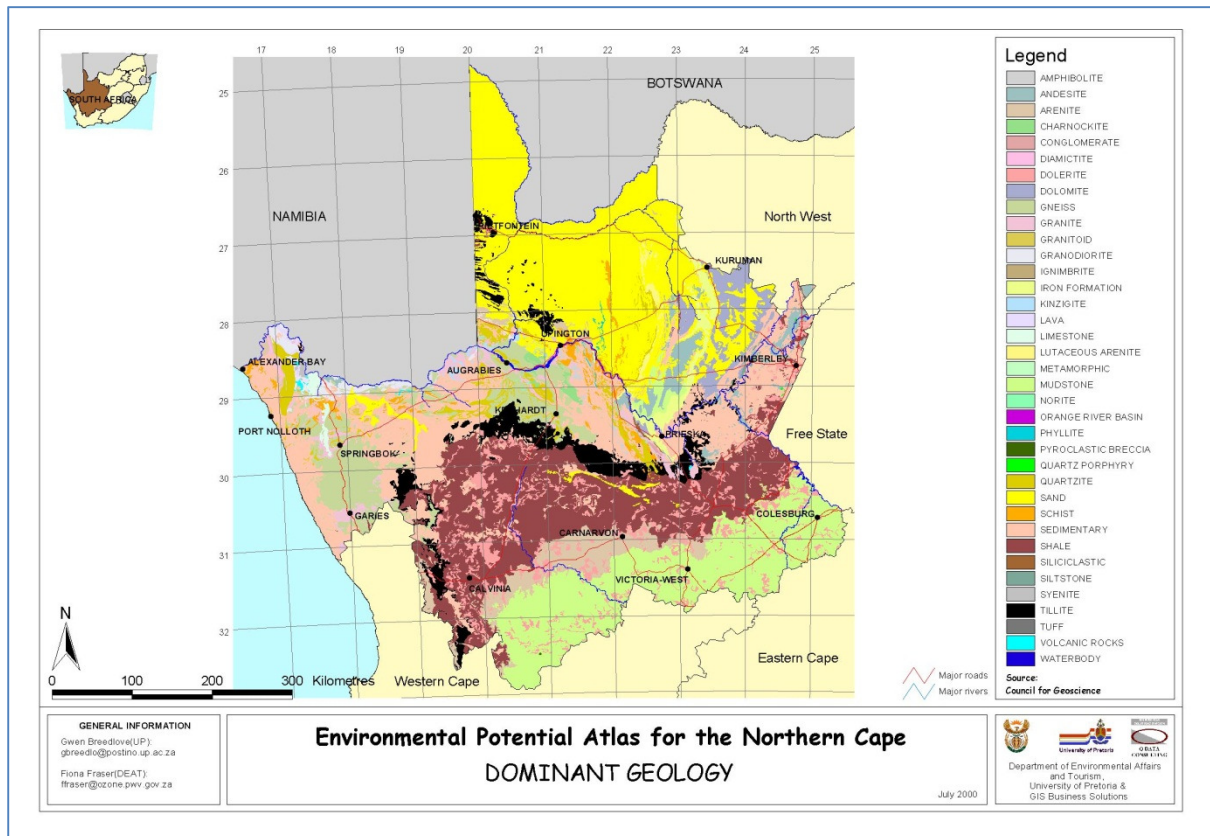


Figure 3: The Distribution of Rock types in SA

The area on which the proposed development site is located consists mainly of dune sand and rocky outcrops and is not fit for the extensive cultivation of crops and grains. The soil is shallow, generally less than 450mm, on hard or weathering rock. The soil is mainly calcareous, typical of arid climates, and contains less than 15% clay. Calcareous soils develop in regions of low rainfall and usually only become productive under irrigation.

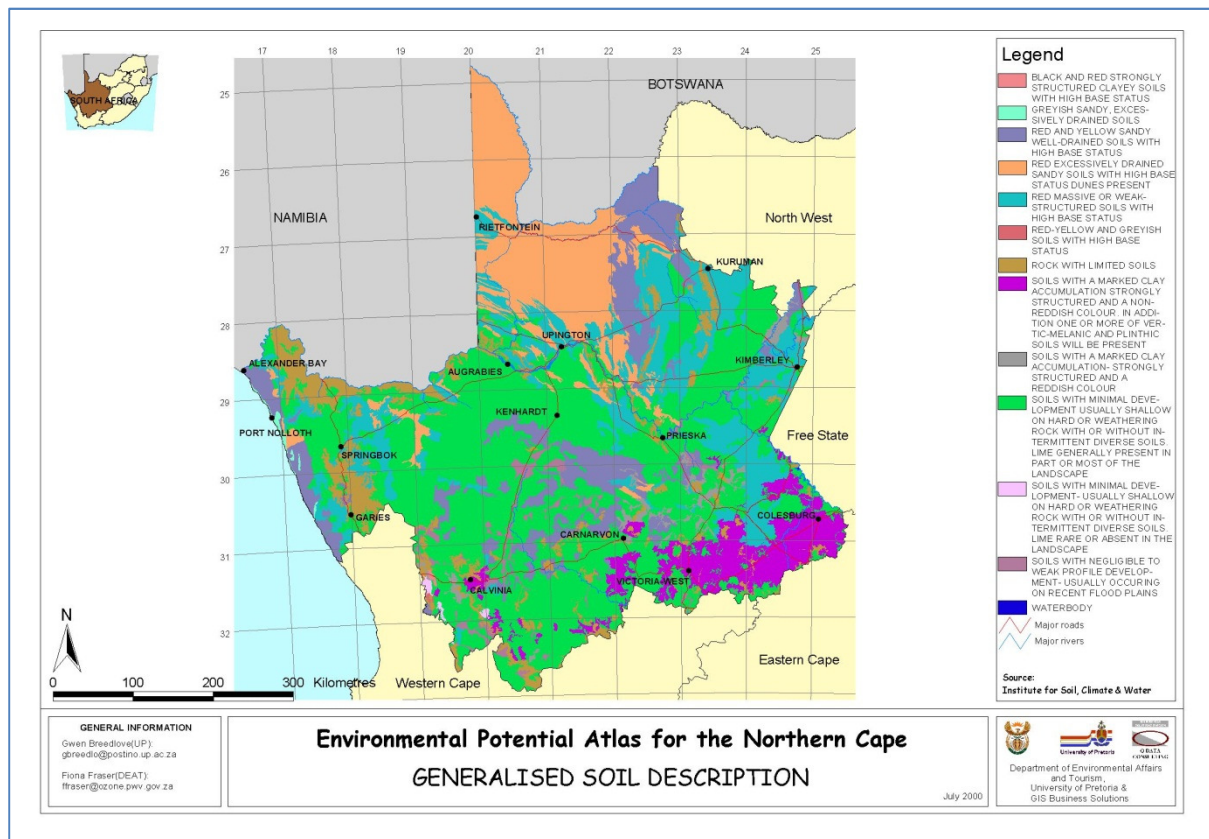


Figure 4: Soil Types of the Northern Cape

The surface of the area is covered with pebbles and rocky outcrops are plentiful. The geology of the area makes the cultivation of crops very difficult.



Figure 5: Pebbles covering the ground surface and Rocky Outcrops Found within the Proposed Development Site

## 5. Climate

The climate of the area in which the proposed development site is situated, is not favourable for intensive agriculture. This is mainly due to the low rainfall and the extreme temperatures that characterises the region.

The Kakamas area is a summer rainfall district. It is a semi-desert area with arid conditions, with an average annual precipitation of approximately 100 mm, which is extremely low. The variation of annual precipitation is very high.

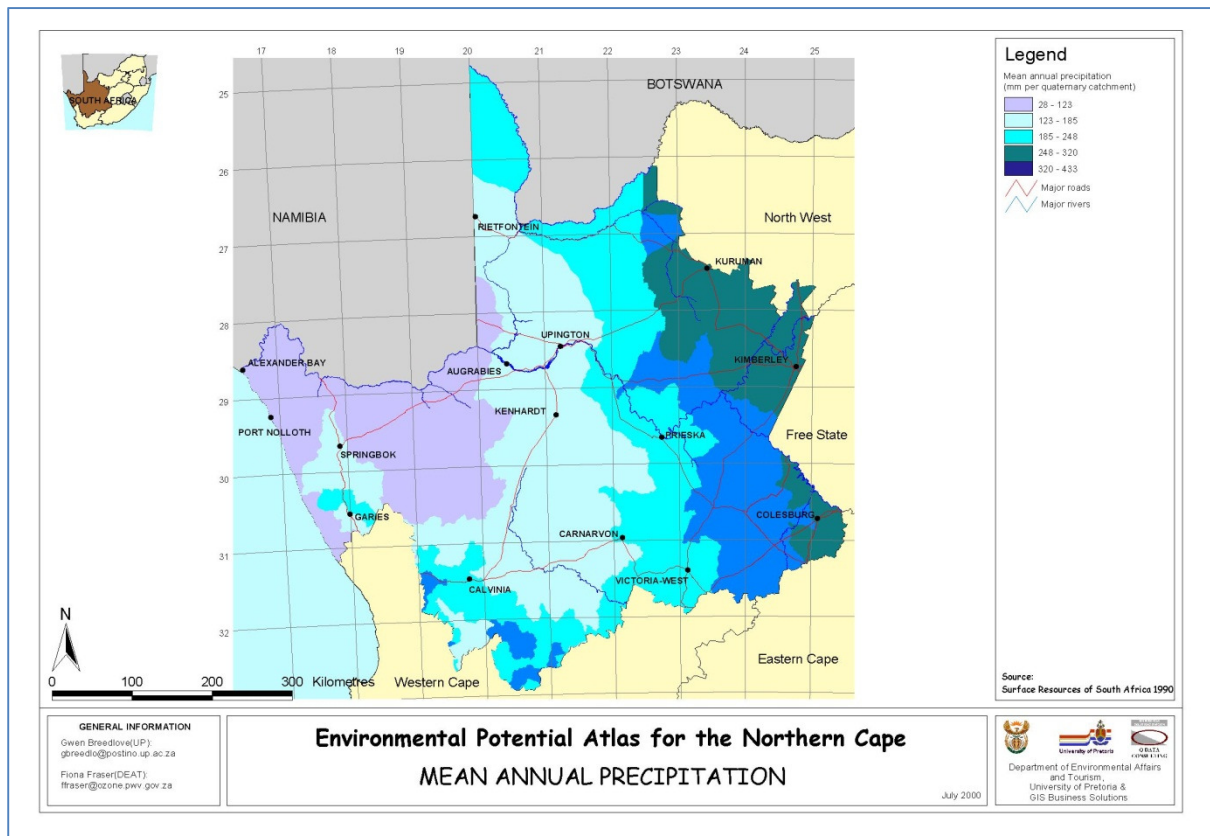


Figure 6: Average Rainfall for the Northern Cape

The day temperatures are known to become extremely high and range on average between 21°C and 36°C. In winter months it can become very cold, with frost occurring regularly.

## 6. Vegetation

The vegetation within the proposed development site is homogeneous and apart from a few small washes, there is little differentiation. The farm is situated within the Nama Karoo biome and the dominant vegetation type is Blouputs Karroid Thornveld. Other vegetation types which occur in the vicinity of the site include Lower Gariep Broken Veld, Bushmanland Arid Grassland and along the banks of the Orange River, Lower Gariep Alluvial Vegetation.

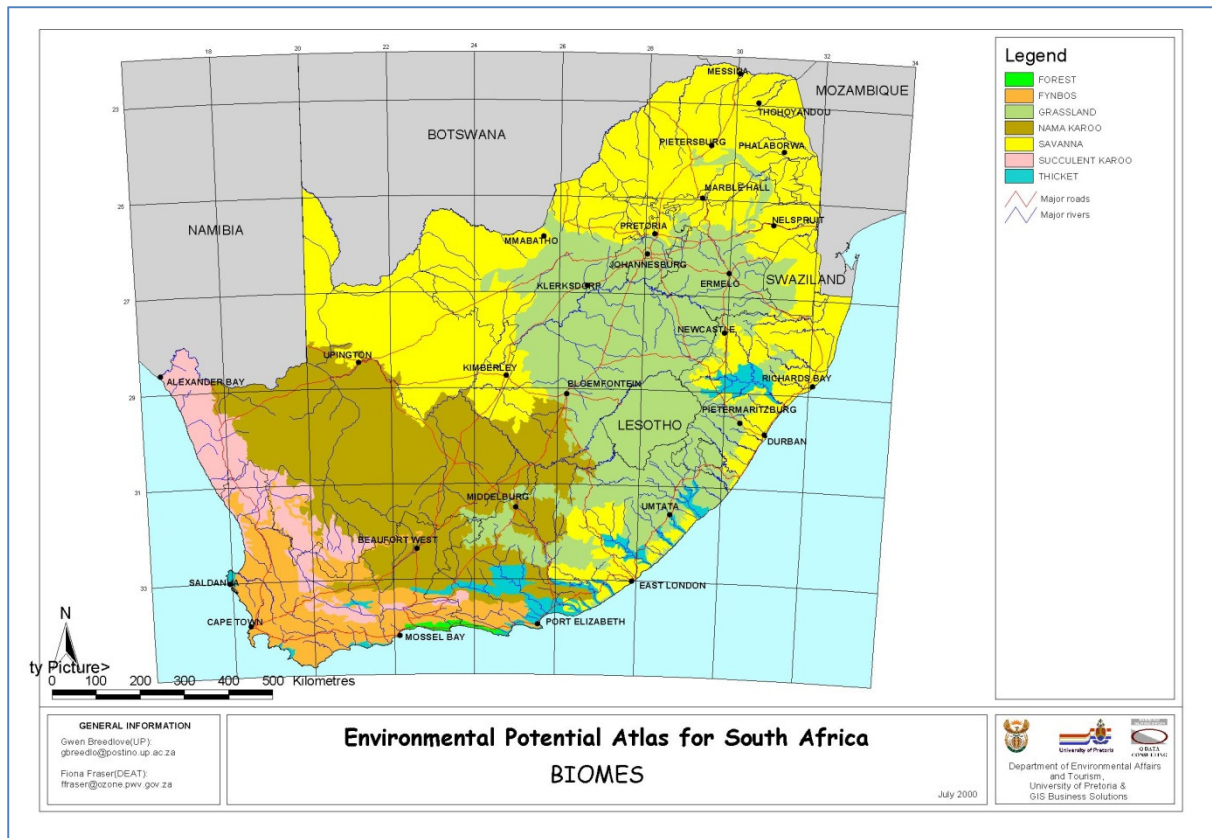


Figure 7: The Biomes of South Africa

There are only two vegetation communities within the development site, namely that of the washes and that of the adjacent plains. The plains within the development area are generally open with occasional scattered trees of *Acacia erioloba*, *Acacia mellifera* and *Boscia foetida*. The plains are dominated by the grasses *Stipagrostis uniplumis* (Blinkaarboesmangras), *S.ciliata* (Aandgonna) and *Schmidtia kalahariensis* with occasional shrubs such as *Rhigozum trichotomum*, *Phaeoptilum spinosum* and *Salsola rabieana*. The washes contain a higher abundance of trees, mostly *Acacia mellifera* and *Boscia foetida* as well as shrubs such as *Phaeoptilum spinosum* and *Monechma spartioides*.



Figure 8: Example of the dominant vegetation

The most common vegetation types found within the proposed site are annual grasses. Annual grass types such as *Schmidtia kalahariensis* and *Stipagrostis uniplumis* are commonly found in areas with low rainfall and are known to be an indicator of veld deterioration. The grazing value of these plant types is relatively poor.

## 7. Grazing Capacity

According to the Department of Agriculture, the prescribed carrying capacity of the farm is 60 ha per unit of cattle or 15ha per sheep. The proposed site of 20ha is too small to house even one unit of cattle or more than one sheep. The proposed site does not have any significant value in terms of its grazing capacity.

## 8. Current Activities

The farm is currently utilised for stock farming. The entire farm is under indigenous vegetation that is being used as grazing for some 800 ewes and 80 heads of cattle. Although the area is very dry, there is no need to provide extra feed to the livestock, since there is ample vegetation along the riverbanks. Predators pose a great threat to livestock farming in the area, since jackals, leopards and caracals wreaks havoc among the sheep.

## 9. Existing Infrastructure

The built infrastructure on the farm includes a homestead, a windmill, cement reservoirs, dams and an Eskom Transmission line. There is a small network of roads on the farm, but most of the farm is still inaccessible without the use of four wheel drive vehicles or motorcycles. The farm is subdivided into camps and the border fences are well maintained. There are cattle handling facilities on the farm, but not on the proposed development site.

The access roads to the farm are in superb condition, both from the N14 to the south and Augrabies to the east. This facilitates comfortable transportation of livestock and other agricultural necessities and supplies to and from the farm. However, the farm is very far from the primary markets, which complicates the economical export of agricultural products from the farm.



Figure 9: Existing fence



## **10. Surrounding Activities**

The farm is mainly surrounded by other livestock farms and Southern Farms, a farm that cultivates vineyards under irrigation, borders Skuitdrijf to the north. The north-eastern border of the farm is along the Orange River.

## **11. Water**

There are two primary water sources on the farm, namely rainwater and groundwater. The average annual rain is approximately 100mm. There are no rivers or significant dams on the farm. Groundwater is readily available and of high quality, perfect for human and animal consumption. There are three boreholes on the farm which are utilised by means of windmills. The water is currently accumulated in two small reservoirs and is only used to supply the livestock of drinking water.

## **12. Possible Land Use Options**

Agriculture is one of the predominant land uses in Northern Cape. Due to the severe climatic limitations in the study area there is no dry land arable potential on the farm. The only possible agriculture potential is for the most extensive type of sheep grazing.

The combination of poor soil quality, water scarcity and distance from the market hinders the possibility of the commercial production of grain, vegetables and horticultural products. Irrigation on this dry and arid area is excluded due to low availability of water.

It is possible to consider game farming in the area, especially Springbok and Gemsbok, but the capital expenditure would be extremely high.

The proposed site does not have any agricultural value and has not for many years been utilized for any extensive agricultural purposes. The site is too small to generate noteworthy financial benefit from agricultural activities.

## **13. Impact of the Change of Land Use on the Surrounding Area**

The property is currently being used for limited grazing. The development of the proposed solar facility will not have a significant impact on the agricultural potential of the farm. Less than 20ha of grazing field will be lost, which is very small. The economic benefits that the proposed development holds cannot be recovered from the current or potential agricultural activities.

## **14. Conclusion**

It is clear that the proposed development will not have a negative impact on the property due to the low agricultural potential. The low agricultural potential of the site can be ascribed to a combination of the geology, climate and vegetation. The proposed site is not economically productive, mainly due to the extreme nature of the climate and the low potential of the soil. The general recommendation is that the site should not be used for agricultural production but it should be made available for the development of the 10MW PV solar power facility.

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