

**Appendix D5: Updated Socio-economic Assessment/Addendum  
(2017 revision)**

**Socio- Economic Impact Assessment of Amended 2017 Solar Energy Facility Daniëlskuil,**  
For  
**Roma Energy Daniëlskuil (Pty) Ltd**  
In support of the Environmental Basic Assessment Report by Enviro Africa, Helderberg.



Reports

Preliminary SEI	March 2012
SEI	May 1012
SEI of Amended Proposal	March 2017

## Executive Summary

In 2012 EnviroAfrica cc, was appointed by Roma Energy Daniëlskui (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Erf 753 (Portion of Erf 1), Daniëlskui in accordance with the Environmental Management Act, 1998 (Act no 107 of 1998), as amended and the Environmental Assessment Regulations, 2010. Leap Sustainable Development was appointed to undertake the specialist socio-economic impact assessment as part of the BAR. The reports generated in this round were a Preliminary Socio-economic Impact Assessment and a Socio-economic Impact Assessment.

The Environmental Authorizations granted lapsed and applications have to be made afresh. This report represents a Socio- Economic Impact Assessment of the amended 2017 Solar Energy Facility Proposal, Daniëlskui.

## Purpose

This report assesses

- a) the amended application to accommodate any changes that may come about since the original assessment and
- b) The cumulative impacts as required by DEAT.

## Approach

The assessment is done by

- a) Comparing development proposals in 2011 – 2012 with development proposals in 2017. The impact of the differences, if any, is then evaluated and mitigation measures are proposed.
- b) Evaluating cumulative impacts as per DEAT's requirements.

## Comparison between 2012 and 2017 proposal

Changes in the 2017 proposal are tabulated below and can be summarized as follows:

- a) Different technology is used (Crystalline photovoltaic instead of concentrated photovoltaic)
- b) Less energy will be generate (5MW instead of 10 MW)
- c) Downscaling in size of infrastructure

No downscaling in extent of the facility.

## Impacts and Cumulative impacts during the Construction, Operational and Decommissioning Phases:

The significance and intensity of impacts during the **construction phase** stays the same as in 2012 should the proposed mitigation measures be applied.

The significance and intensity during the **operational phase** stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results for both the construction and operational phase:

- a) The community will experience positive changes in their economic and material well-being as
- More job and job opportunities will be generated.
  - Skills levels will increase
  - the local economy will improve (increased sales and contribution to GGP)
- b) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:
- Construction phase:
- The roads as there are more slow moving vehicles using the road (R31).
  - Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
  - Living environment as increased dust and noise levels will decrease air quality.
  - Community resources: archaeological, palaeontological and sense of place.
- Sense of Place: This impact is of a temporary nature.  
Palaeontologically the current losses of Precambrian fossil heritage can be set against the probable widespread occurrence of stromatolitic beds in the subsurface of the extensive Ghaap Plateau (i.e. unique fossil heritage is not highly threatened). Furthermore, mining and other bedrock excavations may provide access for palaeontologists to previously inaccessible stromatolite beds. A premium should be set on the conservation of surface exposures of well-preserved stromatolites since partial surface weathering usefully enhances many of the stromatolitic features for scientific study (cf Almond 2015).
- Operational phase
- Authority and municipal services as the likelihood of fires and theft of livestock and increase in noise levels during decommissioning (although temporary) may be more likely.
  - Community resources: archaeological, palaeontological and sense of place.
- The Sense of Place is unlikely to change as the proposed development is located within the urban edge. However to avoid potential glare visible from R31 southbound, provide soft screening along road of 1,2 -1,8m in height.
- c) The community will experience the following environments to be under stress and mitigation is not obvious:
- The employment sector as more people will migrate into Daniëlskuil looking for work. However, the in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does

### Conclusion

The impacts of the 2017 Proposal is similar and overall positive after mitigation as proposed in 2011 as the development is located within the urban edge of the Daniëlskuil amongst other utility and industrial uses.

The cumulative impacts are positive, or can be mitigated to support the positive impacts. Whilst cumulative impacts of renewable energy facilities are unlikely on palaeontological resources, the cumulative impact of mining should be noted. The in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

The Northern Cape Economic Potential and Investment Profile, 2012 highlights the energy sector as one of the sectors to enhance the socio-economic circumstances of the Northern Cape. Moreover, the carbon footprint to generate electricity will get reduced.

The proposed development is therefore supported from a socio-economic perspective.

## **Background**

In 2012 EnviroAfrica cc, was appointed by Roma Energy Daniëlskuil (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Erf 753 (Portion of Erf 1), Daniëlskuil in accordance with the Environmental Management Act, 1998 (Act no 107 of 1998), as amended and the Environmental Assessment Regulations, 2010. Leap Sustainable Development was appointed to undertake the specialist socio-economic impact assessment as part of the BAR. The reports generated in this round were a Preliminary Socio-economic Impact Assessment and a Socio-economic Impact Assessment.

The Environmental Authorizations granted lapsed and applications have to be made afresh. This report represents a Socio-Economic Impact Assessment of the amended 2017 Solar Energy Facility Proposal, Daniëlskuil.

## **Purpose**

This report assesses

- c) the amended application to accommodate any changes that may come about since the original assessment and
- d) the cumulative impacts as required by DEAT.

## **Approach**

The assessment is done by

- c) Comparing development proposals in 2011 – 2012 with development proposals in 2017. The impact of the differences, if any, is then evaluated and mitigation measures are proposed.
- d) Evaluating cumulative impacts as per DEAT's requirements.

## **Amended Proposal (2017)**

Roma Energy Daniëlskuil (Pty) Ltd intends to construct a 5 MW solar photovoltaic (PV) energy generation facility on Erf 753 (Portion of Erf 1), Daniëlskuil, Kgatelopele Local Municipality, Northern Cape. The proposed energy generation facility is situated east of the R31 connecting Daniëlskuil to Douglas and directly east of the existing Idwala limestone mine on the southern outskirts of Daniëlskuil. Erf 753 (Portion of Erf 1) is owned by Idwala Industrial Holdings (Pty) Ltd. The land is zoned Undetermined.

The proposed development entails the construction of about 18540 PV solar panels with a footprint of less than 20 ha. The PV panels will be mounted on pedestals drilled and set into the ground. Associated infrastructure includes a perimeter access road, single track internal access roads, trenches for underground cables, 2 to 4 transformer pads, a switching station, a maintenance shed, and a temporary construction camp. The Ouplaas 132/22kV substation is situated on site.

## **Comparison between 2012 and 2017 proposal**

Changes in the 2017 proposal are tabulated below and can be summarized as follows:

- d) Different technology is used (Crystalline photovoltaic instead of concentrated photovoltaic)
- e) Less energy will be generate (5MW instead of 10 MW)
- f) Downscaling in size of infrastructure

No downscaling in extent of the facility.

Elements	2012 Proposal	2017 Proposal	Result
- Technology Type	- concentrated photovoltaic (CPV) - uses Fresnel lenses to concentrate light from sun onto individual PV cells	Solar Photovoltaic, Crystalline PV	Different Technology
- Capacity	- 10MW, - A single solar generator produces $\pm 66kV$ . A number of generators arranged in multiple/ arrays produce 10MW	5MW, 18540 solar modules 927 Modules strings (a string constitutes a number of modules connected to a common inverter)	Less (half) energy generated
- Inversion and inverters	- An inverter is used to convert direct current electricity produced into alternating current in order to connect to ESKOM grid	3 inverter stations (inverters to keep generation of energy at 5MW or below). A total of 7 central inverters will be used.	None
- Specifications/ Scale & Mass	- CPV panels will be elevated 2m above ground supported by a structure and track path of the sun during the day for maximum efficiency	Single axis unit. Elevated $\pm 1.5m$ above ground	Shorter axis, down scaling of size of infrastructure
	- Approximately 1.8ha is required to install 1MW. (Thus 10MW require 20ha)	Extent of the development stays the same	Smaller take up but extent of the development stays the same
	- Each panel will be approximately 17-22m wide by 12.5m high. When panels are tracking vertically the structure will have a maximum height of approximately 15,64m.	Module: 1.956m x 0.992m Module String 20 x 1.956m x 0.992m = $\pm 40m \times \pm 20m$ Height tracking vertically $\pm 10.5m$	Maximum height lower
- Mounting	- CPV panels will be mounted on pedestals drilled and set into the ground.	Same	None
- Preparation of land to assemble stands	- Extensive bedrock excavations are not envisaged, but some vegetation will need to be cleared from the site.	Excavations for footings are 1.5m in diameter	None
- Associated Infrastructure	- Single track internal access roads, trenches for underground cables, transformer pads, a switching station, a maintenance shed, and a temporary construction camp on site (containers will be used as sheds)	A perimeter access road, single track internal access roads, trenches for underground cables, 2 to 4 transformer pads, a switching station, a maintenance shed, and a temporary construction camp	None
- Transmission & Substation	- General: Electricity generated will be fed into the national grid at an Eskom substation: Ouplaas substation	Ouplaas substation is on site	None
- Access	- Site will be accessed from N14, using existing secondary roads. Additional temporary access roads will be established on site.	Site will be accessed from N14.	None
- Location, Ownership, extent	- to be established on 20ha of land on Erf 753 (Portion of Erf1), Daniëlskuil	10h to be established on 20ha of land on Erf 753 (Portion of Erf1), Daniëlskuil owned by Idwala Industrial Holdings (Pty) Ltd, zoned Undetermined.	None
- Changes in	The area for the proposed PV facility is	No changes occurred in receiving	None

receiving environment	flat and featureless comprising a mix of old grazing land, bush and degraded grassland vegetation. There are no streams, pans, or natural sources of water. Several large overhead powerlines feed into Ouplaas substation and internal access roads are on site. Surrounding land uses are Idwala Lime Mine, Daniëlskuil Waste Water Treatment Works (WWTW) north east of site, and vast tracts of agricultural land.	environment which impact on the original assessment. Sensitive receptors (monument & residential areas) not exposed to site, intrusion level low. Potential glare visible from R31 southbound.	
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### Impacts and Cumulative impacts during the Construction, Operational and Decommissioning Phases:

#### Summary of impacts during the Construction Phase

The impacts identified in the 2012 assessment, have low levels of significance. Where negative, mitigation could keep the levels of significance low or could reverse the impact to become neutral.

The 2017 proposal (different technology, less energy generate, downscaled infrastructure but development footprint stay the same) is compared and evaluated.

The same is done for the cumulative impacts.

The table below lists all the impacts identified during the construction phase, their significance (low or high) and intensity (positive or negative) before and after mitigation:

Impacts	Related Impact	Preferred Alternative 2011	Preferred Alternative 2011 mitigated	Proposal 2017 (2011 mitigation measures)	Cumulative (within 30km)
More jobs / increase in job opportunities will be generated	- Low skills level may cause an influx of job seekers, some loss of community safety	Low, positive	Low, positive	Low positive	Medium positive (job creation)
	- Influx of people			Insignificant	Medium negative
Increase skills levels (changes in economic and material well-being)	- Skills development, training and capacity building locals may not benefit as "others" may be employed	None	Low, positive	Low, positive	Medium, positive
Reduced road safety	- Less than 50 trips per day (stock & workers). - Slow moving vehicles may cause intersection to be less safe - Heavy vehicles may cause deteriorating road surfaces	Low, negative	Neutral	Neutral	Medium Negative
Local resources (i.e. clinic) & services under stress.	- Increased demand for municipal and authority services	Insignificant	Insignificant	Insignificant	Low, negative
Decrease Health and Social Well being	Dust and noise levels raise	Medium, negative	Low, negative	Low, negative	Low negative
Increased sales and contribution to GGP		Low, positive	Low, positive	Low, positive	Medium positive

Community Resources (and tourist attractions) under stress	Archaeological Resources: no archaeological remains were recorded.	Low	Low	Low	Low Four renewable energy (RE) projects planned: Do not impact on archaeological resources.
	Palaeontology Resources: Occurrence of stromatolites and other microbial fossils in Precambrian bedrocks. The fossiliferous Precambrian bedrocks are largely mantled here by superficial sediments (e.g. wind-blown sands) of low palaeontological sensitivity. Good surface exposures of stromatolitic limestone are not present here.	Low	Low	Low	Moderately high Cumulative impacts on fossil stromatolite occurrences within Campbell Rand Subgroup in Daniëlskuil region are likely to be already moderately high due to large-scale mining here. Additional potential losses of fossil heritage posed by construction of Daniëlskuil Roma solar plant are unlikely to be significant.
	Sense of Place	Temporary, Low		Temporary, Low	Temporary, Medium

The significance and intensity of impacts during the construction phase stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results:

- d) The community will experience positive changes in their economic and material well-being as
- More job and job opportunities will be generated.
  - Skills levels will increase
  - the local economy will improve (increased sales and contribution to GGP)
- e) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:
- The roads as there are more slow moving vehicles using the road (R31).
  - Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
  - Living environment as increased dust and noise levels will decrease air quality.
  - Community resources: archaeological, palaeontoligical and sense of place.  
Sense of Place: This impact is of a temporary nature.  
Palaeontologically the current losses of Precambrian fossil heritage, due to mining can be set against the probable widespread occurrence of stromatolitic beds in the subsurface of the extensive Ghaap Plateau (*i.e.* unique fossil heritage is not highly threatened). Furthermore, mining and other bedrock excavations may provide access for palaeontologists to previously inaccessible stromatolite beds. A premium should be set on the conservation of surface exposures of well-preserved stromatolites since partial surface weathering usefully enhances many of the stromatolitic features for scientific study (*cf* Almond 2015).

- f) The community will experience the following environments to be under stress and mitigation is not obvious:



- The employment sector as more people will migrate into Daniëlskuil looking for work. However, the in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

### Operations and Demolition

The impacts identified in the 2012 assessment, have low levels of significance. Where negative, mitigation could keep the levels of significance low or could reverse the impact to become neutral.

The 2017 proposal (different technology, less energy generate, downscaled infrastructure but development footprint stay the same) is compared and evaluated.

The same is done for the cumulative impacts.

The table below lists all the impacts identified during the construction phase, their significance (low or high) and intensity (positive or negative) before and after mitigation:

Impacts		Preferred Alternative 2011	Preferred Alternative 2011 mitigated	Proposal 2017 (2011 mitigation measures)	Cumulative
More jobs / increase in job opportunities will be generated	- Low skills level may cause an influx of job seekers, some loss of community safety	Low, positive	Low, positive	Low positive	Medium positive (job creation)
	- Influx of people			Insignificant	Medium negative
Increased skills levels (changes in economic and material well-being)	- Skills development training and capacity building in cleaning & maintenance	Low, positive	Medium, positive	Medium, positive	Medium, positive
Reduced road safety	- Increased traffic below threshold of 50 trips per day (security & maintenance).	Low, negative	Neutral, insignificant	Neutral, Insignificant	Neutral, insignificant
Decrease health & social well-being	- Fire hazard - Livestock get stolen (perception security staff steal live stock) - Noise during decommissioning: short term, safety as per international standards.	Low, negative	Low, negative	Low, negative	Low, negative
Increased sales and contribution to GGP		Low, positive	Low, positive	Low, positive	Medium positive
Sense of place change (changes in quality of living environment)	- Visual landscape and environment will change - Ouplaas Eskom substation, overhead powerlines, service roads, and Waste Water Treatment Works, Idwala Lime Mine adjacent (utility type of land uses and is within the urban edge	Low, negative	Low, negative	Low, negative: To avoid potential glare visible from R31 southbound, provide soft screening along road of 1,2 - 1,8m in height. Sensitive receptors (monument &	Low non-significant impact at acceptable levels. (screened from R385, only exposed to R31, no other sites located on this route). Low non-significant impact at acceptable levels. Four

	in an industrial area). Development seems to be in character with surrounding uses.			residential areas) not exposed to site, intrusion level low	renewable energy projects planned, R385 traverses proposed sites (direction Postmansburg).
Enhanced tourism causing changes in economic and material well being	Palaeontology Resources: Occurrence of stromatolites and other microbial fossils in Precambrian bedrocks. Good surface exposures of stromatolitic limestone are not present here	Low	Low	Low	Cumulative impacts on fossil stromatolite occurrences within Campbell Rand Subgroup in Daniëlskuil region are likely to be already moderately high due to large-scale mining here

The significance and intensity during the operational phase stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results:

- g) The community will experience positive changes in their economic and material well-being as
  - More job and job opportunities will be generated.
  - the local economy will improve (increased sales and contribution to GGP)
- h) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:
  - Authority and municipal services as the likelihood of fires and theft of livestock and increase in noise levels during decommissioning (although temporary) may be more likely.
  - Community resources: archaeological, palaeontolical and sense of place.  
The Sense of Place is unlikely to change as the proposed development is located within the urban edge. However to avoid potential glare visible from R31 southbound, provide soft screening along road of 1,2 - 1,8m in height.
- i) The community will experience the following environments to be under stress and mitigation is not obvious:
  - The employment sector as more people will migrate into Daniëlskuil looking for work. However, the in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

**Conclusion**

The impacts of the 2017 Proposal is similar and overall positive after mitigation as proposed in 2011 as the development is located within the urban edge of the Daniëlskuil amongst other utility and industrial uses.

The cumulative impacts are positive, or can be mitigated to support the positive impacts. Whilst cumulative impacts of renewable energy facilities are unlikely on palaeontological resources, the cumulative impact of mining should be noted. The in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

The Northern Cape Economic Potential and Investment Profile, 2012 highlights the energy sector as one of the sectors to enhance the socio-economic circumstances of the Northern Cape. Moreover, the carbon footprint to generate electricity will get reduced.

The proposed development is therefore supported from a socio-economic perspective.

#### **References**

ACRM, 2017: Archaeological Impact Assessment: The proposed Roma Energy Daniëlskuil Solar Energy Farm on Erf 753 (Potion of Erf 1), Daniëlskuil, Northern Cape.

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Leap Sustainable Development, 2012: Socio Economic Impact Assessment: Daniëlskuil Photovoltaic Electricity Generation Facility

Natura Viva cc. 2017: Recommended exemption from further palaeontological studies & mitigation: Proposed Daniëlskuil Roma Energy Solar Plant, Kgatelopele Local Municipality, Northern Cape

PB Consult: Ecological & Botanical management services, 2017: Addendum to the biodiversity assessment & biodiversity assessment & botanical scan, for the Daniëlskuil Solar project:

**Appendix D5: Socio-economic Assessment  
(Original report)**

**Socio-Economic Impact Assessment**  
**For**  
**Roma Energy Danielskuil (Pty) Ltd**  
**Photovoltaic Electricity Generation Facility,**  
**Danielskuil**  
**Basic Environmental Assessment Report**



March 2012

by



## Executive Summary

Kgatelopele Municipality is home to the proposed 10MW photovoltaic electricity generation facility on Erf 753, Danielskuil. In Kgatelopele Municipal area and Danielskuil, the majority of people work in un- and semi-skilled jobs as thirty eight percent (38%) of the population of Kgatelopele is unskilled, 55% semi-skilled and 7% highly skilled. Whilst the unemployed rate in Kgatelopele is 38%, well over 80% of households earn R3500 and less per month.

This socio-economic assessment, based on a basic model which could be changed to have overall better outcomes, identified the following impacts during the Construction, Operational and Decommissioning Phases:

### **Positive Impacts:**

Impacts causing positive changes of low and medium significance to the economic and material well being of the community after being amplified by mitigation are:

#### **a) Job creation:**

The construction and decommissioning of the proposed photovoltaic electricity facility has an impact of low positive significance whilst its operation has a medium positive significant impact as summarised in the table below:

New employment opportunities, Construction phase	30 jobs over 6-8 months
Expected value of employment opportunities, Construction phase	±R3 million (R2 million for 8 months)
% of value of employment accrued to Previously Disadvantaged Individuals, Construction phase	40-45%
Number of permanent employment opportunities, Operational Phase	10 (7 direct & 3 indirect)
Expected current value of employment: first 10 years, Operational phase	R8.7 million
Percentage of expected current value accrued to PDI, Operational phase	56% (R4.9million)

The unemployment rate for the Northern Cape and Kgatelopele Municipal Area is 26% and 38% respectively.

**b) Increase in Sales volume and sustainable municipal income:**

The construction and decommissioning of the proposed photovoltaic electricity facility has an impact of low significance whilst its operation has a impact of high positive significance given the long term rental agreement between Roma Energy Kakamas (Pty) Ltd and Kai !Garieb municipality.

**c) Increase in GGP:**

The GGP will increase slightly during the construction, operation and decommissioning phases. The impact of the proposed photovoltaic electricity facility is low positive in significance during construction, operations and decommissioning but is medium high positive in significance during operations given the long term lease agreement between Roma Energy Kakamas (Pty) Ltd and Kai !Garieb municipality. The table below provides the contributions during construction and operation.

Expected capital expenditure (Construction)	R308.8 million per 10 MW
Expected yearly income (Operation)	R65 million per annum

**d) Growth in Tourism:**

It is anticipated that the operation of a photovoltaic facility will attract tourists. Business visitors will be interested in the facilities and cause more people to visit Danielskuil than previously. The impact of the proposed photovoltaic facility is low positive in significance during construction and operations.

**e) Skills development:**

The employment model applied (an external construction team and a roaming cleaning and maintenance team) cause the impact of skills development to be low but positive in significance before and after mitigation. Most of the skills will be developed through on-the-job-training, hence the rating stays low.

The Kgatelopele population has a corresponding low level of education: Thirty eight percent (38%) of the population of Kgatelopele is unskilled, 55% semi-skilled and 7% highly skilled.

***Negative Impacts that can be neutralized or reversed:***

Impacts that initially cause negative changes of low significance to a) the living environment of and b) the health and social well being of the community during all three phases but are either neutralized or reversed to be positive, are:

- f) An increase in traffic which has been assessed to be low negative during construction and decommissioning given the slow moving vehicles but through mitigation can be neutralized. The impact is unlikely to occur during operations.
- g) An increase in dust and noise (health & safety) which has been assessed as of low negative significance during the construction and decommissioning phases but through mitigation can be neutralized. The impact of dust and noise will be unlikely in the operational phase.

Fires could threaten safety during construction and decommissioning, but mitigation and the location of the proposed site neutralise such an impact.

Impacts on health and safety are unlikely during operations.

- h) Increased demand for municipal services i.e. health service. The demand for the said services may occur sporadically during the construction and decommissioning phase, but given the employment model applied (an external construction team and a roaming cleaning and maintenance team) the impact is likely but of very low significance. Mitigation measures neutralises the impact on municipal amenities.

Additional pressure on the supply of domestic services is unlikely. However should it occur it will be sporadic and the significance of the impact will be low.

***Negative Impacts that cannot be reversed:***

Impacts that cause negative changes of low significance to the living environment of the community and cannot be mitigated, are:

- i) a change to the sense of place. Despite the location, surrounding land uses (mining) and hence the absorption capacity of the site environment, the intensity and thus significance is during construction, operations and decommissioning is low but negative. Only after decommissioning the impact will be neutralized.

Overall the impacts are positive or are neutralized or reversed to positive and their significance is low to medium. Mitigation measures amplify these impacts.



### ***Need and Desirability***

The need for and desirability of the proposed 10 MV Roma Energy Danielskuil (Pty) Ltd Photovoltaic Electricity Generation Facility on Erf 753, Danielskuil is confirmed by

a) the Northern Cape Provincial Spatial Development Strategy (NCSDS) as

- *Economies of emerging growth centres, i.e. Upington & Springbok, are diversified (balancing downscaling of export grapes and copper mines industries with growth prospects in non-traditional sectors i.e. energy generation);*
- *Proximity of land reform sites to economic activities should be ideal as economic potential of land reform sites are inadequate. Alternative energy generation enhances economic activity and potential of land reform sites;*
- *Development Corridors and Special Resource Areas i.e. Orange River corridor (from Springbok through Upington to Kimberley) link the major economic centers in the province through established transport infrastructure. Alternative energy projects are examples of flagship economic development projects along transport/ development corridors and within special resource areas enhancing economic potential of development corridors;*
- *Stagnating Small Towns will lead to reconsideration of future service provision levels; Alternative energy generation can contribute to sustainable municipal income, enabling the municipality to maintaining and develop services.*

Desirability of the proposed photovoltaic electricity generation facility is supported by:

- the acceptable level of change in the sense of place given the surrounding land uses (mining) and hence absorption capacity of the environment;
- no need to build long distances of high voltage lines as Eskom substation is on the terrain;
- Most impacts are rated as either of low positive significance or can be reversed to be neutral or positive.
- Overall, the carbon footprint to generate electricity will get reduced, whilst the Northern Cape Economy and the community of Kgatelopele Local Authority will benefit from proposed photovoltaic electricity generation facility.

Desirability of the proposed photovoltaic electricity generation facility is also supported by the ability of the environment to absorb the changes in the sense of place as the surrounding land

uses are industrial (mining). All remaining impacts are either of low positive significance or can be reversed to become neutral. Overall, the carbon footprint to generate electricity will get reduced, whilst the Northern Cape Economy and the community of Kgatelopele Local Authority will benefit from proposed photovoltaic electricity generation facility.

### **Conclusion**

The socio-economic assessment, based on a basic model which could be changed to have overall better outcomes, reveals that the positive impacts can be amplified whilst negative impacts can be reversed through appropriate mitigation measures. A summary of impacts are listed below reflecting that most impacts are of low significance:

<b>Impacts during Construction</b>	<b>Alternative: Preferred Sig/ Intensity</b>		<b>Alternative: Preferred Mitigated</b>		<b>Alternative: No Go</b>
<b>Job creation</b>	Low, positive	8	Low, positive	12	No impact
<b>Skills development</b>	Low, positive	6	Low, positive	9	No impact
<b>Traffic</b>	Low, negative	8(-)	Low, positive - neutral	8	No impact
<b>Municipal services</b>	Low, negative	3(-)	Low, positive - neutral	4	No impact
<b>Health</b>	Low, negative	10(-)	Low, negative – neutral	4(-)	No impact
<b>Safety</b>	Low, negative	10(-)	Low, negative – neutral	4(-)	No impact
<b>Sales volume</b>	Low, positive	8	Low, positive	12	No impact
<b>GGP contribution</b>	Low, positive	15	No mitigation measures	-	No impact
<b>Impacts: Operations &amp; Decommissioning</b>	<b>Alternative: Preferred</b>		<b>Alternative: Preferred Mitigated</b>		<b>Alternative: No Go</b>
<b>Job creation</b>	Low, positive	30	Medium, positive	45	No impact
<b>Skills development</b>	Low, positive	6	Low, positive	9	No impact
<b>Traffic</b>	Unlikely		-		No impact
<b>Municipal services</b>	Unlikely		-		No impact
<b>Health &amp; Safety (operations)</b>	Low, negative	7(-)	Low, negative-neutral	4(-)	No impact
<b>Health &amp; Safety (decommissioning)</b>	Low, negative	16(-)	Low, negative - neutral	10(-)	No impact
<b>Sales volume</b>	Low, positive	30	Medium-high, positive	45	No impact
<b>GGP contribution</b>	Low, positive	45	No mitigation	45	No impact
<b>Sense of place</b>	Low, negative	9(-)	Low, negative	9(-)	No impact
<b>Tourism</b>	Low, positive	16	Low, positive	16	No impact

With the benefits of job creation, strengthening tourism, a reduced carbon footprint and clean energy, the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility should be approved on condition that the proposed mitigation measures are implemented.

**Roma Energy Danielskuil (Pty) Ltd Photovoltaic Electricity Generation Facility,  
Danielskuil**

**Socio- Economic Impact Assessment**

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<b>Index</b>	<b>Page</b>
<b>Chapter 1: Overview of Proposed Development and Socio-economic Impact Assessment Approach .....</b>	<b>9</b>
1.1 Introduction .....	9
1.2 Description of the Proposed Development .....	9
1.3 Development Alternatives .....	12
1.4 Approach .....	12
1.5 Assumptions and limitations .....	13
1.5.1 Assumptions.....	13
1.5.2 Limitations .....	13
1.6 Specialist Details.....	14
1.7 Declaration of Independence .....	14
1.8 Report Outline.....	14
 <b>Chapter 2: Description of the Area of Study .....</b>	 <b>15</b>
2.1 Introduction .....	15
2.2 Policy and Planning Context .....	15
2.2.1 White Paper on Energy Policy for the RSA (1998) .....	16
2.2.2 White Paper on Renewable Energy (2003) .....	16
2.2.3 National Energy Act (2008) .....	17
2.2.4 National Alternative Energy Strategy .....	17
2.2.5 National Spatial Development Perspective, 2006 (NSDP).....	17
2.2.6 Northern Cape Provincial Spatial Development Strategy (NCSDS) .....	18
 <b>Chapter 3: Impacts identified during the Construction Phase .....</b>	 <b>21</b>
3.1 Assessment .....	21
3.1.1 Extent.....	21

3.1.2	Duration .....	21
3.1.3	Intensity.....	22
3.1.4	Probability .....	22
3.1.5	Significance.....	22
3.2	Impacts identified during the Construction Phase.....	23
3.1.1	Increased Jobs.....	24
3.1.2	Skills development, training and capacity building .....	26
3.1.3	Increase in traffic.....	27
3.1.4	Increased use of Municipal and Authority Services .....	28
3.1.5	Decreased Health .....	30
3.1.6	Increased Sales .....	31
3.1.7	Increased GGP .....	33
3.3	Summary of impacts during the Construction Phase .....	34
Chapter 4:	Impacts identified during the Operational Phase .....	35
4.1	Increased Jobs .....	35
4.2	Skills development, training and capacity building .....	36
4.3	Increase in traffic .....	37
4.4	Increased use of Municipal and Authority Services including housing.....	37
4.5	Decreased Health and Safety.....	37
4.6	Increased Sales.....	39
4.7	Increased GGP.....	41
4.8	Sense of place (and surrounding properties) .....	42
4.9	Tourism .....	43
4.10	Summary of impacts during the Operational Phase .....	43
Chapter 5:	Management guidelines to address socio-economic impacts.....	45
5.1	Skills development.....	45
5.2	Preferential procurement policies.....	47
5.3	Enhancing the sense of place.....	48
5.4	Conclusion.....	49
Bibliography .....		48

## Figures & Tables

Figure 1: Location of the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Project .....	9
Figure 2: Topography of Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Site .....	11
Table 1: Impact of job creation: Construction Phase .....	24
Table 2: Impact of skills development, training and capacity building: Construction Phase .....	26
Table 3: Impact of Traffic: Construction Phase.....	28
Table 4: Impact of services demand: Construction Phase.....	28
Table 5: Impact of dust and noise: Construction Phase.....	30
Table 6: Impact of Sales: Construction Phase.....	31
Table 7: Impact of GGP: Construction Phase.....	33
Table 8: Impact of job creation: Operational Phase.....	35
Table 9: Impact of skills development, training and capacity building: Operational Phase.....	36
Table 10: Impact of health and safety hazards: Operational Phase.....	
Table 11: Impact of Sales: Construction Phase.....	37
Table 12: Impact of GGP: Construction Phase.....	39
Table 13: Visual Impact: Operational Phase .....	42
Table 14: Impact of and on tourism: Operational Phase.....	44

## Chapter 1:

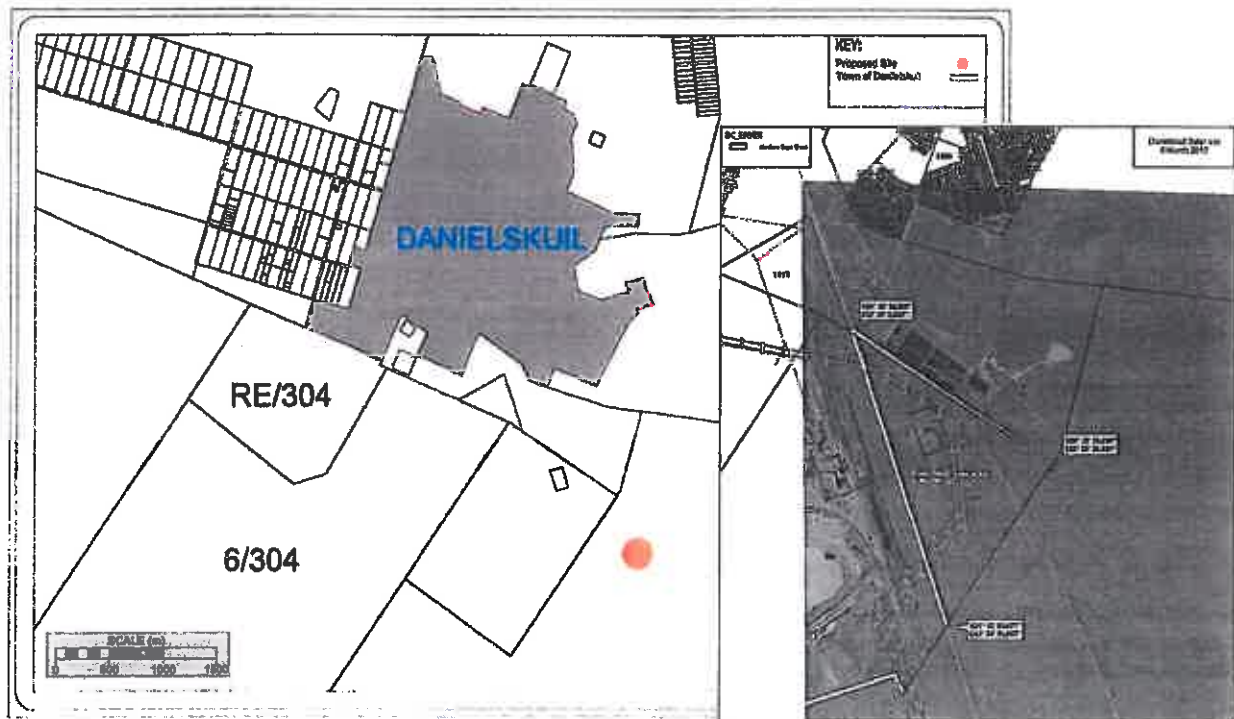
### Overview of Proposed Development and Socio-economic Impact

#### 1.1 Introduction

EnviroAfrica cc, was appointed by Roma Energy Danielskuil (Pty) Ltd to undertake an Environmental Basic Assessment (EBA) for a proposed Photovoltaic Energy Electricity Generation Facility on a portion of Erf 753, Danielskuil. Leap Sustainable Developments were appointed to undertake a specialist Social Impact Assessment (SIA) as part of the EIA. This report constitutes a Socio-Economic Impact Assessment.

#### 1.2 Description of the Proposed Development

Roma Energy Danielskuil (Pty) Ltd is proposing the establishment of a 10MW concentrated photovoltaic solar energy facility near the town of Danielskuil, Kgatelopele Municipality, Northern Cape Province. The solar facility is proposed to be located on Erf 753, Danielskuil, approximately 2.2 km south-east of Danielskuil (directly across from the Idwala Lime Mine) (See Figure 1&2).



**Figure 1:** Location of the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Facility, Danielskuil

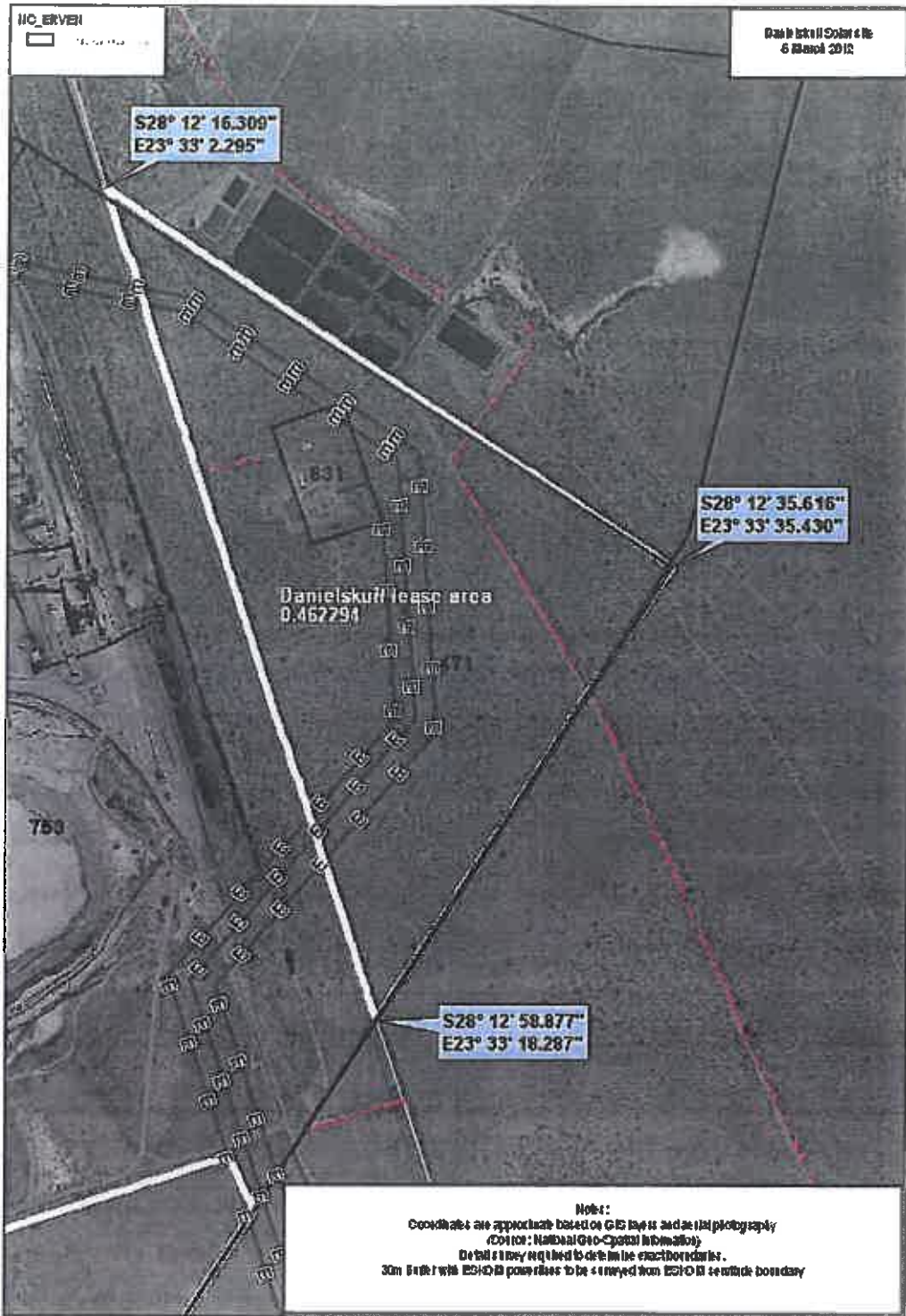
The proposed Photovoltaic Energy Generation Facility will utilise Concentrated Photovoltaic (CPV) technology. CPV uses Fresnel lenses to concentrate the light from the sun onto individual PV cells. An inverter is then used to convert the direct current electricity produced into alternating current in order to connect into the Eskom grid.

A single solar generator produces approximately 66kV. To produce 10 MW, the proposed facility will require a number of generators arranged in multiples/arrays. The CPV panels will be elevated 2m above ground by a support structure, and will be able to track the path of the sun during the day for maximum efficiency. Approximately 1.8ha is required per installed MW. A 10MW capacity facility and its associated infrastructure will thus require a development footprint of approximately 20 ha. Each panel will be approximately 22m wide by 12.5 m high. When the panels are tracking vertically the structure will have a maximum height of approximately 15m (Botes, p4). The CPV panels will be mounted on pedestals drilled and set into the ground. Extensive bedrock excavations are not envisaged, but some vegetation will need to be cleared from the site.

Associated infrastructure includes single track internal access roads, trenches for underground cables, transformer pads, a switching station, a maintenance shed, and a temporary construction camp on site. Construction workers will be temporary housed in in Danielskuil. Some materials will be stored and the workshop will be housed in temporary containers on the construction site.

The electricity generated from the project will be fed directly into the national grid at the Eskom substation which is situated on the subject property (Kaplan, p4).

Danielskuil lies on the R31, approximately 85 km south of Kuruman and 60 km east of Postmasburg. The site will be accessed from the R31, using existing secondary roads.



Prepared by: Geostatics  
 March 2012  
 www.geostatics.co.za



Data Zoom 14-0

**Figure 2: Topography & Footprint of Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation site, Danielskuil**



### **1.3 Development Alternatives**

The Northern Cape has the highest levels of Solar Irradiance (~6kW/m<sup>2</sup>/day) in South Africa which is above the Solar Photovoltaic norm of >4.5kW/m<sup>2</sup>/day. The Northern Cape is therefore an ideal location of the proposed Photovoltaic Energy Generation Facility. The selection of a development site was further refined by the need to tap into an ESKOM line close to an ESKOM substation. The existing electrical infrastructure and substation on the site contribute to Erf 753, Danielskuil being selected as the preferred alternative.

Another alternative, the No-Go Alternative, should not be seen as an option as the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation facility:

- will generate jobs of which Kgetelopele Municipality is in much need of;
- will provide opportunities to obtain skills to the local community;
- will generate electricity of which South Africa is in need of.

### **1.4 Approach**

The approach to this study is directed by the requirements for Environmental Impact Assessments and the Guidelines for Social Impact Assessments (SIA) and Economic Impact Assessments commissioned by DEA&DP. Hence the following activities should be executed:

- Review of project information and preliminary specialist reports;
- Collection and synthesis of only the most critical baseline socio-economic data on the area;
- Identification project results and key social and economic variables, and the impact of the project results on the receiving society and economy as per Guidelines for Social Impacts;
- Verification of some results, social variables and impacts through communication with the developer, specialists and key project team members;
- Preliminary rating of the identified impacts as per rating criteria in Chapter 3;
- Preparation of preliminary Socio-Economic Impact Assessment Statement (SEIAS);

- Ascertain significance of impacts through a round of interviews and correspondence with registered interested and affected parties, other community members, specialists and key project team members.
- Rating the confirmed impacts as per recommended scale informed by the results of the interviews with various parties as outlined above.
- Recommending management measures to mitigate the impacts of the proposed development.

## **1.5 Assumptions and limitations**

### **1.5.1 Assumptions**

a) Complying with planning and policy requirements does not exempt the application from procedural requirements although the development is in line with national and provincial planning and strategy documents.

### **1.5.2 Limitations**

a) Assessment of alternatives is limited.

The alternatives assessed by the Socio- Economic Impact Assessment are limited to the proposed project site and the no-go alternative as the only alternatives.

b) Basic model subject to change.

A basic model which could be changed to have overall better outcomes, is the subject of this assessment. The model assessed, creates employment mainly regionally and represents larger structures that are highly visible vs. an altered model creating local employment and being less visible.

c) Demographic data is dated.

The demographic data used in the study is dated as it is based on the 2001 Census. However, the data does provide useful information on the demographic profile of the affected area. Other data used are more recent and comparisons reflect discrepancies.

d) The number of jobs created.

The number of jobs created was based on information from the developers and comparing those with other similar projects. The Social Accounts Matrix was not used.

e) Interviews with a limited group representing the mainly professionals involved in the project. Impacts recommended to be further assessed will include a number of people, not a representative sample, but those (interested and affected parties, key officials, some community members and business men) who can amplify the issues at hand.

### **1.6 Specialist Details**

The author of this report is an independent specialist with, 10 years experience in the field of rural development, 7 years in community education, 5 years in project management and coordination, 6 years in town and regional planning (A. Coetzee, Reg. no: A/1369/2010) and 6 years in socio-economic research.

### **1.7 Declaration of Independence**

This is to confirm that Anelia Coetzee, the consultant responsible for conducting the study and preparing the Preliminary and Final Socio Economic Impact Assessment Report, is independent and has no vested or financial interests in the proposed development being either approved or rejected.

### **1.8 Draft Report Outline**

The report is divided into the following sections:

- Section 1: Overview of Proposed Development and Social-Economic Impact Assessment;
- Section 2: Description of Related Policies and Area of Study;
- Section 3: Socio-Economic Impacts identified during the Construction Phase and assessment thereof;
- Section 4: Socio-Economic Impacts identified during the operational phase and assessment thereof;
- Section 5: Management guidelines to address socio-economic impacts.

## Chapter 2:

### Description of the Area of Study

#### 2.1 Introduction

This section of the report provides an overview of the baseline socio-economic conditions in the area that are relevant to the social and economic assessment of the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility. The baseline data was obtained through secondary data sources such as Statistics South Africa, 2001 National Census, Kgatelopele Municipality data and specialist studies. The baseline data provides the foundation to determine the impact of the development proposals.

The section is divided into the following sections, namely:

- Overview of the provincial planning context;
- Description of most critical social and economic context;

#### 2.2 Policy and Planning Context

The compatibility of the proposed development with the relevant land use planning policies and development plans for the area plays an important role when identifying and assessing potential social impacts. The following planning documents are relevant to the proposed development:

- White Paper on Energy Policy for the RSA (1998);
- White Paper on Renewable Energy (2003);
- National Energy Act (2008);
- National Alternative Energy Strategy (2009);
- National Spatial Development Perspective, 2006 (NSDP);
- Northern Cape Spatial Development Strategy;

##### 2.2.1 White Paper on Energy Policy for the RSA (1998)

The White Paper on Energy Policy for South Africa (December 1998) give recognition to "renewable *[that]* are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial

potential". "Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future". As South Africa has a very attractive range of renewable resources, particularly solar and wind, the fact that renewable applications are the least costly particularly when social and environmental costs are considered, is strongly emphasized.

The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Electricity Generation Project is in line with the principles of the White Paper on Energy Policy for South Africa as it promotes the use of renewable resources to generate energy.

### **2.2.2 White Paper on Renewable Energy (2003)**

As signatory to the Kyoto Protocol, Government is determined to, by means of the White Paper on Renewable Energy (November, 2003):

- a) make good the country's commitment to reduce greenhouse gas emissions and
- b) ensure energy security through diversification of supply (National Energy Act).

Government's long-term goal is to establish a renewable energy industry that will offer in future sustainable, fully non-subsidised alternatives to fossil fuels. The medium-term (10-year) target set in the White Paper is *10 000 GWh renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro electrical plants*. This target constitutes 4% of the total projected demand. The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Electricity Generation Project supports the medium and long term renewable energy government goals as it will assist to make good the country's greenhouse gas emissions and ensure energy security.

### **2.2.3 National Energy Act (2008)**

Again, the National Energy Act (Act 34 of 2008) promotes diversification of energy sources and supply including renewable resources, i.e. solar and wind. The diversified energy resources have to be available in sustainable quantities at affordable prices and

should support economic growth, poverty alleviation and consider the preservation of the environment.

The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Electricity Generation Project enhances energy source diversification is thus in line with the National Energy Act.

#### 2.2.4 National Alternative Energy Strategy

South Africa's government has identified around 20GW of pure renewable energy capacity and 4GW of co-generation technologies that may form part of its renewable energy procurement plan under the region's feed-in tariff programme. Concentrated solar power accounted ten percent (10%) of proposed capacity (NewsNet, 2010).

#### 2.2.5 National Spatial Development Perspective, 2006 (NSDP)

To National Spatial Development Framework serves as instrument to coordinate all government action and to align social, economic and environmental goals. The National Spatial Development Framework provides the basis to maximize the overall social and economic impact of government development investment through interpreting the strategic direction, policy coordination and combining government action into a continuous spatial framework of reference.

The ultimate goal is to provide basic services, to ameliorate poverty and undo uneven and ineffective spatial patterns and address the additional burden on poor people.

The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility complies with the normative principles of the National Spatial Development Framework as follows:

NSDF Principles	Proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility, Danielskuil
a) Economic growth is a prerequisite to achieve policy objectives;	The proposed project will contribute to the GGP of the province.

b) Government spending on fixed investment should therefore be focused on localities of economic growth or economic potential;	The Northern Cape has been earmarked by the National Government for the generation of alternative energy and in particular solar energy. The proposed project is located in the Northern Cape.
c) Efforts to address past and current social inequalities should focus on people not places.	The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation project could afford employees related training & skills development.
d) To overcome the spatial distortions of apartheid, future settlement and economic development opportunities should be channeled into corridors and nodes that are adjacent to or link the main economic growth centers;	The proposed facility will enhance the nodal status of Danielskuil enjoy due to the surrounding mining activities. .
e) Future urban and rural development in the province should change the current pattern of resource application and investment significantly to ensure a sustainable environment for the future. Infrastructure investment and development spending should primarily support localities that will become major growth nodes in South Africa	The resource application and investment are not only aligned with national energy strategies but with enhancing the resources of the Kgatelopele Municipality.

The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Project is in line with the principles of the National Spatial Development Framework as it promotes alternative energy generation and is in close proximity of the Orange River corridors promoting economic growth.

### **2.2.6 Northern Cape Provincial Spatial Development Strategy (NCSDS)**

The principles of the National Spatial Development Strategy inform the Northern Cape Provincial Spatial Development Strategy. The following strategic issue pertains to the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility:

#### ***Emerging Growth Centers:***

The two areas identified are Upington and Springbok and its surroundings. Balancing the downscale of export grapes and copper mines industries with the growth prospects in non-traditional sectors will be the focus. Hence significant rural-urban shift with some

stepwise (onward and outward) migration to other major centers both inside and outside the province may be experienced. This migration will place greater demand for services on local authorities who are not identified as growth nodes. Development priorities in these areas and Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility are aligned:

NCPSPDS Development priorities	Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility Development priorities
Promoting of emerging growth opportunities to absorb the employment needs of a growing population;	Promote alternative energy, an emerging industry in South Africa
Developing small and medium enterprises in emerging economic sectors;	The photovoltaic energy generation facility will provide opportunities for small and medium enterprises to offer their services to the facility.
Re-distribution of service provision to take into account the internal movement of people into these towns from other centers.	The project has a 30 year life span and it is likely to be repeated. Its permanency confirms the need for sustainable municipal services in Danielskuil.

**Land Reform Areas:**

Land re-distribution and security of tenure have led to the need to provide services in previously under or non-serviced areas. From a spatial development perspective the locality of these areas, that is under or non-serviced, will be a critical determinant for their future viability. Most of them are in areas in relatively close proximity to the Kimberley, Postmasburg and Upington areas. Although the proximity of land reform sites to economic activities is ideal, the economic potential of the land reform sites are inadequate as a source of economic livelihoods. Development priorities in these areas and the objectives of the Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility, are aligned:

NCPSPDS Development priorities	Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility Development priorities
Maximize local economic development opportunities;	The photovoltaic energy facility provides opportunity for local small business to be involved in the maintenance of the facility, maximizing the economic development opportunities.



Promote integration and linkages with the surrounding economy;	Danielskuil will be the projects economic base for day to day supplies and services. Upington or Kimberley will be the centre for services not supplied in Danielskuil.
Provide appropriate levels of services.	The project will support services in the area as the tax basis of the Danielskuil will increase.

***Development Corridors and Special Resource Areas:***

There are four discernible development/ transport corridors of which the Orange River corridor (from Springbok through Upington to Kimberley (and the Free State and Gauteng)) and the Karoo corridor (linking Namibia to Upington, passing through De Aar to the Eastern Cape) link the major economic centers in the province. These corridors are vital lifelines from a transport perspective and the proximity to established transport infrastructure to areas of relatively high economic potential is beneficial. Hence development priorities in these areas are, and of which the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Project is in support of, designating spatial development initiatives; providing direct support to catalyze flagship economic development projects along transport/ development corridors and within special resource areas; and provision of necessary infrastructure and services to support economic development.

***Stagnating Small Towns:***

A source of out-migration to other centers in the Northern Cape and other parts of South Africa as well as the basis of a significant number of people who continue to reside in these towns, will lead to reconsideration of future service provision levels. The proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility will contribute to the local economy to make the provision of services worthwhile.

Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility is aligned with the majority of the focus areas of the Northern Cape Provincial Spatial Development Strategy.

### Chapter 3: Impacts identified during the Construction Phase

The chapter first provides a description of the assessment of the impact according to sever assessment measures. The impacts occurring during the Construction Phase is then assessed.

#### 3.1 Assessment

The assessment starts with a description of the nature of the impact. This appraisal describes the type of effect the activity would have on the affected environment. This description should include what is being effected and how.

##### 3.1.1 Extent (A)

This assessment measures of the geographical scale of the impact

Extent of the Impact		
Rating	Definition of rating	Score
Local	Extending only as far as the activity, Will be limited to the site and its immediate surroundings	1
Regional	Will have an impact on the region	2
National	Will have an impact on a national scale	3
International	Will have an impact across international borders	4

The extent of some of the impact is considered mainly local whilst some impacts are regional, national or international

##### 3.1.2 Duration (B)

This assessment measure indicates the lifetime of the impact.

Duration of the Impact		
Rating	Definition of rating	Score
Short term	0-5 years	1
Medium term	e.g. 5-15 years	2
Long term	The impact will cease after the operational life of the activity, either because of natural process or by human intervention.	3
Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient	4

The duration of some of the impacts during construction is considered mainly short term, whilst the duration of the impacts during the operational phase is considered long term.

### 3.1.3 Intensity (C)

Here it should be established whether the impact is destructive or benign and should be indicated as:

Intensity of the Impact		
Rating	Definition of rating	Score
Low	The impact affects the environment in such a way that natural, cultural and social functions and processes are not affected	1 (+/-)
Medium	The affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and	2 (+/-)
High	Natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease.	3 (+/-)

The intensity of some of the impacts of the proposed project varies. In the case of the proposed project the criteria was customize and refined to their particular study (e.g. a positive impact of "high" significance is when the project could reduce local employment by 5% or more).

### 3.1.4 Probability (D)

This should describe the likelihood of the impact actually occurring indicated as:

Probability of the Impact		
Rating	Definition of rating	Score
Improbable	The possibility of the impact to materialize is very low either because of design or historic experience;	1
Probable	There is a distinct possibility that the impact will occur;	2
Highly probable	It is most likely that the impact will occur,	3
Definite	The impact will occur regardless of any prevention measures	4

### 3.1.5 Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, intensity, extent and probability and be described as:

Significance of the Impact: (F)= (A*B*D+E)*C			
Rating	Definition of rating	Score	
Low	Where it will not have an influence on the decision;	0 to - 40	0 to 40
Medium	Where it should have an influence on the decision	- 41 to - 80	41 to 80

	unless it is mitigated;		
<b>High</b>	Where it would influence the decision regardless of any possible mitigation.	- 81 to - 120	81 to 120
<b>Very High</b>	Where it would influence the decision regardless of any possible mitigation.	> - 120	> 120
<p>The above significance bands have been determined through calculating a maximum potential score of 156 (e.g. positive or negative) applying the above criteria. This was then subdivided into broad bands as indicated above to provide a comparative assessment of all impacts in relation to the maximum possible significance score.</p> <p>The overall status of the impact (after mitigation) for the preferred alternative are also assessed applying the above criteria.</p> <p>Impacts that change with a similar or nearly similar score from negative to positive or vice versa are viewed as neutralised. Impacts scoring negative and, after mitigation, become less intensity, but still negative, and more unlikely (or the negative score decreased) are also viewed as neutralised.</p>			

The above rating scales were applied to assess the impacts during the construction and operational phase.

### 3.2 Impacts identified during the Construction Phase

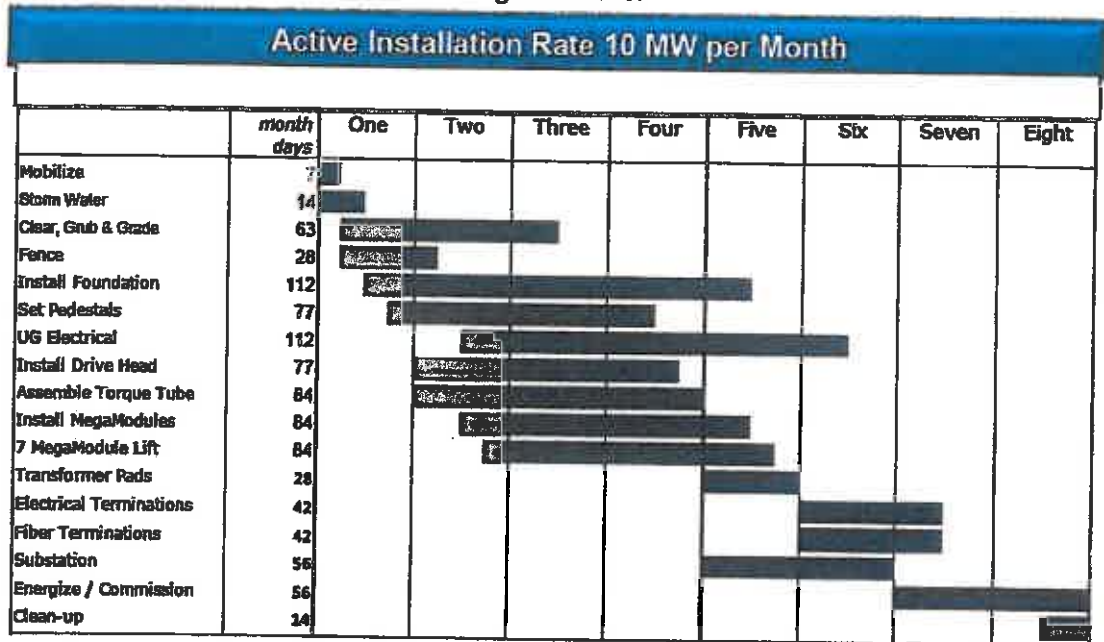
The construction phase will include the following broad activities:

<b>Activity</b>	<b>Skills required</b>
1. Prepare site	Fencing, surveying, grading and construction
2. Excavate and Install a pedestal	Excavation, trenching, cable laying, concrete work, mechanical and electrical assembly of connections with substation, steelwork assembly, casting and erection of tower.
3. Install drive head onto pedestal	Operating a crane & fixing drive head on pedestal
4. Add service cage to pedestal	Operating a crane & fixing service cage to pedestal
5. Lift Mega module into place	Operating a crane by crane & fixing mega module.
6. Complete balance of plant including actuators , invertors	Installing line hardware on towers, stringing lines and site rehabilitation

The site preparation will include surveying foundations and roads, erecting a double fence, grading roads, building a guard house. Approximately 148 support structures will be erected and excavations of 1m<sup>2</sup> by 5m deep will precede the building of the pedestals. Trenches for underground cabling will be dug. Additional temporary access roads may have to be established on site. The balance of the surface area not carrying infrastructure or equipment will remain natural.

Transmission lines are on site and the building of transmission lines will not be assessed.

The construction schedule runs over eight months.



The impacts were identified and some have been assessed and mitigation measures suggested whilst the balance of the impacts require further assessment to determine their significance.

### 3.2.1 Increased Jobs

The project will result in an increase of jobs as 30 persons will be employed over a period of 6 – 8 months. The majority of people in the Northern Cape work in agriculture, fishing and forestry, followed by Community Services. Construction, building and transport related skills are limited. Thirty eight percent (38%) of the population of Kgatelopele is unskilled, 55% semi-skilled and 7% highly skilled. Therefore others may be employed to do the work. The unemployment rate amongst the employable people in Kgatelopele is 38%.

Approximately twenty three (23) of these jobs will fall in the unskilled and semi-skilled categories. These jobs include, but are not limited to site clearing, fencing, general construction work (boxing, concrete mixing and casting), digging trenches, creation of fire breaks and operating the construction vehicles.

No of jobs: Direct : Indirect	Duration of contract	Skills levels required	Value of employment opportunities	Involvement of locals
30 : 90	8 months	16 unskilled 7 semi skilled 7 skilled	R2 million	Limited, own construction team

It is likely that some locals will be recruited to do the unskilled and semi-skilled work during the construction phase. Skilled labour (i.e. a project manager (an electrical engineer) and electricians) may be sourced provincially, nationally and internationally.

Should some or all of the unskilled and semi-skilled employment opportunities be granted to locals the competition with "outsiders" to get the work done would be eliminated. The employment of locals would have a short term positive impact on the economic and material well being of the local community as the expected value of employment opportunities over 8 months is ±R2million. Between R800 000 to R900 000 should benefit previously disadvantaged individuals.

However, should only contract workers or outside job seekers be employed, it may have an impact on the community stability and safety. Conflict between locals and outsiders may be experienced given the high unemployment rate in Kgatelopele.

The intensity of the impact on the local population will be measured according to the following scale:

	Rating	Low	Medium	High
Municipal level	Number of jobs (%)	0-147 (<1%)	148-737 (<5%)	> 738 (>5%)
Provincially		0-6195 (<1%)	6196-12394 (<2%)	>12395 (>2%)

A summary of the impact follows in Table 1 below.

Impact	Changes to the economic and material well being of the community			
Impact and Nature of Impact	Jobs will be created and locals will benefit.  Due to low skills level (skills imbalances) job seekers may stream into the local area, which in turn may impact on the safety, security and stability of the community.			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
Extent of impact (A)	Local	1	No impact	-
Duration of Impact (B)	Short term	1	No impact	-
Probability of occurrence (C)	Probable	2	No impact	-
Intensity of Impact(D)	Low	1	No impact	-
Degree of confidence (E)	High	3	No impact	-
Level of significance (AxBxD+E)xC	Low, positive	8	No impact	-
Mitigation measures:				
<ul style="list-style-type: none"> <li>Contractors, employing or seeking to employ local HDIs from the region who are suitably qualified, should get preference;</li> <li>The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the developer;</li> <li>A database of locally based firms, including SMME's owned and run by HDIs that qualify as service providers (construction companies, catering companies, waste collection companies, site cleaning</li> </ul>				

<p>companies etc) should be compiled by the developer prior to the commencement of the tender process. These firms should be invited to bid for tenders;</p> <ul style="list-style-type: none"> <li>• The developer should, where necessary, assist local HDI owned firms to complete and submit the required tender forms;</li> <li>• Establish a Monitoring Committee for the construction phase in collaboration with representatives of the local community. The Monitoring Committee has to ensure that the EMP is implemented and that any problems that arise and is associated with the construction phase, is addressed.</li> </ul>			
<b>Level of significance after mitigation</b>	Low (Highly probable:3)	12	No mitigation
<b>Related impacts</b>	<p>Influx of contract workers due to lack of skills          Influx of job seekers due to jobs created</p>		

Table 1: Impact of job creation: Construction Phase

The increase in the number of jobs is positive, but the significance of the impact is low as the number of jobs generated is of low intensity (>1% of the employable population between 16 and 65 years of age) for the local municipality and of low intensity for the Northern Cape. However, creating jobs is viewed positive given the challenge of unemployment in the municipality and in the province.

### 3.2.2 Skills development, training and capacity building

As educational levels of the Kgatelopele Municipality are low, should capacity building and skills development training programmes be implemented, it will benefit the community in the long term. Thirty eight percent (38%) of the population of Kgatelopele is unskilled, 55% semi-skilled and 7% highly skilled. Construction, building and transport related skills are limited. As people get trained their income will increase and their economic and material well-being will improve.

Obtaining skills will enable community members to find work at future construction projects in the area, municipality and the region. Future projects where employment can be obtained are the building of subsidized houses, the Upington Solar Park proposed by Eskom, and the establishment of Agri-villages, a government priority since 2011. More of these projects will be proposed and developed given the Northern Cape's Solar Irradiance and climate.

The proposed project model limits the opportunity for locals to receive on the job skill development and training. The perception that skills development opportunities exists, will cause more jobseekers to settle in the Danielskuil community and the Kgatelopele Municipal area. This may cause societal tension and instability particularly if locals do not find work.

A summary of the impact follows in Table 2 below.

Cumulative Impact	Changes in economic and material well-being			
Impact and Nature of Impact	<p>Skills levels and skills capacity will increase, but not necessarily those of the locals. The newly acquired skills may leave the area as new projects in surrounding areas come into being.</p> <p>Job seekers may join the community and impact on safety and security and the stability of the society.</p>			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
Extent of Impact (A)	Local	1	No impact	-
Duration of Impact (B)	Short term	1	No impact	-
Probability of occurrence (C)	Probable	2	No Impact	-
Intensity of Impact(D)	Low, positive	1	No Impact	-
Degree of confidence (E)	Medium	2	No Impact	-
Level of significance (AxBxD+E)xC	Low	6	No Impact	-
<p>Mitigation measures:</p> <ul style="list-style-type: none"> <li>• Reserve a number of employment opportunities for local labour.</li> <li>• Facilitate mechanisms to enable locals to access to employment.</li> <li>• The proposed development should enhance formal and informal skill transfer: <ul style="list-style-type: none"> <li>○ Should skilled persons from outside the community be employed, the developer should consider implementing a training and skills development programme to enhance the opportunities for local historically disadvantaged individuals in the construction and maintenance industry. Measures should be put in place to ensure successful training and development i.e. structured job shadowing and learnerships. Such a programme should be offered in liaison with an accredited Further Education and Training College or University;</li> <li>○ Some basic skills could be introduced at school level in a joint venture established by the developer between the primary schools in Danielskuil and the education and skills training providers. In the long term (generationally) the improved skills level will ultimately lead to improved levels of education or</li> <li>○ An "access to education support service" assisting future students should be considered</li> </ul> </li> </ul>				



attending to application fees for bursaries and financial planning and strategies for the period of studying.			
Level of significance after mitigation	Low (Highly probable (3))	9	
Related impacts	Skills drain in the Kgatelopele Municipality. Others are afforded the opportunity to develop their skills.		

Table 2: Impact of skills development, training and capacity building: Construction Phase

The skills increase is positive, but the significance of the impact is low as locals may not benefit from it. However, creating skills development opportunities for locals, irrespective of its low significance, is viewed positive given the challenge of unemployment in the municipality and in the province.

### 3.2.3 Increase in traffic

During the construction phase, construction vehicles (graders, TLB's, cement trucks and a site crane) would be used. These vehicles would stay onsite and their impact on the road to Danielskuil will be minimal. Vehicles transporting goods, materials and equipment would make use of the R31 road. Approximately 150 truckloads of materials will be delivered over the first 4-5 months resulting in 7 truckloads per week resulting in 2 trips per day. Construction workers would be accommodated in Danielskuil and will be transported in two to three vehicles per day, twice a day resulting in 6 trips per day. An increase in 8 trips per day constitutes low significance. Although the trip frequency is low, the road surface of the gravel turn off from the R31 may deteriorate and will have to be maintained.

The slow moving delivery vehicles (trucks with loads) may impact on the safety of gravel road-R31 intersection. Road signs, erected to address the additional impact of the slow moving vehicles on the intersection, will neutralize this conflict.

A summary of the impact follows in Table 3 below.

Cumulative Impact	Changes in the living environment
Impact and nature of Impact	Traffic will increase minimally (8 trips per day).  The road infrastructure is capable of accommodating the additional traffic cause by construction vehicles as most of the traffic will be take place on the construction site itself. Vehicles transporting goods will generate 14 trips per week.

	<p>The gravel turn off from R31 may deteriorate due to the load of the delivery vehicles. This may cause the road to be more unsafe.</p> <p>The intersection with the R31 will be used more frequently and the slow moving delivery vehicles may cause the intersection to be more unsafe. Road signals will have to be upgraded to neutralize the conflict at the intersection.</p> <p>Construction workers will be transported daily generating 6 trips per day.</p>		
<b>Related impacts</b>	Increased economic opportunity.		
<b>ALTERNATIVES</b>	<b>Preferred</b>	<b>No Go</b>	
<b>Extent of Impact (A)</b>	Local	1	No impact
<b>Duration of Impact (B)</b>	Short term	1	No impact
<b>Probability of occurrence (C)</b>	Probable	2	No impact
<b>Intensity of Impact(D)</b>	Low, negative	1(-)	No impact
<b>Degree of confidence (E)</b>	High	3	No impact
<b>Level of significance (AxBxD+E)xC</b>	Low, negative	8(-)	No impact
<b>Mitigation Measures</b>			
<ul style="list-style-type: none"> <li>Rehabilitate the gravel road during and particularly after construction to at least the same standard as is currently.</li> <li>Upgrade road signs to address the movement conflict at the intersection.</li> <li>Provision should be made for pedestrians to cross any access road.</li> <li>Road signs for pedestrians and protecting pedestrians should be displayed.</li> <li>Provide transport to decrease pedestrian traffic.</li> <li>Restrict heavy vehicles to specific hours.</li> <li>Road signs signal times when heavy vehicles will make use of the road.</li> </ul>			
<b>Level of significance after mitigation</b>	Low, positive	8	
<b>Related impacts</b>	Minimal increase in pedestrian traffic.		

Table 3: Impact of Traffic: Construction Phase

The intensity of the impact caused by the increase of traffic is low but negative. Mitigation measures will reverse the impact to be of equal positive low significance. Hence the impact has been neutralised. The No Go alternative will have no impact.

### 3.2.4 Increased use of Municipal and Authority Services

Health amenities will be utilized should a construction related accident happens. It is anticipated that there is sufficient capacity in Danielskuil to handle emergencies until routed to Kimberley or Upington. Construction related accidents may in the short-term,

place additional pressure on the existing emergency facilities. However the likelihood of emergencies occurring, is unlikely as national safety standard will have to be adhere to.

The temporary stay of the construction team may cause future pressure on the clinic due to undesirable sexual behaviour. There will also be a temporary increased in the demand for accommodation i.e. rental housing in Danielskuil. The temporary stay of the construction team will not increase the demand for services but will utilise existing services.

A summary of the impact follows in Table 4 below.

Cumulative Impact	Changes in the living environment			
Impact and Nature of Impact	Demand for services may increase sporadically:  Health and emergency facility capacity may be required to cope with any construction accidents.  Additional pressure may also be placed on community health services to deal with the consequences of undesirable sexual behaviour.  Temporary accommodation will be required using existing services.			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
Extent of impact (A)	Local	1	No impact	-
Duration of impact (B)	Short term	1	No impact	-
Probability of occurrence (C)	Highly Probable	3	No impact	-
Intensity of impact(D)	Low, negative	1(-)	No impact	-
Degree of confidence (E)	High	2	No impact	-
Level of significance (AxBxD+E)xC	Low, negative	3(-)	No impact	-
Mitigation Measures	<ul style="list-style-type: none"> <li>To adhere to international construction health and safety standards and precaution measures.</li> <li>To provide health and social training amongst the project team and in the community.</li> <li>To make effort to ensure that the project team and their families meet at least monthly.</li> </ul>			
Level of significance after mitigation	Low (Probability:2, Intensity: 0)	4	No mitigation	
Related impacts	Long term consequences of undesirable sexual behaviour.			

Table 4: Impact of services demand: Construction Phase

The impact of the temporary construction team on amenities and municipal serves is low, yet the intensity is negative. After mitigation the probability of the impact happening become less and the intensity decrease. These positive changes slightly outweighed the negative intensity and the impact is being assessed as neutralised. The No Go alternative will have no impact.

### 3.2.5 Decreased Health

Dust and noise will be generated during the establishment of the construction site, but only for a limited time. Excavation activities such as for building and infrastructure foundations, trenches for cabling and piping may affect the noise and dust levels for a limited time. After preparation and during the building period noise will be generated by activities such as concrete mixing, building, concrete vibration and steel work, and the installation of services. On-site vehicle movement, delivery of materials and equipment and additional traffic will also create noise. These impacts will be of a local nature, opposite the existing mine and for a limited period of time.

Irrespective of local or "others" be employed, increased movement may lead to crime and trespassing.

A summary of the impact follows in Table 5 below.

Cumulative impact	Changes In the health and social well-being			
<b>Impact and Nature of Impact</b>	<p>Dust and noise may impact on the health of employees, locals and the neighbours but for a short term during the construction period. Dust and noise cause respiratory or psychological illnesses. In the long term it may lead to the depopulation of the area.</p> <p>Dust and noise will occur during the construction period of 8 months, which is short term. The location of the proposed facility is removed from the town environment and there are only heavy industrial facilities (mining) right next to site. Given the short term nature and location of the site it is unlikely that dust and noise will have a significant impact.</p> <p>Dust and noise suppression can be applied as mitigation measure to maintain the standard of health as from the start of the project.</p>			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
<b>Extent of impact (A)</b>	Local	1	No impact	-
<b>Duration of Impact (B)</b>	Short term	1	No impact	-
<b>Probability of occurrence (C )</b>	Probable	2	No impact	-
<b>Intensity of Impact(D)</b>	Medium, negative	2(-)	No impact	-
<b>Degree of confidence (E)</b>	High	3	No impact	-
<b>Level of significance (AxBxD+E)xC</b>	Low, negative	10(-)	No impact	-
<b>Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>• Dust creation must be controlled as per construction management and control code.</li> <li>• Noise creation should be controlled as per construction management and control code.</li> <li>• Appoint an Environmental Control Officer to supervise construction and building.</li> <li>• Adhere to the Environmental Management Plan (EMP) for the Construction Phase.</li> </ul>				

<ul style="list-style-type: none"> <li>• All workers and management must undergo an induction course.</li> <li>• All road construction must be limited to the road reserve.</li> <li>• Any natural habitat destroyed by constructing infrastructure should be rehabilitated.</li> <li>• Enforce strict operating hours for heavy vehicles and construction activities on site to reduce noise and dust impacts on adjacent landowners.</li> <li>• Implementation dust suppression measures;</li> <li>• Access must be on recognised routes.</li> <li>• Litter and littering must be strictly controlled.</li> <li>• All construction waste and building rubble must be removed off site.</li> <li>• Cut and fill should be kept to a minimum and should be rehabilitated immediately.</li> </ul>			
<b>Level of significance after mitigation</b>	Low , negative (Unlikely:1; Intensity: 1(-))	4(-)	
<b>Related impacts</b>			

*Table 5: Impact of dust and noise: Construction Phase*

The intensity of the impact of dust and noise is medium negative and the significance low as the impact occurs over a short period of time. Mitigation will neutralize the impact as the intensity decreases, but are still negative and likelihood of the impact to occur becomes less.

The occurrence of increase crime, trespassing and stock theft is unlikely given the location of the proposed project and the mitigation measures should be adhered to.

The No Go alternative has no impact.

### **3.2.6 Increased Sales**

During the construction phase, the general building materials, such as stone, cement, bricks and fuel will be purchased locally. Domestic purchases, such as groceries, liquor and restaurant services will also bought in Danielskuil and the provincial surroundings. This will cause the sales volumes (direct and indirect) to increase. The panels and related equipment will be purchased internationally. The impact there of is not assessed. The assessment focused on the regional GDP.

The capital expenditure on completion is R308.8 million. The capital expenditure locally (in Northern Cape and South Africa) is estimated as R161million.

The increase in sales volume is as follows:

Sales Volume	Preferred Option	No Go
Direct Sales ('000 000)	212	0
Indirect Sales ('000 000)	392	0
Total Sales ('000 000)	604	0
% increase in Sales Volume	<1	0

Sales will benefit the province but to a lesser extend the municipality or Danielskuil. As Danielskuil is a small village, people may tend to go shopping or purchase services and stock in bigger centres such as Uptington. This would lead to the dilution of sales in Danielskuil lost to the region. Sales will contribute to the GGP of the region. Effort should be made to keep the sales in the Northern Cape and not to lose these sales to the country. Appropriate mitigations measure should be explored.

Intensity will be measured according to the following scale:

Rating	Low	Medium	High
% change to Sales output	<10%	10% - 50%	>50%

A summary of the impact follows in Table 6 below.

Cumulative Impact	Changes in the economic and material well-being			
Nature of Impact	Sales volume will increase. Direct and indirect sales volume will increase and it is highly likely that sales will be diluted to the benefit of the province.			
Extent	Local – Regional			
Duration	Short term			
Related Impacts	None.			
<b>ALTERNATIVES</b>	<b>Preferred</b>	<b>No Go</b>		
Extent of Impact (A)	Local-Regional	2	No impact	-
Duration of Impact (B)	Short term	1	No impact	-
Probability of occurrence (C)	Probable	2	No impact	-
Intensity of Impact(D)	Low	1	No Impact	-
Degree of confidence (E)	Medium	2	No impact	-
Level of significance (AxBxD+E)xC	Low	8	No impact	-
Mitigation Measures	<ul style="list-style-type: none"> <li>Contractors should be directed by tender criteria to purchase locally and to make use of local service providers.</li> <li>Spending money locally should benefit employees. The proposed development should leverage</li> </ul>			

discount in the local economy of the municipal area.			
<ul style="list-style-type: none"> <li>• Small business should be supported (i.e. skills training, assistance and guidance to set up small businesses) and joint ventures with previous disadvantaged persons should be promoted.</li> <li>• The promotion of joint ventures between small business (owned by previous disadvantaged persons) and more established business should be encouraged.</li> </ul>			
<b>Level of significance after mitigation</b>	Low (Highly probable (3))	12	No mitigation
<b>Related impacts</b>	None.		

Table 6: Impact of Sales: Construction Phase

The impact of sales is low, as the increase in sales is less than 1% of the national sales but positive. Mitigation measures will prohibit sales to be diluted to the benefit of the country. Mitigation measures will be directed towards the provincial economy, yet the impact will stay low. The No Go alternative has no impact.

### 3.2.7 Increased GGP

The increase in sales volume will contribute to the GGP of the province. The impact during the construction phase will not be significant enough to change the leading economic contributor to the Northern Cape GGP. The contribution to the GGP is as follows

GGP	Preferred Option	No Go
Direct GGP ('000 000)	32	0
Indirect GGP ('000 000)	182.5	0
Total GGP Contribution ('000 000)	214.5	0
% change in GGP	<1%	0

Table 24: GGP contribution: Construction Phase

Intensity will be measured according to the following scale:

Rating	Low	Medium	High
% change to GGP output	<10%	10% - 50%	>50%

A summary of the impact follows in Table 7 below.

<b>Cumulative Impact</b>	<b>Changes in the economic and material well-being</b>
<b>Nature of Impact</b>	GGP will increase. Direct and indirect sales volume will increase which will lead to an increase of the GGP of the province.

ALTERNATIVES	Preferred		No Go	
Extent of impact (A)	Local & Provincial	2	Local	1
Duration of Impact (B)	Short Term	1	Short term	1
Probability of occurrence (C)	High	3	High	3
Intensity of Impact(D)	Low	1	Low	1
Degree of confidence (E)	High	3	High	3
Level of significance (AxBxD+E)xC	Low	15	Low	12
Mitigation Measures None				
Level of significance after mitigation	No mitigation		No mitigation	
Related impacts	None			

Table 7: Impact of GGP: Construction Phase

The significance of the impact on the GGP is low but positive for the province and the municipal area. The No Go alternative has a low impact.

### 3.3.3 Summary of impacts during Operational Phase

The impacts identified, based on a basic model which could be changed to have overall better outcomes, all have a low level of significance and significance stays low after mitigation. Impacts that are negative can all be reversed through mitigation to become positive although their significance stays low. The mitigation measures thus neutralise the impact. The table below lists all the impacts identified during the construction phase and their significance (low or high) and intensity (positive or negative) before and after mitigation.

Impacts during Construction	Alternative: Preferred Sig/ intensity		Alternative: Preferred Mitigated		Alternative: No Go
Job creation	Low, positive	8	Low, positive	12	No impact
Skills development	Low, positive	6	Low, positive	9	No impact
Traffic	Low, negative	8(-)	Low, positive - neutral	8	No impact
Municipal services	Low, negative	3(-)	Low, positive - neutral	4	No impact
Health	Low, negative	10(-)	Low, negative – neutral	4(-)	No impact
Safety	Low, negative	10(-)	Low, negative – neutral	4(-)	No impact
Sales volume	Low, positive	8	Low, positive	12	No impact
GGP contribution	Low, positive	15	No mitigation measures	-	No impact



## Chapter 4:

### Impacts identified during Operations and Decommissioning Phase

The impact occurring during the Operational and Decommissioning Phase is assessed in this chapter.

#### 4.1 Increased Jobs

The proposed facility should result in an increase of jobs during the operation of the project. The generation of energy is not labour intensive and a total of seven (7) to ten (10) permanent jobs will be created. The facility will contract a service provider to do the site maintenance and cleaning. This service provider will not be locally based, but will be a roaming team that will also maintain and clean other Roma Photovoltaic Energy Generation Facilities. The roaming team will visit the site on average four times a year. The roaming team will include general workers (cleaners) and a project manager (electrician). Security service will be contracted locally.

The expected current value of the employment for the first ten (10) years is R8.7million of which approximately 56% or R4.9 million rand will benefit previously disadvantaged individuals.

The local and district community's opportunity to benefit from the increased jobs are restricted given the model employed (making use of service providers based in the province), but the Northern Cape Province will benefit as such.

Conflict between locals and outsiders will also be restricted as the roaming team will not have a permanent presence in the village.

A summary of the impact follows in Table 8 below.

Impact	Changes to the economic and material well being of the community			
Impact and Nature of Impact	Jobs will be created but will mainly benefit the province given the model employed to source services.  The services provided locally, and in particular security services, will benefit for locals.			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
Extent of impact (A)	Provincial	4	No Impact	-

Duration of Impact (B)	Long term	3	No impact	-
Probability of occurrence (C)	Probable	2	No impact	-
Intensity of Impact(D)	Low	1	No impact	-
Degree of confidence (E)	High	3	No impact	-
Level of significance (AxBxD+E)xC	Low	30	No impact	-
Mitigation measures:				
<ul style="list-style-type: none"> <li>Local contractors, employing or seeking to employ local HDIs from the region who are suitably qualified, should get preference;</li> <li>The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the project administrator;</li> <li>The developer should, where necessary, assist local HDI owned firms to complete and submit the required tender forms;</li> <li>Skills transfer and development, formally and informally, should be implemented together with local education and skills training providers (e.g. job shadowing).</li> </ul>				
Level of significance after mitigation	Medium (Highly probable: 3)	45		
Related impacts	Unemployment levels stay high at local municipal level.			

Table 8: Impact of job creation: Operational Phase

As job creation will affect less than <1% of the employable population, its significance is low but with mitigation it changes to medium. However as skills levels are very low (57% of the population is unskilled), affording 7-10 people the opportunity to get employed is significant in comparison with the No Go alternative generating no opportunities.

#### 4.2 Skills development, training and capacity building

As educational levels of the Kgatelopele Municipality are low, should capacity building and skills development training programmes be implemented, it will benefit the community in the long term. Thirty eight percent (38%) of the population of Kgatelopele is unskilled, 55% semi-skilled and 7% highly skilled. As people get trained their income will increase and their economic and material well-being will improve. The majority of people work in agriculture, fishing and forestry, followed by community services. The energy sector is new to the region and related skills are limited.

Obtaining skills will enable community members to find work at other alternative energy facilities in the area, municipality and the region. Several of these projects will be proposed and developed given the Northern Cape's Solar Irradiance and climate.

The creation of the opportunity to work and to receive training and skills development will cause more jobseekers to settle at the base town of the roaming cleaning and maintenance team. The base town of the roaming team is not as yet finalized but will be within the Northern Cape Province. This may cause societal tension and instability particularly if locals do not find work.

A summary of the impact follows in Table 9 below.

Cumulative Impact	Changes in economic and material well-being			
Impact and Nature of Impact	Skills levels and skills capacity will increase provincially, but not necessarily those of the locals. The newly acquired skills may leave the province as new projects in neighbouring provinces come into being.  Job seekers may join the community and impact on safety and security and the stability of the society.			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
Extent of impact (A)	Local	1	No impact	-
Duration of impact (B)	Short term	1	No Impact	-
Probability of occurrence (C)	Probable	2	No Impact	-
Intensity of impact(D)	Low, positive	1	No Impact	-
Degree of confidence (E)	Medium	2	No Impact	-
Level of significance (AxBxD+E)xC	Low	6	No Impact	-
Mitigation measures:				
<ul style="list-style-type: none"> <li>• Reserve a number of employment opportunities for local labour.</li> <li>• Facilitate mechanisms to enable locals to access to employment.</li> <li>• The proposed development should enhance formal and informal skill transfer: <ul style="list-style-type: none"> <li>○ Should skilled persons from outside the community be employed, the developer should consider implementing a training and skills development programme to enhance the opportunities for local historically disadvantaged individuals in the construction and maintenance industry. Measures should be put in place to ensure successful training and development i.e. structured job shadowing and learnerships. Such a programme should be offered in liaison with an accredited Further Education and Training College or University;</li> </ul> </li> </ul>				

<ul style="list-style-type: none"> <li>o An "access to education support service" assisting future students should be considered attending to application fees for bursaries and financial planning and strategies for the period of studying.</li> </ul>			
<b>Level of significance after mitigation</b>	Low (Highly probable (3))	9	
<b>Related impacts</b>	Others in the Northern Cape Province are afforded the opportunity to develop their skills and not the locals of the Kgatelopele municipality.		

*Table 9: Impact of skills development, training and capacity building: Operational Phase*

As skills development will affect less than <1% of the employable unskilled population before and after mitigation the significance thereof is low. However as skills levels are very low (55% semi-skilled and 38% of the population is unskilled), affording approximately 7 people the opportunity to gain skills, is viewed as significant in comparison with the No Go alternative. The significance of gaining skills has been reiterated during interviews with community workers in Kgatelopele. The skills gained will not only benefit the persons obtaining them, but will benefit their families. It will give people confidence and help to obtain employment or to be self-employed. In the long term it will reduce drug and alcohol abuse.

#### **4.3 Increase in traffic**

During the operational phase security staff will commute to the site twice a day resulting in four trips per day. Trips generated by the roaming cleaning and maintenance team are infrequent and may average approximately 24 trips per annum. The increase in the number of trips has a very low intensity and is not significant (it is equal to the number of trips a residential dwelling will generate). Therefore the impact will not be further assessed.

#### **4.4 Increased use of Municipal and Authority Services including housing**

Health amenities may be utilized by the maintenance and cleaning team when they are visiting the area on average four times a year. It is anticipated that there is capacity in Danielskuil to handle routine visits and that emergencies will be routed to Upington. The intensity of the impact is low, it is infrequent and the significance low. Therefore the impact will not be further assessed.

#### 4.5 Decreased Health and Safety

The facility as such, will have no impact on health.

Operational phase:

- No noise impact is anticipated.
- Fire may be a hazard and put pressure on the Municipal Fire Fighting Service should a fire occur. However during the preparation of the site, fire breaks would be prepared along the fence to reduce the possibility of runaway fires. The site will be equipped with fire fighting equipment and gear as per international standard. The local mine has excellent fire fighting equipment and has helped to extinguish fires in the past. An agreement should be reached with the mine to use their fire fighting equipment and staff in case of a fire. The fire fighting readiness of the neighbouring mine may ease off the pressure of the District Fire Fighting team. These measures should neutralize the pressure that the facility may cause on the Municipal Fire Fighting Service.
- Irrespective of locals or "others" be employed, there may be the fear that trespassing on the neighbouring industrial properties may occur. However the plant and related infrastructure will be safe guarded 24 hours. Liaison with the local South African Police will also decrease the possibility of the impact happening. Given the proximity of Erf 753, it is unlikely that live stock theft will be associated with the facility.

Decommissioning phase:

- Special safety procedures according to international standards are required and any safety impacts should be prohibited and their probability to occur will be very low.
- The noise impact will be short term and only the neighbouring mine might be affected.

A summary of the impact follows in Table 10 below.

Cumulative Impact	Changes in the health and social well-being
Impact and Nature of Impact	<p>The anticipated impacts on health and safety is limited:</p> <p>Operational: The likelihood of health impacts occurring, is low as maintenance of the site according to international standards will have to be adhered to.</p> <p>No noise impact will occur.</p> <p>Fire will be a severe hazard, but with the required standards and</p>

	equipment in place it can be managed.			
	<b>Decommissioning</b> Health and safety risks will increase during the decommissioning of the plant. However, the risks appear to be minimal as international standards will have to be adhered to.			
	Noise will be generated during the decommissioning phase.			
<b>ALTERNATIVES</b>	<b>Operational</b>		<b>Decommissioning</b>	
<b>Extent of impact (A)</b>	Local	1	Local	1
<b>Duration of Impact (B)</b>	Long term	3	Short term	3
<b>Probability of occurrence (C)</b>	Unlikely	1	Probable	2
<b>Intensity of Impact(D)</b>	Medium, negative	2(-)	Medium, negative	2(-)
<b>Degree of confidence (E)</b>	Low	1	Moderate	2
<b>Level of significance (AxBxD+E)xC</b>	Low, negative	7(-)	Low, negative	16(-)
<b>Mitigation Measures</b> <ul style="list-style-type: none"> <li>• Keep fire breaks intact.</li> <li>• Adhere to fire fighting equipment and gear as per international standard.</li> <li>• An agreement should be reached with the mine to use their fire fighting equipment and staff in case of a fire.</li> <li>• Liaison with the local South African Police from the operational phase to prohibit stock theft.</li> <li>• <i>Enforce strict operating hours to reduce movement and noise impacts on adjacent landowners during decommissioning.</i></li> <li>• <i>Access must be on recognised routes.</i></li> <li>• <i>Adhere to the Environmental Management Plan (EMP) for the Operational Phase and decommissioning phase.</i></li> </ul>				
<b>Level of significance after mitigation</b>	Low, negative (Intensity: 1)	4(-)	Low (Intensity: 1(-))	10(-)
<b>Related impacts</b>				

Table 10: Impact of health and safety hazards: Operational Phase

The probability of dust and noise occurring is unlikely during operations. Should fires occur during operations, the precaution measures cause the impact to be of medium intensity and low significance. The probability of crime and trespassing is negligible during operations.

The probability of dust and noise occurring is like during decommissioning and mitigation measure will lessen the intensity and significance. Should fires occur during decommissioning, the precaution measures cause the impact to be of medium intensity

and low significance. The probability of crime and trespassing is negligible during decommissioning.

The No Go alternative has no impact.

#### 4.6 Increased Sales

During the operational phase, specialized materials and equipment will be required for maintenance that will be purchased in the province. Domestic purchases will be bought in Danielskuil and the provincial surroundings. This will cause the sales volumes (direct and indirect) to increase slightly. Sales of the proposed project will contribute to the economy locally at municipal level and provincially. Effort should be made to keep the sales in the Northern Cape and appropriate mitigations measure should be explored.

The sale of electricity will increase and will benefit the province and country. It is estimated that electricity to the value of R65 Million will be sold annually.

Sales	Preferred Option	No Go
Direct Sales('000 000)	70	0
Indirect Sales ('000 000)	130	0
Total Sales ('000 000)	200	0
% change in Sales	<1%	0

Table 32: Impact of Sales: Operational Phase

Intensity will be measured according to the following scale:

Rating	Low	Medium	High
% change to Sales output	<10%	10% - 50%	>50%

All sales resulting from selling electricity and spending R3.5 million to operate the plant, will cause in a change of less than 1%. A summary of the impact follows in Table 11 below.

Cumulative Impact	Changes in the economic and material well-being			
Nature of Impact	Sales volume will increase.			
<b>ALTERNATIVES</b>	Preferred		No Go	
Extent of Impact (A)	Local & Provincial	4	No impact	-
Duration of Impact (B)	Long term	3	No impact	-
Probability of occurrence (C )	Probable	2	No impact	-
Intensity of Impact(D)	Low	1	No impact	-

Degree of confidence (E)	High	3	No impact	-
Level of significance (AxBxD+E)xC	Low	30	No impact	-
Mitigation Measures				
<ul style="list-style-type: none"> <li>Contractors should be directed by tender criteria to purchase locally and to make use of local service providers.</li> <li>Spending money locally should benefit employees. The proposed development should leverage discount in the local economy of the municipal area.</li> <li>Small business should be supported (i.e. skills training, assistance and guidance to set up small businesses) and joint ventures with previous disadvantaged persons should be promoted.</li> <li>The promotion of joint ventures between small business (owned by previous disadvantaged persons) and more established business.</li> </ul>				
Level of significance after mitigation	Medium; (Highly probable (3))	45	No mitigation	
Related impacts	None.			

Table 11: Impact of Sales: Operational Phase

The impact on sales is less than <1% of the regional sales and hence low. With mitigation the significance of the impact can be enhanced and change to be of medium significance. The No Go alternative has no impact on Sales.

#### 4.7 Increased GGP

The increase in sales volume related to the selling of electricity will contribute to the GGP of the province. Although of low or medium significance, the overall impact of alternative energy in the Northern Cape will increase the GGP and may cause Mining or Financial services as the leading or second leading economic sector in the province to change to Electricity. The contribution of the facility to the provincial GGP is as follows:

GGP	Preferred Option	No Go
Direct GGP ('000 000)	12	0
Indirect GGP ('000 000) <sup>1</sup>	68	0
Total GGP ('000 000)	80	0
% change in GGP	<1%	0

Table 34: GGP contribution: Operational Phase

<sup>1</sup> R3 mil road, R37mil building, R0.8mil, concrete foundation



Intensity will be measured according to the following scale:

<b>Rating</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>% change to GGP output</b>	<b>&lt;10%</b>	<b>10% - 50%</b>	<b>&gt;50%</b>

A summary of the impact follows in Table 12 below.

<b>Cumulative Impact</b>	<b>Changes in the economic and material well-being</b>			
<b>Nature of Impact</b>	GGP will increase. Direct and indirect sales volume in electricity increase which will lead to an increase of the GGP of the province.			
<b>ALTERNATIVES</b>	<b>Preferred</b>		<b>No Go</b>	
<b>Extent of Impact (A)</b>	Regional	2	No impact	-
<b>Duration of Impact (B)</b>	Long Term	3	No impact	-
<b>Probability of occurrence (C )</b>	Highly probable	3	No impact	-
<b>Intensity of Impact(D)</b>	Low	2	No impact	-
<b>Degree of confidence (E)</b>	High	3	No impact	-
<b>Level of significance (AxBxD+E)xC</b>	Medium	45	No impact	-
<b>Mitigation Measures</b>	None			
<b>Level of significance after mitigation</b>	Medium	45	No mitigation	
<b>Related Impacts</b>	The leading economic may sector change.			

Table 12: Impact of GGP: Operational Phase

The intensity of the impact on the GGP is low and yet the impact is of medium significance before and after mitigation. The No Go alternative has no impact.

#### 4.8 Sense of place

The view catchment landscape is a fairly flat plain with occasional low hills. The plain area however display a level of gradient that present a fairly high level of absorption and views are restricted to the immediate environment and seldom more than 5km. Erf 753, Danielskuil is located in a heavy industrial area which absorbs the visual change the proposed facility brings about. The Lime mine is a prominent feature approaching the town from the south. ESKOM substation and High Voltage power lines is a prominent feature approaching town from the south R31 connecting Danielskuil with Kuruman and runs north-south through the town. Other activities in the proximity of the site are the sewerage works and lime mine and dump.

Due to the medium absorption capacity of the landscape, the development will easily be absorbed into the existing structures. Due to solar units being on the same site as the substation, the transmission lines will have very little additional impact on the current land use and thus visual appearance.

The level of visual impact is of such level that no mitigation to the proposed on-site development elements necessary, but in order to avoid any potential glare impacts of the R31 southbound, it can be considered to provide a soft screen along the road of height between 1,2 -1,8m.

The proposed facility does not present an unacceptable level of change to the visual environment and therefore the impact of the development can be rated as low.

A summary of the impact follows in Table 13 below.

Cumulative Impact	Changes in the quality of the living environment			
Impact and Nature of Impact	The visual environment of the area will change, but the change will be absorbed.  The visual impact will be limited as the area which is already populated with infrastructure.			
<b>ALTERNATIVES</b>	<b>Preferred</b>	<b>No Go</b>		
Extent of impact (A)	Local	1	No impact	-
Duration of Impact (B)	Long term	3	No impact	-
Probability of occurrence (C )	Highly probable	3	No impact	-
Intensity of Impact(D)	Low, negative	1(-)	No impact	-
Degree of confidence (E)	High	3	No impact	-
Level of significance (AxBxD+E)xC	Low, negative	9(-)	No impact	-
<b>Mitigation Measures</b>				
<b>Design phase</b>				
<ul style="list-style-type: none"> <li>A photographic record of the site and its immediate surrounding area must be kept as part of the EMP to serve as a baseline for measurement of all future visual impacts and as an aid to the full rehabilitation of the site should the facility be decommissioned in future.</li> <li>Excavation on the site is to be kept to the absolute minimum required for the successful implementation of the project.</li> <li>The fencing design is to imitate rural fencing in the area while at the same time providing the security that is necessary. It is to be visually permeable. No barbed wire is to be used.</li> <li>Any necessary lighting must be shielded in such a way that no direct light is allowed to escape into the surrounding terrain or up into the sky. Only the areas that are necessary to be lit must be lit with the surrounding terrain being protected from any light pollution.</li> </ul>				

Operational			
<ul style="list-style-type: none"> <li>• Provide a soft screen along the road of between 1.2- 1.8m</li> <li>• Littering is to be strictly controlled over the entire life of the project.</li> <li>• All waste is to be regularly removed from facility to a recognized dumping site. Waste, in any form, should not be allowed to collect on the site.</li> <li>• The use of any cleaning materials or defoliants to aid in the control of vegetation is to be strictly monitored so that their long-term use does no cause future problems should the site be decommissioned.</li> <li>• The use of lighting is to be monitored over the entire life of the project so as to minimize light pollution.</li> <li>• A strict fire prevention policy must be implemented and monitored.</li> </ul>			
Decommissioning			
<ul style="list-style-type: none"> <li>• The site is to be returned to as near as its existing visual state as is possible.</li> <li>• All waste material is to be removed from site.</li> </ul>			
Level of significance after mitigation	Low	9(-)	No mitigation
Related impacts	Light pollution at night. Lack of awareness amongst locals and tourists about sustainable energy.		

Table 13: Visual Impact: Operational Phase

The significance of the visual impact of the proposed photovoltaic electricity generation facility on the environment during the operations phase is rated low negative before and after mitigation. The recommendations of the visual impact assessment should be implemented per Environmental Management Plan as these recommendations will ensure that the impact is neutralized after decommissioning. The No Go alternative has no impact.

#### 4.9 Tourism

The proposed facility can serve as a tourism attraction. The extent of its tourism potential including the kind of tourism has to be established. Should tourists visit the facility, other tourism activities in the region such as site seeing, game driving and agri-tourism may benefit.

A summary of the impact follows in Table 14 below.

Cumulative Impact	Changes in economic and material well-being
Impact and Nature of Impact	Tourism can be enhanced.  Visitors may visit other tourist activities close by which will benefit such activities and enhance the local economy.

ALTERNATIVES	Preferred		No Go	
Extent of Impact (A)	Local	1	No impact	-
Duration of Impact (B)	Long term	3	No impact	-
Probability of occurrence (C)	Medium	2	No impact	-
Intensity of impact(D)	Low, positive	2	No impact	-
Degree of confidence (E)	Medium	2	No impact	-
Level of significance (AxBxD+E)xC	Low, positive	16	No impact	-
Mitigation Measures				
<ul style="list-style-type: none"> <li>Market the photovoltaic electricity generation facility as a tourist destination.</li> <li>Create links with other tourism activities in Danielskuil through a website and the local tourism office.</li> </ul>				
Level of significance after mitigation	Low, positive	16		
Related impacts	Expansion of tourism properties of the facility.			

Table 14: Impact of and on tourism: Operational Phase

The significance of the impact caused by the proposed photovoltaic electricity generation facility on tourism is of medium significance before and after mitigation. The No Go alternative has no impact on tourism.

#### 4.10 Summary of impacts during Construction and Decommissioning Phase

Most of the impacts identified have a low level of significance and significance stays low after mitigation as listed in the table below. However the impact of the proposed photovoltaic electricity generation facility on the GGP sales will change to medium significance after mitigation. The impact of the proposed facility on both Health and Safety and Sense of Place will be low negative and stay low negative during the Operational Phase. The impact of Health and Safety during decommissioning is low and negative but mitigation decreases its negative impact to become neutral.

Impacts: Operations & Decommissioning	Alternative: Preferred		Alternative: Preferred Mitigated		Alternative: No Go
Job creation	Low, positive	30	Medium, positive	45	No impact
Skills development	Low, positive	6	Low, positive	9	No impact
Traffic	Unlikely		-		No impact
Municipal services	Unlikely		-		No impact

<b>Health &amp; Safety (operations)</b>	Low, negative	7(-)	Low, negative	4(-)	No impact
<b>Health &amp; Safety (decommissioning)</b>	Low, negative	16(-)	Low, negative - neutral	10(-)	No impact
<b>Sales volume</b>	Low, positive	30	Medium-high, positive	45	No impact
<b>GGP contribution</b>	Low, positive	45	No mitigation	45	No impact
<b>Sense of place</b>	Low, negative	9(-)	Low, negative	9(-)	No impact
<b>Tourism</b>	Low, positive	16	Low, positive	16	No impact

This report identified the social variables and impacts and assessed these impacts based on a basic model which could be changed to have overall better outcomes. Management guidelines to be incorporated in the Environmental Management Plan are proposed in the chapter to follow.

## **Chapter 5:**

### **Management guidelines to address socio-economic impacts**

In order to ensure that the disadvantages are managed to maximize positive impacts, specific management strategies and mechanisms need to become part of the proposed development. These strategies and mechanisms need to be implemented through development conditions and are as follows:

- a) Skills development despite,
- b) Preferential procurement policies,
- c) Enhancing the sense of place.

To implement the strategies and mechanisms, the development should enable the administration and liaison of the various strategies and mechanisms. The administration and liaison of the strategies and mechanisms should be in partnership with the local authority.

The recommendations follow below.

#### **5.1 Skills development**

Skills development should be done according to national norms and standards, enabling people to not only access the job market but to stay in the job market. The following is proposed:

- Training and skills development programmes to enhance the opportunities for local historically disadvantaged individuals in the construction, minerals and energy, maintenance, light industrial and wholesale and retail sectors should be the focus.
- Skills transfer and development, formally and informally, should be co-ordinated together with local education and skills training providers (e.g. job shadowing) that are accredited and acknowledged by the Department of Education and the Committee for Higher Education and Training;

- Some basic skills can be introduced at school level in a joint venture between the primary schools and the developer. In the long term (generationally) the improved skills level will ultimately lead to improved levels of education.
- Communication and information facilities should be established or improved to enhance access to information and educational opportunities.
- There are several educational institutions that can support the development of skills and qualifications. The following institutions can be approached, although the list is not limited to these institutions:
  - Higher and Further Education Institutions
  - Sector Education and Training Authority (SETA) (established in accordance with the Skills Development Act of 1998) i.e. the Construction Education and Training Authority (CETA) and Energy Sector Education and Training Authority (ESETA) that monitor and facilitate training in the construction sector and in particular in civil construction and building construction and in the energy sector respectively.
- Other key measures introduced by government to combat skills shortages that should become part of the development proposal, either as the responsibility of the contractors or as part of the grant contributed to the community by the developer are:
  - The Kha Ri Gude programme aimed at acquiring basic literacy and numeracy skills (ABET 1 – 4) for adults.
  - The aftercare programme for school children offered by the Department of Social Development.
  - SMME support programmes offered by the Department of Trade and Industry.
- Skills training will assist the Danielskuil community to be better prepared to compete for the opportunities created by the proposed photovoltaic electricity generation facility development. There are a number of options that can be considered in this regard, namely:
  - a) Enter into a Partnership with a local College and ensure alignment of courses offered with skills required by the proposed development or support the college to

offer the relevant courses should they not do so. The training should be a combination of theory and "on the job" training.

b) Facilitate the attendance of training courses offered by the various institutions for those employed in Danielskuil and the surrounding communities.

c) Access the levy refunds through the SETAs in the required sectors (e.g. CETA & ESETA).

d) Apply the procurement policy proposed (discussed in the following subsection).

- The skills drive should, from the start, engage with the community to obtain their contributions to what is required, how it should be offered and how to access information and communication regarding training and skills development.

## **5.2 Preferential procurement policies**

Preferential procurement policies could include the following:

- Local contractors, employing or seeking to employ local historically disadvantaged South Africans from Danielskuil and the region who are suitably qualified, should get preference;
- The municipality, local community and local community organizations should be informed of the project, and the potential job opportunities, by the developer;
- A database of locally based firms, including SMME's owned and run by historically disadvantaged individuals that qualify as service providers (construction companies, catering companies, waste collection companies etc), should be compiled by the administrator prior to the commencement of the tender process. These firms should be invited to bid for tenders;
- The developer should, where necessary, assist local HDI owned firms to complete and submit the required tender forms.
- Establish and maintain communication and information facilities to enhance SMME's access to information and trading opportunities.
- Procurement procedures and contracts with builders should ensure that previously disadvantaged persons benefit as per Black Economic Empowerment guidelines.



- Labour instead of technology should be preferred without compromising timelines, cost and quality during the Construction and Building Phase according to the Expanded Public Works Programmes Principals.
- Procurement policies should support purchases from local suppliers of materials, goods and services and local SMME should get preference.
- Historically disadvantaged persons, who are suitably qualified, should get preference and should benefit during the Operational Phase of the proposed photovoltaic electricity generation facility.
- Spending money locally should benefit employees. The proposed development should leverage discount in the local economy of the municipal area.
- The municipality, local community and local community organizations should be informed of the project and the potential job opportunities by the developer;

### **5.3 Enhancing the sense of place**

Enhance sense of place, whilst supporting the growing construction sector in Danielskuil, should include the following:

- Appoint an Environmental Control Officer to supervise construction and building.
- All construction and building work fall under a comprehensive set of guidelines that determine acceptable standards for visual issues.
- All workers and management must undergo an induction course.
- A building zone must be defined consisting of a panel footprint and a 1.5m buffer strip.
- All road construction must be limited to the road reserve.
- Any natural habitat destroyed by constructing infrastructure should be rehabilitated.
- Stock piles must be screened off from general view and liquids must not leach into the open space systems.
- Dust creation must be controlled.
- Access must be on recognised routes.
- Litter and littering must be strictly controlled.
- All construction waste and building rubble must be removed off site.

- Construction workers are not allowed to hunt or gather wood.
- Cut and fill should be kept to a minimum and should be rehabilitated immediately.
- The overall development must adhere to the ethos of Danielskuil and all mitigation measures related to construction should be adhered to.
- The comprehensive lighting guidelines should be developed and implemented.
- Visual standards should be maintained by means of the baseline photograph as recommended in the Visual impact assessment.

#### **5.4 Conclusion**

The above management guidelines have been presented in terms of the specific social constraints that might result due to the proposed Roma Energy Danielskuil (Pty) Ltd Photovoltaic Energy Generation Facility and related infrastructure. These guidelines direct a basic model which could be changed to have overall better outcomes and requiring only some of these guidelines. These guidelines aim to change the social constraints of the proposed development into benefits in favour of the local community of Danielskuil and the community within the Kgatelopele Municipal area.

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