

Socio- Economic Impact Assessment Amended 2017 Solar Energy Facility Proposal: Van Rhynsdorp
For
Roma Energy Van Rhynsdorp (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 Van Rhynsdorp (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Remainder of Farm Duinen No 258, Van Rhynsdorp, Matzikama 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.

Roma Energy Van Rhynsdorp (Pty) Ltd now intends to construct a 5 MW Photovoltaic (CPV) Energy Generation Facility on Duinen Remainder of Farm 258, Van Rhynsdorp and applications have to be made afresh. This report represents a Socio- Economic Impact Assessment of the amended 2017 Solar Energy Facility Proposal, van Rhynsdorp.

Farm Duinen258, situated on the northern outskirts of Van Rhynsdorp, is owned by Matzikama Municipality and zoned Agriculture 1.

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, yet 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 six other renewable projects planned have the following results for both the construction and operational phases:

- a) The community will experience positive changes in their economic and material well-being as
 - More jobs 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 (N7 and R27).
 - 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, palaeontological and sense of place: The presence of large earth moving equipment, which is temporary and not uncommon.
- 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.
- Although the site has moved slightly northwards, changes in the Sense of Place and in quality of living environment is viewed as not having any space crowding and or compounding impact and hold no significant visual impacts to deem the development undesirable. The solar facility links to the adjacent Vanrhynsdorp substation with 22kV power lines and thus add no additional elements to the original assessment. The site situated outside the urban edge but within a visual context of the urban environment, will change the character of the immediate surrounds, however within acceptable levels.
- The viewshed does not extend as far as the Moedverloor Reserve. Van Rhynsdorp is located higher up on the slope of the Troe-Troe Valley than the proposed site, 1.5km from town, but behind the rise in the land. The catchment area does not extend to 30 km. Other sites within the 30km radius are spatially removed from the application and will therefore not cause crowding.
- The N7 southbound present the only receptor which pose a potential visual impact of significance but due to the short duration it is regarded as of lesser significance and within acceptable levels. No mitigation is required and the overall the visual impact of the development is of low significance.
- The propose development does not pose any significant cumulative visual impacts which would deem the proposal unacceptable.
- 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 Van Rhynsdorp 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.

There are no cumulative impacts or 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 from a socio-economic perspective.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

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

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|---|
| Roma Energy van Rhynsdorp (Pty) Ltd: Proposed 5MW Photovoltaic Energy Generation Plant |
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| | | | |
|--------------------------------------|-------------------|-------|-------------|
| Specialist: | Anelia Coetzee | | |
| Contact | P.O. Box 488 | | |
| person: Postal | Malmesbury | | |
| address: | 7299 | Cell: | 082 3394338 |
| Postal code: | | Fax: | 022 4871661 |
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| Professional affiliation(s) (if any) | | | |

| | | | |
|-----------------|-----------------|-------|-------------|
| Project | EnviroAfrica | | |
| Consultant: | Bernard De Witt | | |
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| Telephone: | | | |
| E-mail: | | | |

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 Roma Energy Van Rhynsdorp (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Remainder of Farm Duinen No 258, Van Rhynsdorp, Matzikama 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.

Roma Energy Van Rhynsdorp (Pty) Ltd now intends to construct a 5 MW Photovoltaic (CPV) Energy Generation Facility on Duinen Remainder of Farm 258, Van Rhynsdorp and applications have to be made afresh. This report represents a Socio-Economic Impact Assessment of the amended 2017 Solar Energy Facility Proposal, van Rhynsdorp.

Farm Duinen258, situated on the northern outskirts of Van Rhynsdorp, is owned by Matzikama Municipality and zoned Agriculture 1.

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 Van Rhynsdorp (Pty) Ltd intends to construct a 5 MW solar photovoltaic (PV) energy generation facility on Remainder of Farm Duinen No 258, Van Rhynsdorp, north of the town, Matzikama Municipality, Northern Cape.

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 solar facility links to the adjacent Vanrhynsdorp substation with 22kV power lines.

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 yet 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 ± 66 kV. 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 then 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 ± 1.5 m 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 = ± 40 m x ± 20 m Height tracking vertically: ± 10.5 m | 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: Van Rhynsdorp. | Fed into Eskom Van Rhynsdorp substation, adjacent to Remainder of Farm Duinen 258, Van Rhynsdorp. | None |
| - Access | - Site will be accessed from a gravel road, via the N7 and R27, using existing secondary roads. Additional temporary access roads will have to be established on site. | Site will be accessed from a gravel road via the N7 and R27. | None |
| - Location, Ownership, extent | - To be established on 20ha of land on Remainder of Farm Duinen 258 is owned by Matzikama Municipality and zoned Agriculture 1 | 10h to be established on 20ha of land on Remainder of Farm Duinen 258 is owned by Matzikama Municipality and zoned Agriculture 1. | None |
| - Changes in receiving environment | | Since 2012, no development of the receiving environment took place. | 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 some impacts 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: 114 archaeological tools and remains found were assigned to the Middle Stone Age (MSA), Later Stone Age (LSA), including two Early Stone Age (ESA) flakes. Most of the tools comprised single, dispersed and isolated occurrences with a few clustered on higher elevations overlooking the floodplain of the Droerivier. | Low | Low | Low | Low renewable energy (RE) projects planned: will not impact on archaeological resources |
| | Palaeontological Proposed development is underlain by superficial sands | Low | Low | Low | Low Cumulative impacts posed by the |

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|--|--|----------------|-----|----------|--|
| | (weathered and highly deformed metasediments of the Gariep Supergroup (possibly Aties Formation) that are mantled by calcareous and gypsiferous soils). of low palaeontological sensitivity; Extensive, deep excavations are unlikely to be involved in this sort of solar park project. | | | | Vanrhynsdorp Roma solar plant and other developments in the Vanrhynsdorp region on very sparse local fossil assemblages are low. |
| | Agricultural land Low potential agricultural soil, yet storm water management measures is required to control erosion | Low | Low | Low | None |
| | Botanical Resources Vanrhynsdorp Ganabosveld, least threatened. The site is located within an ecological support area or water recharge area. Mitigation measures are required and should be implemented. | Low | Low | Very Low | None |
| | Sense of Place | Temporary, Low | Low | Low | None |

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

Summary of Cumulative Impacts:

According to the Department of Environmental Affairs (DEA) Renewable Energy EIA Application Database for renewable projects (new builds), there are at least six (6) approved renewable energy (RE) (i.e. wind & solar) projects planned within a 30km radius of Vanrhynsdorp.

The cumulative impacts of the propose development and six 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 (N7 and R27).
 - 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, palaeontoligical and sense of place. The presence of large earth moving equipment, which is temporary and not uncommon.
- 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 Van Rhynsdorp 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) | Sense of Place: | Low, negative | Low, negative | Low, negative (no mitigation proposed) | Low, negative No significant cumulative visual impacts. |
| Enhanced tourism causing changes in economic and material well being | | Low | Low | Low, positive | Medium positive |

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 proposed development and six other renewable projects (wind and solar) approved within a 30km radius of Vanrhynsdorp has the following results:

- g) The community will experience positive changes in their economic and material well-being as
 - More jobs 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, palaeontological and sense of place: Although the site has moved slightly northwards, changes in the Sense of Place and in quality of living environment is viewed as not having any space crowding and or compounding (cumulative) impact and hold no significant visual impacts to deem the development undesirable. The solar facility links to the adjacent Vanrhynsdorp substation with 22kV power lines and thus add no additional elements to the original assessment. The site situated outside the urban edge but within a visual context of the urban environment, will change the character of the immediate surrounds, however within acceptable levels.

The viewshed does not extend as far as the Moedverloor Reserve. Van Rhynsdorp is located higher up on the slope of the Troe-Troe Valley than the proposed site, 1.5km from town, but behind the rise in the land. The catchment area does not extend to 30 km. Other sites within the 30km radius are spatially removed from the application and will therefore not cause crowding.

The N7 southbound present the only receptor which pose a potential visual impact of significance but due to the short duration it is regarded as of lesser significance and within acceptable levels. No mitigation is required.
- 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 Van Rhynsdorp 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, or 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 palaeontological studies & mitigation: Proposed Van Rhynsdorp Roma Energy Solar Plan, Matzikama Local Municipality, Northern Cape

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

Goestratics, 2017: Van Rhynsdorp, Portion Remainder of Farm Duinen 258, Solar Energy Facility: Visual Assessment