Socio- Economic Impact Assessment of Amended 2017 Solar Energy Facility Proposal, Kakamas

For

Keren Energy Kakamas (Pty) Ltd

In support of the Environmental Basic Assessment Report by Enviro Africa, Helderberg.

Compiled by

leap sustainable development
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Reports

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

Executive Summary

In 2012 EnviroAfrica cc, was appointed by Keren Energy Kakamas (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on Erf 1654, Kakamas, 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

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 receiving environment 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 one 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 (N14).
   - Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
   - Natural environment as increased dust and noise levels will decrease air quality.
   - Community resources: archaeological, palaeontolgical and sense of place.
     Sense of Place: This impact is of a temporary nature.

   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, palaeontolgical and sense of place.
     Sense of Place: Changes in quality of living environment

c) The community will experience the following environments to be under stress and mitigation is indirect:
   - The employment sector as more people will migrate into Kakamas 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.

The cumulative impacts are positive, and the slightly negative impacts (sense of place and stress on authority services) are anticipated and can be mitigated to support the positive impacts. 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.

Therefore the proposed development is supported form a socio-economic perspective.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorization and waste management license in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

Roma Energy Kakamas (Pty) Ltd: Proposed 5MW Photovoltaic Energy Generation Plant

Specialist:	Anelia Coetzee		
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4.2 The specialist appointed in terms of the Regulations_

I, Anelia Coetzee declare that –

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct; and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

Leap Sustainable Development cc
Name of company (if applicable):

23 March 2017
Date:

Background

In 2012 EnviroAfrica cc, was appointed by Keren Energy Kakamas (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Erf 1654, Kakamas, just south of the town, Kai Garib Municipality, 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

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)

Keren Energy Kakamas (Pty) Ltd intends to construct a 5 MW solar photovoltaic (PV) energy generation facility on Erf 1654, Kakamas, just south of the town, Kai Garib Municipality, Northern Cape. Erf 1654 is owned by Kai Garib Municipality and zoned Agriculture 1.

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 facility will be connected to Eskom's Taaipit Substation using 22kV power lines similar to telephone lines in extent.

Comparison between 2012 and 2017 proposal

Changes in the receiving environment 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 ±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 ±1.5m above ground	Shorter axis, down scaling of size of infrastructure
	- Approximately 1.8ha is required to install 1MW. (Thus 10MV 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 approximately15, 64m.	Module: 1.956m x 0.992m Module String: 20 x 1.956m x 0.992m = ±40m x ±20m Height tracking vertically: ±10.5m	Maximum height lower
- Mounting	- CPV panels will be mounted on pedestals drilled & 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 form 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: Taaipit	The powerlines 22kV (similar to telephone line) to Eskom Taaipit Substation.	None
- Access	- Site will be accessed from N14, using existing secondary roads. Additional temporary access roads will have to be established on site.	Site will be accessed from N14.	None
- Location, Ownership, extent	- To be established on 20ha of land on Erf 1654 is owned by Kai Garib Municipality and zoned Agriculture 1	10h to be established on 20ha of land on Erf 1654 is owned by Kai Garib Municipality and zoned Agriculture 1.	None
- Changes in receiving environment		No changes occurred in receiving environment.	None

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) Medium negative (influx of people)
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: A highly dispersed scatter of Later Stone Age (LSA) and Middle Stone Age (MSA) implements (cores and scrapers) were recorded. The material was encountered on loose, degraded quartz gravels. The majority of the resources are in banded ironstone, with the remainder in quartz, quartzite and indurated shale. The archaeological remains were graded as having low (3C) significance. No mitigation is required.	Low	Low	Low	Low There is only one other renewable energy (RE) project planned. No impact as surrounding area is not a sensitive archaeological landscape Kakamas Waste Water Treatment Plant (to be upgraded) is located about 500m south west of the development site. An old quarry located about 200m south of the development site.

	Palaeontological Erf 1654 is underlain by ancient Precambrian basement rocks approximately one to two billion years old and entirely unfossiliferous. They are mantled by Late Caenozoic sandy soils, surface gravels and possibly calcretes; Fluvial gravels of the Orange River system are unlikely to be represented here.	Low	Low	Low	Low These unfossiliferous metamorphic basement rocks (granite-gneisses *etc.*) and superficial sediments are of low palaeontological sensitivity.
	Sense of Place Waste Water Treatment plant and old quarry in close proximity.	Temporary, low		Temporary, low	Temporary, low

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 (N14).
   - Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
   - Natural environment as increased dust and noise levels will decrease air quality.
   - Community resources: archaeological, palaeontolgical and sense of place.
     Sense of Place: This impact is of a temporary nature.

f) The community will experience the following environments to be under stress and mitigation is indirect:
   - The employment sector as more people will migrate into Kakamas 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 / job opportunities will be generated	- Jobs will be created (specifically security services)	Low, positive	Medium, positive	Medium, positive	Medium, positive Medium negative (influx)
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)	Sense of Place: N14 & R 359 Approaching from west (N14) travelers are not inclined to look in direction of site. The road is lower that the site and a series of rises in between, screen the site from the road. The powerlines (similar to telephone line) may be visible at short intervals.	Low, negative	Low, negative	Low, negative (no mitigation proposed)	Low, negative One other proposed sites. As site is adjacent to commonage, which is home to wastewater and refuse infrastructure and cultivation landscape, it is located on edge of urban development, it potentially can attract further development.
Enhanced tourism causing changes in economic and material well being		Low	Low	Low	Low

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.
   - Skills levels will increase
   - 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, palaeontolgical and sense of place.
     Sense of Place and acceptable changes in quality of living environment is likely as the remainder of the site on which the proposed development is located, is currently used for a range of utility type land uses (waste water treatment and old quarry). The proposed solar farm seems to be in character with these elements. As the proposed development is located on the edge of the town, other similar developments could be established in the vicinity. These changes are rated within acceptable levels.

i) The community will experience the following environments to be under stress and mitigation is indirect:
   - The employment sector as more people will migrate into Kakamas 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.

The cumulative impacts are positive, and the slightly negative impacts (sense of place and stress on authority services) are anticipated and can be mitigated to support the positive impacts. 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.

Therefore the proposed development is supported form a socio-economic perspective.

References

Almond, J.E. 2017: Recommended exemption from further palaeontolgical studies & mitigation: Proposed Kakamas Keren Energy Solar Plan, Kai Garib Local Municipality, Northern Cape

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

Goestratics, 2017: Kakamas, Portion Erf 1654, Solar Energy Facility: Visual Assessment