

Vryburg Solar 1, North West Province

Motivation for Amendment of the Environmental Authorisation

Final Motivation Report

DEA Ref.: 14/12/16/3/3/1/1939

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PROJECT DETAILS

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PURPOSE OF THE REPORT

Environmental Authorisation (EA) for the Vryburg solar 1 energy facility in the North West Province (DEA Ref: 14/12/16/3/3/1/1939) was obtained by Vryburg Solar 1 (Pty) Ltd on 6 December 2018. The project was authorised by the Department of Environment, Forestry and Fisheries (DEFF)¹ for the development of a solar PV facility with a contracted capacity of up to 115MW and associated infrastructure on the following farm portions:

- » Portion 2 of Frankfort Farm 672;
- » Remainder of Frankfort Farm 672;
- » Portion 1 of Frankfort Number Farm 672; and
- » Remainder of Rosendal Farm 673.

Due to the demand in the utilisation of battery energy storage systems for renewable energy projects, as well as to ensure an adequate supply of electricity to the national grid, Vryburg Solar 1 (Pty) Ltd is proposing the construction and operation of a Battery Energy Storage (BESS) with a capacity of up to 500MW/500MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within the authorised construction compound/laydown area of the solar energy facility and with an extent of no more than 5ha.

It is the Developer's intention to bid the solar PV facility, including the battery energy storage system, under the Risk Mitigation Independent Power Producer (IPP) Procurement Programme and/or Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) of the Department of Mineral Resources and Energy (DMRE) and/or any future relevant procurement programme. Ultimately, the development of the solar PV facility as well as the BESS is intended to be part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resources Plan (IRP). For solar energy to be dispatchable it will require the additional battery energy storage applied for in this amendment.

Additionally, the contact details of the EA Holder have changed. Therefore, the applicant is lodging a request to amend the details to ensure that the EA lists the contact details of the EA Holder correctly. In addition, Vryburg Solar 1 (Pty) Ltd is proposing a change in the description included in the Environmental Authorisation pertaining to the on-site substation. The change relates to the addition of collector infrastructure as part of the authorised on-site substation and within the authorised footprint of the substation.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 (as amended on 07 April 2017 and 13 July 2018), it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved. The proposed amendments for the construction and operation of the BESS, the change in the description included in the Environmental Authorisation pertaining to the on-site substation as well as the amendment to request to amend the details to ensure that the EA lists the contact details of the EA Holder correctly, do not trigger any new listed activities. The BESS will be located within the originally authorised footprint of the solar energy facility, within the already authorised construction compound/laydown area as assessed during the Basic Assessment (BA) process.

Savannah Environmental has prepared this Final Motivation Report in support of the application for the proposed amendments on behalf Vryburg Solar 1 (Pty) Ltd. This report aims to provide detail pertaining to

¹ Then known as the Department of Environmental Affairs (DEA).

the environmental impacts as a result of the proposed amendment in order for interested and affected parties to be informed and submit comments for the competent authority to be able to reach a decision in this regard. This report is supported by specialist input letters to inform the conclusion and recommendations regarding the proposed amendment (refer to **Appendix A to F** of this report). This Final Motivation Report must be read together with these specialist input letters in order to obtain a complete understanding of the proposed amendment and the implications thereof from an environmental perspective.

The Motivation Report was made available for a 30-day review and comment period in accordance with Regulation 32(1)(aa) of the EIA Regulations, 2014 (as amended) from **Friday, 30 October 2020** to **Monday, 30 November 2020**. The availability of the Motivation Report for the 30-day comment and review period was advertised in the Stellander Newspaper on **Wednesday, 28 October 2020** (refer to **Appendix G4** of the Motivation Report).

The Motivation Report was made available for download from Savannah Environmental's website: <https://www.savannahsa.com/public-documents/energy-generation/vryburg-solar-1-2-3-facilities/>. All comments received during the 30-day review and comment period have been included within a Comments and Responses Report (C&RR) submitted to DEFF as part of this Final Motivation Report.

1. OVERVIEW OF THE PROJECT

1.1. Location

The authorised Vryburg Solar 1 energy facility is located 10km south-west of Vryburg in the North West Province (refer to **Figure 1.1**). The project is located within the Vryburg Renewable Energy Development Zone (REDZ 6), within ward 4 of the Naledi Local Municipality and within the greater Dr Ruth Segomotsi Mompati District Municipality.

The development footprint of the solar PV facility is located on the following farm portions:

- » Portion 2 of Frankfort Farm 672;
- » Remainder of Frankfort Farm 672;
- » Portion 1 of Frankfort Number Farm 672; and
- » Remainder of Rosendal Farm 673

The following infrastructure components were authorised by the Department during the BA process:

- » Arrays of PV panels with a contracted capacity of up to 115MW.
- » Mounting structures to support the PV panels.
- » Cabling between the project components, to be laid underground where practical.
- » 35-45 on-site central inverter stations to convert the power from a direct current (DC) to an alternating current (AC).
- » An on-site substation (including lightening conductor poles) to facilitate the connection between the solar PV facility and the Eskom electricity grid.
- » 132kV overhead distribution line (single or double circuit) to connect to the existing Eskom Mookodi substation.
- » Associated electrical infrastructure at the Eskom Mookodi substation (including but not limited to feeders and busbars at the Eskom Mookodi substation.
- » Internal distribution lines of up to 33kV.
- » Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- » Temporary laydown areas and stormwater channels.
- » Internal access roads and fencing around the project site.
- » Access road to the site.
- » Other infrastructure including but not limited to workshop areas for maintenance, storage, and offices.

1.2. Potential Environmental Impacts as determined through the BA Process

From the specialist investigations undertaken within the BA process for Vryburg Solar 1 (CSIR, 2018), the following environmental impacts relevant to the amendment application were identified:

- » Impacts on Ecology (Terrestrial and Aquatic)
- » Impacts on Avifauna
- » Soil and Agricultural Potential Impacts
- » Heritage Impacts
- » Palaeontological
- » Visual Impacts
- » Impacts on the Social Environment

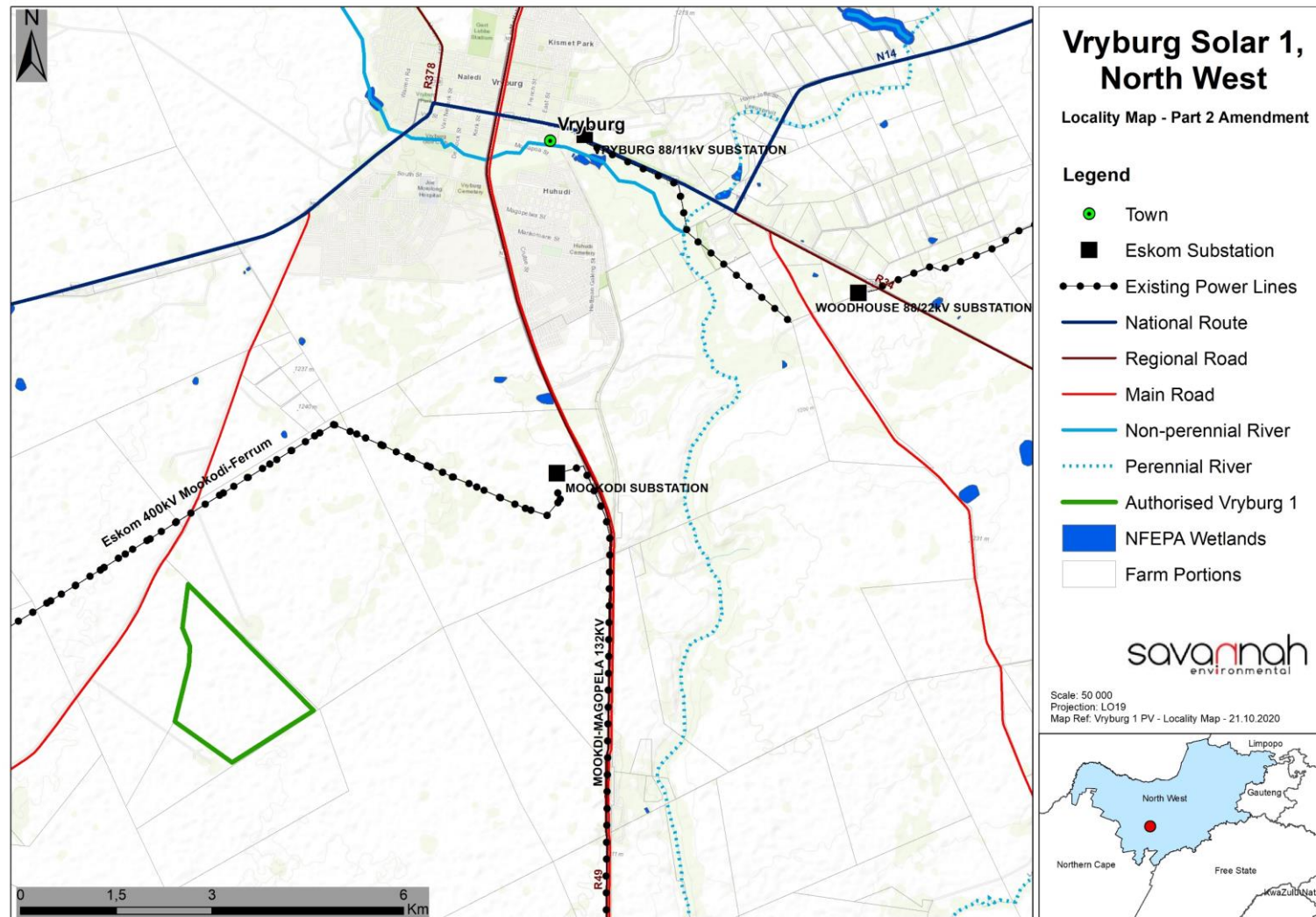


Figure 1.1: Map showing the location of the Authorised Vryburg 1 Solar Facility footprint. A3 maps have been included in **Appendix H** of the Final Motivation Report.

Key conclusions and recommendations of the original BAR pertinent to this application, as reported in the Final BAR Report (CSIR, 2018):

1.2.1. Summary of environmental findings

The BA Report found that, based on the nature and extent of the project, the level of disturbance predicted as a result of the construction and operation of the solar energy facility and the associated infrastructure was assessed as low to moderate and that the impacts associated with the proposed development could be managed and mitigated to an acceptable level. No fatal flaws were identified to be associated with Vryburg Solar 1 and associated infrastructure.

1.2.2. Impacts on Ecology (Terrestrial and Aquatic)

The ecological impact assessment conducted for Vryburg Solar 1 determined that the footprint proposed for the development was not part of a threatened ecosystem or freshwater ecosystem priority area. Presence of resident Threatened or Near Threatened plants, mammals, reptiles, amphibians and invertebrates at the site was unlikely. Additionally, a Protected tree species, which was not Threatened but listed as Declining, *Vachellia erioloba* (Camel Thorn) occurred in relatively low numbers (average 0,08 trees/ha) at the site. Camel Thorn forests or any large Camel Thorn individuals of note were absent at the site.

Overall, the sensitivity at the site was concluded to be moderate apart from a small wetland depression which, with its buffer zone, was regarded as high sensitivity and accordingly was set aside as a no-go zone for any developments. Overall, negative impacts on habitat loss, sensitive species and connectivity were assessed as moderate and within scope of mitigations. In cases such as this study, where proposed footprints are relatively small parts of fairly similar habitat in the larger area, the ecological impact assessment determined that there was no distinct reason why the proposed development cannot take place and relieve pressure to use other energy sources which are perhaps more detrimental to sensitive environments.

The results of the ecological impact assessment revealed one key issue, which was to avoid the establishment of alien invasive plant species in particular Declared Weeds such as *Prosopis* (Mesquite) during the development of the project.

1.2.3. Impacts on Avifauna

The Avifauna impact assessment conducted for Vryburg Solar 1 determined that the overall negative impacts to avifauna, following the implementation of the required mitigation measures, were considered to be low to very low. No fatal flaws were identified from an avifaunal perspective. The results of the Avifauna impact assessment therefore recommended that the project should be authorised.

1.2.4. Impacts on Soil and Agricultural Potential

The Soils and Agricultural Impact Assessment conducted for Vryburg Solar 1 determined that all impacts assessed had low or very low significance. The cumulative impact was assessed as low, predominantly because of the low agricultural potential of the area.

The development is located within a REDZ which has been declared precisely because it is an environment that can accommodate numerous renewable energy developments without exceeding acceptable levels

of agricultural land use loss. Due to the low agricultural potential of the site, and the consequent low agricultural impact, there were no restrictions relating to agriculture which preclude authorisation of the proposed development.

The results of the Soils and Agricultural Impact Assessment therefore recommended that from an agricultural impact point of view, the development should be authorised.

1.2.5. Impacts on Heritage Resources

The Heritage Impact Assessment conducted for Vryburg Solar 1 determined the cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age and Iron Age) occupation and a much later colonial (farmer) component. The second component is an urban one consisting of a number of smaller towns, most of which developed during the last 150 years or less.

Identified sites included:

- » Stone tools were identified to occur on a low ridge to the east of the substation. It mostly dated to the Middle Stone Age, although some smaller ones might date to the Later Stone Age. Cores, tools and flakes (debitage) were identified, indicating that the tools were manufactured on site.
- » Originally some graves (c. 6) occurred west of the substation. They were very old and only marked with low stone cairns. As they were located next to the laydown area for the construction of the substation, they were fenced off. They could not be located during the current site visit (possibly due to incorrect coordinates). It is also possible that they were relocated during the construction activities.

The Heritage Impact Assessment concluded that the potential impact of the proposed development on these sites would be low. The results of the Heritage Impact Assessment therefore recommended that no heritage permits were required, unless indicated otherwise by SAHRA. From a heritage point of view, it was recommended that the development be allowed to continue on acceptance of the mitigation measures included in the assessment.

1.2.6. Impacts on Palaeontology

The Palaeontological Impact Assessment conducted for Vryburg Solar 1 determined the proposed development of the PV facility will take place in an area which is considered to have mostly a High Palaeontological Sensitivity for the PV facility site, and areas of Medium, High and Very High Palaeontological Sensitivity within the grid connection corridor. The Palaeontological Impact Assessment recommended that a Chance Find Procedure should be followed if fossils are uncovered during construction.

The overall impact to palaeontology, following the implementation of the required mitigation measures was considered to be moderate for the eastern part of the grid connection corridor during the construction and very low for any impact to fossils during the operational and decommissioning phases.

1.2.7. Visual Impacts

The Visual Impact Assessment conducted for Vryburg Solar 1 determined the landscape surrounding the proposed site to have a peri-urban character which is typified by a mixture of urban and rural elements such

as buildings, electrical infrastructure, commercial farming, as well as large scale developments which do not fit into an urban landscape. The landscape was also transitional and changes as the town expands.

Visual intrusion on the existing views of highly sensitive visual receptors by the introduction of a solar energy facility into the landscape will be moderate since the development will be noticed, but the quality of views is already compromised by existing structures associated with an urban and peri-urban landscape. The significance of this visual impact is expected to be moderate before mitigation and low if mitigation is successful. Mitigation measures should lower the consequence of the impact from substantial to moderate and the significance of the impact to low.

Furthermore the Visual Impact Assessment determined that the significance of the impact of night lighting of the facility on the nightscape (during the operational phase) is likely to be moderate since the nightscape is relatively dark and new lights will be introduced. Mitigation measures will reduce the potential for light pollution and glare and should lower the significance of the potential impact to low. The significance of cumulative impacts on the surrounding landscape character is very low since the landscape character most likely to be affected is peri-urban which should be able to absorb the proposed developments without changing significantly. The significance of the cumulative visual impact on sensitive visual receptors is low due to the limited potential for scenic or highly valued views in the region.

The results of the Visual Impact Assessment therefore indicated that in the opinion of the visual specialist the project should be authorised with adherence to mitigation measures as set out in the report, since the significance of the overall visual impact of the project is expected to be low.

1.2.8. Social Impacts

The Social Impact Assessment conducted for Vryburg Solar 1 determined the overall social impact, post mitigation, is considered to be low (negative) during the construction and decommissioning phases and very low (positive) during the operational phase. The cumulative impacts identified for the proposed project revolve around the social change process likely to occur should more than one renewable energy project be developed within the proposed project area.

The primary concern in this regard was the cumulative change that existing social structures might be exposed to due to influxes of large construction teams and job seekers, as well as the cumulative impact such influxes might have on the local HIV/AIDS infection rate. Conversely, the key positive cumulative impact was the combined benefit likely to vest in the local community as a result of the Community Trusts of various renewable energy projects being developed in the area.

In light of the overall low significance (post mitigation) rating of identified negative impacts, and having regard to the nature of such impacts, and the status quo socio-economic conditions present in the Naledi Local Municipality, the socio-economic benefits of the project were concluded to outweigh its impacts.

It was therefore the opinion of the social specialist that should the mitigation measures be implemented as prescribed in the assessment; it was recommended that the proposed development be awarded environmental authorisation.

2. OVERVIEW OF THE PROPOSED AMENDMENTS

The amendments being applied for relate to the project description, as well as a change in the contact details of the contact person of the EA holder, as detailed in the EA dated 6 December 2018. The requested amendments will result in the construction and operation of a BESS with a capacity of up to 500MW/500MWh within the authorised development footprint of Vryburg Solar 1, as well as the addition of collector infrastructure to the authorised on-site substation.

This section of the Final Motivation Report details the amendment considered within this report and by the specialist investigations (refer to **Appendix A – F**). Each amendment request is detailed below.

2.1. A change to the details of the contact person of the EA holder

The details of the contact details of the EA Holder have changed. Therefore, the applicant is lodging a request to amend the details to ensure that the EA lists the contact details of the EA Holder correctly.

EA Page Reference	Current Authorised Details	Amended / Corrected details
EA Cover Page (page 1)	Tel: 064 030 3633 E-mail: Robert.wagener@abo-wind.com	Tel: 021 276 3620 E-mail: capetown@abo-wind.com
Page 2 of the EA (Activities authorised)	Cell: (064) 030 3633 E-mail: Robert.wagener@abo-wind.com	Cell: 076 104 1372 E-mail: capetown@abo-wind.com

2.2. An update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS)

The applicant is requesting an update to the project description within the EA to include the construction and operation of a Battery Energy Storage System (BESS) with a capacity of up to 500MW/500Wh within the authorised development footprint of the solar energy facility (refer to **Figure 2.1**). The BESS will be developed on Portion 2 of Frankfort Farm 672, within the authorised development footprint of Vryburg Solar 1. It is proposed that the BESS is located within the authorised construction compound/laydown area and with an extent of no more than 5ha. The BESS will connect to the authorised on-site facility substation of Vryburg Solar 1 via multi-core 22kV or 33kV underground cables (to follow the internal access roads of the authorised PV facility).

The following amendments have been requested to the EA:

EA Page Reference	Proposed wording
Page 8, Associated Infrastructure	» Battery Energy Storage System (coordinates: 27°1'53.34"S ; 24°41'18.47"E)
Page 8, Electrical Infrastructure	» Electrochemical battery storage systems with a maximum height of 3.5m; and » Multi-core 22kV or 33kV underground cables, to follow internal access roads of the PV facility, to connect the battery storage area to the on-site facility substation.

2.3. A change in the description included in the Environmental Authorisation pertaining to the on-site substation

In addition, Vryburg Solar 1 (Pty) Ltd is proposing a change in the description included in the Environmental Authorisation pertaining to the on-site substation. The change relates to the addition of collector infrastructure as part of the authorised on-site substation and within the authorised footprint of the substation.

The following amendments have been requested to the EA:

EA Page Reference	Proposed wording
Page 8, Associated Infrastructure	» On-Site substation and collector infrastructure

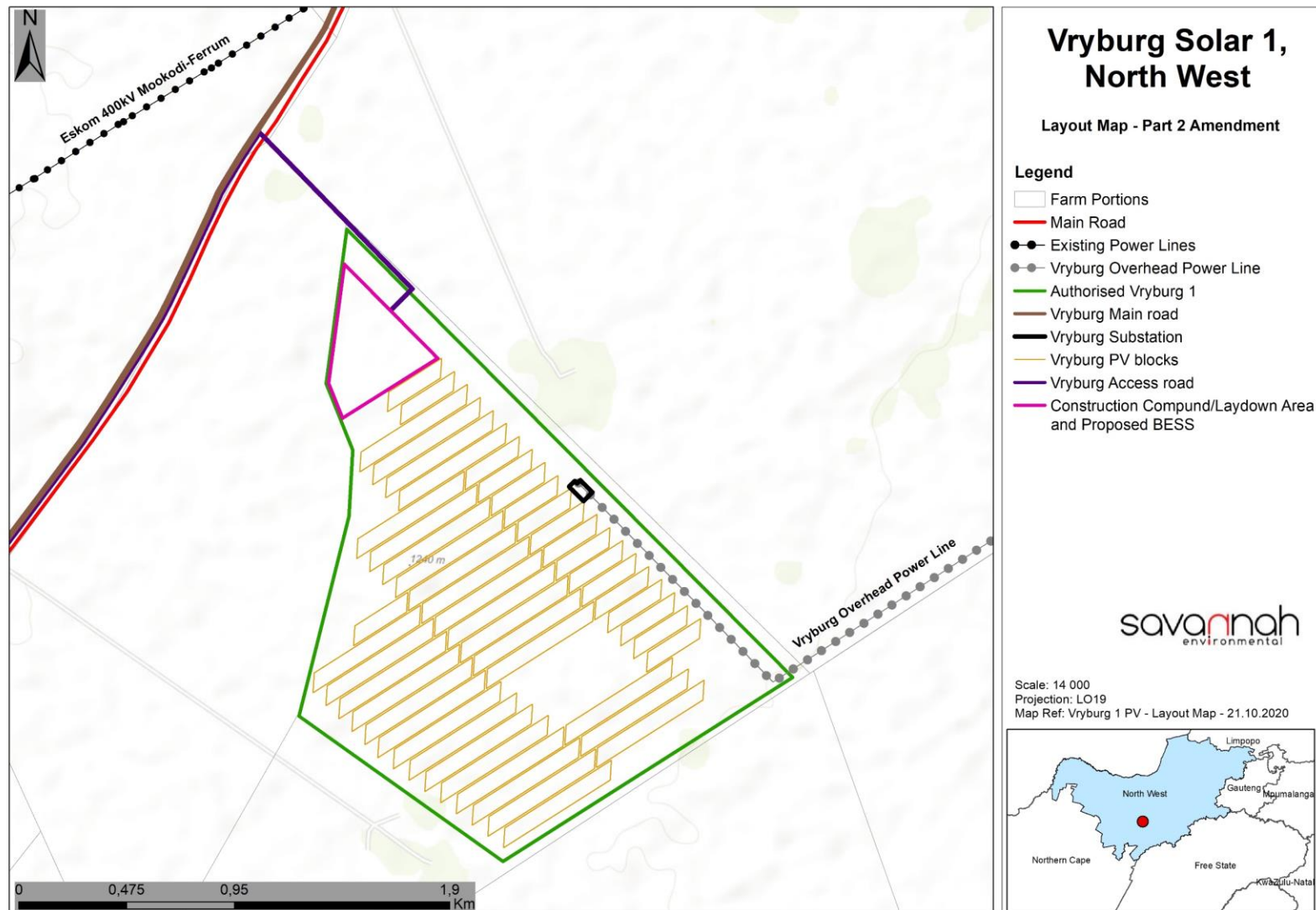


Figure 2.1: Map showing the layout of the BESS within the authorised development footprint of Vryburg Solar 1. A3 maps have been included in **Appendix H** of the Final Motivation Report.

3. MOTIVATION FOR THE PROPOSED AMENDMENTS

The sections below describe the motivation for each of the requested amendment.

3.1. A change in the details of the contact person of the EA Holder

The contact details of the EA Holder have changed. Therefore, the applicant is requesting to amend the details to ensure that the EA lists the contact details of the EA Holder correctly.

3.2. An update to the project description of the EA to include the construction and operation of Battery Energy Storage System (BESS)

The applicant is requesting an update to the project description of the EA to include the construction and operation of a BESS with a contracted capacity of up to 500MW/500MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within the authorised laydown area, and with an extent of no more than 5ha.

The general purpose and utilisation of the BESS will be to save and store excess electrical output from the solar energy facility as it is generated, allowing for a timed release to the national grid when the capacity is required. The BESS will therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand and will allow for longer generating periods of the solar PV facility. Furthermore, the development of the BESS for the project is of importance as the system will ensure that electricity is fed into the national grid when required and excess amounts stored. This will allow for extended hours of generation from the 115MW solar energy facility.

3.3. A change in the description included in the Environmental Authorisation pertaining to the on-site substation

Vryburg Solar 1 (Pty) Ltd requires the use of additional collector infrastructure to the already authorised on-site substation. This will allow for the generated electricity of other projects to be collected at the on-site substation, enabling the electricity to be transported by a single overhead power line (instead of multiple overhead power line) to the grid connection point which is the Mookodi substation. The amendment of the on-site substation description will therefore allow for only one overhead power line to be developed within the area for multiple projects (where successful). This amendment will provide an opportunity for a reduced need to develop individual overhead power lines in the area for each successful project, which will in turn reduce the environmental impact associated with the development of power line infrastructure.

Vryburg Solar 1 (Pty) Ltd is therefore proposing a change in the description included in the Environmental Authorisation pertaining to the on-site substation. The change relates to the addition of collector infrastructure as part of the authorised on-site substation and within the authorised footprint of the substation.

4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS

In terms of Regulation 31 of the EIA Regulations 2014, as amended, an environmental authorisation may be amended by following the process in this Part (i.e. a Part 2 amendment) if it is expected that the amendments may result in an increased level or change in the nature of impact where such level or change in nature of impact was not:

- a) Assessed and included in the initial application for environmental authorisation; or
- b) Taken into consideration in the initial authorisation.

The amendments to develop a BESS with a capacity of up to 500MW/500MWh, and the change in the description included in the EA pertaining to the on-site substation were not specified or considered in the initial environmental authorisation. The requested amendments do not on their own, constitute a listed or specified activity. Therefore, the application is made in terms of Regulation 31(b) of the EIA Regulations, 2014.

5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE BA REPORT AS A RESULT OF THE PROPOSED AMENDMENT

In terms of Regulation 32(1)(a)(i), the following section provides an assessment of the impacts related to the proposed amendment. Understanding the nature of the proposed amendment and the impacts associated with the project (as assessed within the BA Report), the following has been considered:

- » Impacts on Ecology (including fauna and flora)
- » Impacts on Avifauna
- » Soil and Agricultural Potential Impacts
- » Heritage Impacts (including palaeontology)
- » Visual Impacts
- » Impacts on the Social Environment

Impacts from a traffic perspective have not been considered as no change in impact will occur and therefore the results and recommendations of the Traffic Impact Assessment undertaken within the BA Report are considered to be relevant to the proposed amendment.

All specialist studies assessed the proposed addition of the BESS and collector infrastructure in the following manner:

- » All potential impacts related to the proposed changes were identified.
- » The advantages and disadvantages associated with the changes were considered.
- » A comparative assessment of the impacts before the changes and after the changes were made.
- » Measures to ensure avoidance, management and mitigation of impacts associated with such proposed changes, and any potential changes to the EMPr were considered.

The potential for change in the significance and/or nature of impacts based on the proposed amendment as described within this Final Motivation Report is discussed below and detailed in the specialists' assessment addendum letters included in **Appendix A - F**². This section of the Final Motivation Report must be read together with the specialist addendum letters contained in Appendix **A - F** in order for the reader to obtain a complete understanding of the proposed amendment and the implications thereof.

5.1. Impacts on Ecology (including flora and fauna)

The Ecological Specialist Addendum Letter (**Appendix A**) included a review and assessment of the original Ecological Impact Assessment and data, as well as the update of any previously assessed impacts and additional mitigation measures, where required.

The proposed laydown area of the Battery Energy Storage System (BESS) and collector infrastructure are located within the Vryburg Solar 1 Site of which the ecology (terrestrial and aquatic) has been surveyed previously. The following was concluded:

² It must be noted that the original specialists who undertook the BAR studies have been used for this assessment as far as possible. However, where the original specialists were not available for whatever reason, suitably qualified and experienced specialists have been used to provide an assessment of the proposed amendment.

- » The outcomes of the previous report do not need any changes in terms of the findings, risks, mitigations and recommendations as a result of the proposed amendments.
- » The permit for removal of the protected tree species *Vachellia erioloba* (Camel Thorn Tree) has been successfully applied for following the ecological survey at the proposed Vryburg Solar 1 site and was issued for the entire site. Therefore, there is no need for reassessment and no need for any other application for any additional removal of protected tree species.
- » As the BESS and collector substation components are located within the authorised footprint of the PV facility, there is no change to the cumulative impacts associated with the project as a result of the proposed amendments.
- » Finally, there is no need for any reassessment of the ecology at the site or any change in the outcomes of the ecological report for Vryburg Solar 1 site and it recommended that the existing ecological (terrestrial and aquatic) report applies for the Vryburg Solar 1 Part 2 amendment. No additional mitigation is therefore required as a result of the amendments.

Therefore there is no objection to the Part 2 amendment from an ecological perspective.

5.2. Impacts on Avifauna

The Avifauna Specialist Addendum Letter (**Appendix B**) included a review and assessment of the original Avifauna Impact Assessment and data, as well as the update of any previously assessed impacts and additional mitigation measures, where required. The following was concluded:

- » The inclusion of a BESS within the authorised 15ha construction compound/laydown area, and the collector infrastructure within the authorised footprint of the substation, will not change the nature or significance of any of the impacts already assessed in the BA report in any significant manner.
- » The BESS and collector infrastructure are not likely to result in any new impacts that were not previously assessed in the BA report.
- » As the BESS and collector substation components are located within the authorised footprint of the PV facility, there is no change to the cumulative impacts associated with the project as a result of the proposed amendments.
- » No additional management outcomes or mitigation measures over and above those already contained in the BA report in terms of avifaunal impacts would be applicable to the BESS and collector infrastructure.

It is therefore the opinion of the avifaunal specialist that there is no objection to the Part 2 amendment from an avifaunal perspective.

5.3. Soil and Agricultural Potential Impacts

The Soil and Agricultural Specialist Addendum Letter (**Appendix C**) included a review and assessment of the original Agricultural Impact Assessment and data, as well as the update of any previously assessed impacts and additional mitigation measures, where required.

The environmental impact assessment process for Vryburg Solar 1 included a report by Johann Lanz (submitted on 16 July 2018) that describes the soil and agricultural properties of the development area. Considering this report, the area consists mainly of shallow soils of the Coega and Gamoep forms with mainly moderate-low land capability. The agricultural activities of the development area have been described as

grazing without any presence of cultivated land. As a result of the arid climate and shallow soil depth, the only agricultural activities considered to have long-term sustainability, is extensive livestock farming.

The report by Lanz (2018), identified the following impacts as a result of the project infrastructure associated with the Vryburg Solar 1:

- » Loss of agricultural land use
- » Generation of alternative land use income
- » Soil degradation

In addition to the original impacts identified and rated, soil pollution as a result of construction and operation of the BESS, is considered to be a potential risk that will require the implementation of mitigation measures. The significance of any potential soil pollution resulting from the project, is rated in the table below.

Nature: The following construction activities can result in the chemical pollution of the soil: <ol style="list-style-type: none"> 1. Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation. 2. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site. 3. The accidental spills from temporary chemical toilets used by construction workers. 4. The generation of domestic waste by construction workers. 5. Spills from fuel storage tanks during construction. 6. Pollution from concrete mixing. 7. Any construction material remaining within the construction area once construction is completed. 8. Containment breaches related to the battery units and any inadvertent chemical exposure therefrom. 		
During the operation phase of the BESS, maintenance and repairs can result in waste generation within the assessment zone.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Low (4)	Improbable (2)
Significance	Medium (36)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A
Mitigation: <ul style="list-style-type: none"> • Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills. • Any waste generated during construction, must be stored into designated containers and removed from the site by the construction teams. • Any left-over construction materials must be removed from site. • Ensure battery transport and installation by accredited staff / contractors. • Adhere to a procedure for the safe handling of battery cells during transport and installation. 		
Residual Impacts: The residual impact from the construction and operation of the proposed project will be low to negligible.		

5.3.1. Cumulative Assessment

Any additional infrastructure that will be constructed to strengthen and support the operation of the Vryburg Solar 1 and where waste is not removed to designated waste sites, will increase the cumulative impacts associated with soil pollution in the area.

5.3.2. Conclusion

Apart from the inclusion of mitigation measures to prevent soil pollution to ensure the significance of the impact remains low, it is the professional opinion of the soils and agricultural specialist that the findings and recommended mitigation measures of the specialist report (Lanz, 2018) for the development footprint of Vryburg Solar 1, is also applicable to the construction and operation of the BESS as well as the addition of collector infrastructure to the authorised on-site substation.

It is therefore the opinion of the specialist that there is no objection to the Part 2 amendment from a soils and agricultural potential perspective.

5.4. Heritage Impacts (Including Palaeontology)

The Heritage Specialist Addendum Letter (**Appendix D**) included a review and assessment of the original Heritage Impact Assessment (Including Palaeontology) and data, as well as the update of any previously assessed impacts and additional mitigation measures, where required.

The area proposed for the BESS development is located within the construction compound / laydown area marked within the several figures within the Heritage Specialist Addendum Letter (**Appendix D**). This area was thoroughly assessed for impacts to heritage resources in the Heritage Impact Assessment conducted by Van Schalkwyk (2018, SAHRIS NID 510838). The HIA by Van Schalkwyk is referred to below.

Archaeology and Built Environment Heritage

Despite the overall archaeological sensitivity of the broader landscape, the archaeological survey conducted by Van Schalkwyk (2018, SAHRIS NID 510838) identified only three heritage resources of significance in his assessment for the authorised Vryburg PV projects. Two of these include Stone tools identified to occur on a low ridge to the east of the substation (SAHRIS Site ID 130950 and 130951). These artefacts mostly date to the Middle Stone Age, although some smaller ones might date to the Later Stone Age. Cores, tools and flakes (debitage) were identified, indicating that the tools were manufactured on site. The material used was mostly chert, although some quartzite was also identified. The density of the stone tool scatter seems to be quite consistent over the whole ridge, averaging at approximately 2 pieces per 2m². The third site (SAHRIS Site ID 130952) is recorded as six graves occurring west of the substation. They were very old and only marked with low stone cairns. As they were located next to the laydown area for the construction of the substation, they were previously fenced off. According to the SAHRIS comment issued for this case, these human remains were successfully relocated under a permit in terms of section 36 of the NHRA in 2014. None of these resources were located within the area proposed for the BESS development.

Palaeontology

In his palaeontological assessment, Durand (2018) notes that "The study area is covered in natural vegetation with grass and shrubs and trees and is used for cattle farming. The soil cover in the study area is

relatively thin and the underlying eroded bedrock is exposed in places. No distinct or remarkable fossils were found on this field trip. This however does not imply that Tertiary-aged fossils or stromatolites would not be discovered once the grass and soil are cleared and it is highly probable that they will be discovered in the study region as soon as excavations commence. Stromatolites of various kinds and sizes were found on the neighbouring farm Waterloo (Almond, 2013)." As such, although no palaeontological resources were identified within the area proposed for the BESS development during the field assessment undertaken in the BA process, it remains likely that significant palaeontological heritage in the form of Tertiary-aged fossils or stromatolites will be impacted. As such, a Palaeontological Chance Finds Procedure must be implemented for the duration of excavations activities.

5.4.1. Cumulative Impacts

The proposed BESS development and collector substation components will form part of the infrastructure required for the Vryburg solar development and is located in close proximity to the substation and operations and maintenance facilities for this facility. Furthermore, the proposed BESS and collector substation components are located within an already approved solar facility development footprint which is also located within a belt of approved renewable energy facilities. In terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise culturally significant landscape. The construction of the proposed BESS is therefore unlikely to result in unacceptable risk or loss, nor will the proposed BESS development result in a complete change to the sense of place of the area or result in an unacceptable increase in impact. No additional cumulative impacts have been identified in addition to those already identified in the BA.

5.4.2. Conclusion

There is no objection to the proposed development of Vryburg Solar 1 BESS and collection substation components on heritage grounds and no monitoring protocols are recommended. There are no disadvantages or advantages associated with the proposed amendment from a heritage perspective however, it should be noted that, although there were no other archaeological or heritage resources identified during the survey conducted for the already approved solar facility; some archaeological material, including artefacts and graves can be buried underground and as such, may not have been identified during the initial survey and site visits. In the case where the proposed development activities bring these materials to the surface, work must cease and SAHRA must be contacted immediately to determine a way forward. The following findings have been made:

- » No archaeological resources were identified in the project area identified for the development of the BESS.
- » No graves or burial grounds were identified in the project area identified for the development of the BESS. However, graves are subterranean in nature and might not have been identified during the initial site visit and survey.
- » Based on the known palaeontological sensitivity of the area, it remains likely that significant palaeontological heritage in the form of Tertiary-aged fossils or stromatolites will be impacted by the development. As such, the Palaeontological Chance Finds Procedure must be implemented for the duration of excavations activities.
- » If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.

5.5. Impacts on the Social Environment

The Social Specialist Addendum Letter (**Appendix E**) indicated that the proposed amendment for Vryburg Solar 1 would not result in additional impacts from a social perspective and the impacts and mitigation measures included in the SIA would remain unchanged and applicable for the proposed amendment.

Understanding the nature of the proposed amendments and the fact that the addition of the BESS, as well as the addition of collector infrastructure to the authorised on-site substation, does not change the assessed and authorised development footprint, which was fully assessed as part of the SIA, it is concluded that the proposed amendments will not introduce any new social impacts, nor significantly alter the social impacts as previously assessed in the SIA. It is understood that the BESS may result in additional employment opportunities during the construction and operation phases, however these are limited and do not affect the significance ratings of the related impacts. The general purpose and utilisation of a BESS is to save and store excess electrical output as it is generated, allowing for a timed release when the capacity is required. BESS systems therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand. This is seen as a benefit from a social perspective but does not change the significance of the positive impact related to the project as previously assessed.

Considering that there will be no change in impacts, no additional mitigation or enhancement measures are required for the addition of the BESS, as well as the addition of collector infrastructure to the authorised on-site substation, to the layout from a social perspective. The recommendations, mitigation and enhancement measures provided in the SIA are considered sufficient for the enhancement of the positive impacts and the management and mitigation of the negative impacts to acceptable levels. Therefore, all enhancement and mitigation measures, as proposed in the SIA are still required to be implemented for the amended Vryburg Solar 1 development.

5.5.1. Cumulative Impacts

No additional social cumulative impacts were identified by the specialist as a result of the proposed amendments. Therefore, the cumulative impacts identified by the Social Impact Assessment report remain unchanged and would be applicable to the proposed amendment.

5.5.2. Conclusion

Based on the nature of the proposed amendments for Vryburg Solar 1, and the fact that the proposed BESS and substation collector infrastructure falls within the properties and development footprint which was fully assessed as part of the SIA (2018), it can be concluded that the amendment will not lead to any additional impacts other than those identified and assessed within the SIA (undertaken in 2018). No change in the significance of the impacts is expected to occur and there is no need for any additional recommendations or mitigation measures other than those already specified in the SIA (2018).

The proposed amendments are considered acceptable from a social perspective and can be approved, subject to the implementation of the mitigation and enhancement measures as specified in the SIA (2018).

5.6. Visual Impacts

The Visual Specialist Addendum Letter (**Appendix F**) serves as an addendum to the original Visual Impact Assessment (VIA) report for the Proposed 115MW Solar Photovoltaic Facility (Vryburg Solar 1) and associated infrastructure.

The addition of the BESS is not expected to significantly alter the area of potential visual exposure and is therefore not expected to significantly alter the influence of the Solar Energy Facility (SEF) on areas of higher viewer incidence (observers traveling along the national, arterial/main, or major secondary roads within the region) or potential sensitive visual receptors (residents of homesteads in close proximity to the SEF).

In consideration of the proposed addition of the BESS, and the change in the description included in the EA pertaining to the on-site substation, there is no (zero) change to the significance rating compared with the original Basic Assessment (BA) VIA report and no additional visual impacts are envisaged. In addition to this, no new mitigation measures are required.

The proposed amendments are expected to have a neutral effect from a visual impact perspective i.e. no advantages or disadvantages are expected.

It is therefore recommended that the proposed amendments allowing for the addition of the BESS, and the change in the description included in the EA pertaining to the on-site substation be supported, subject to the conditions and recommendations as stipulated in the original Environmental Authorisation, and according to the Environmental Management Programme and suggested mitigation measures, as provided in the original VIA report.

5.7. Assumption and Limitations

It is assumed that all the information provided by the Applicant, Organs of State and Key Stakeholders is accurate and valid for the project. The authorised development footprint of Vryburg Solar 1 was assessed in its entirety during the undertaking of the BA and therefore there are no uncertainties with the regards to the assessment of the proposed amendment for the construction and operation of the BESS, and the change in the description included in the EA pertaining to the on-site substation within the authorised development footprint of the solar energy facility.

6. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT

In terms of Regulation 32(1)(a)(ii), this section provides details of the advantages and disadvantages of the proposed amendment.

Advantages of the amendment	Disadvantages of the amendment
General	
The construction and operation of the BESS will allow for extended generation hours for the solar PV facility, as stored energy from the solar PV facility can be released into the grid during hours when the solar PV facility would not usually be operational. This will negate the need to construct additional power facilities to provide 115MW of electricity to the grid when the solar energy facility will not be operating.	None.
The change in the description of the on-site substation will allow for the generated electricity of other projects to be collected at the on-site substation, enabling the electricity to be transported by a single overhead power line (instead of multiple overhead power lines) to the grid connection point which is the Mookodi substation.	None.
Ecology (flora, fauna and avifauna), Freshwater, Soils and Visual	
The construction and operation of the BESS will allow for extended generation hours for the solar PV facility, as stored energy from the solar PV facility can be released into the grid during hours when the solar PV facility would not usually be operational. This will negate the need to construct additional power facilities to provide 115MW of electricity to the grid when the solar PV facility will be operating.	None.
Therefore, the utilisation of the BESS within the authorised footprint of the solar energy facility reduces environmental impacts from an ecological, freshwater, soils and agricultural potential, heritage and visual perspective.	
The amendment of the on-site substation description will allow for only one overhead power line to be developed within the area for multiple projects (where successful). This amendment will provide an opportunity for a reduced need to develop individual overhead power lines in the area for each successful project, which will in turn reduce the environmental impact associated with the development of power line infrastructure	None
Social	
The construction and operation of the BESS will allow for extended generation hours for the solar PV facility, as stored energy from the solar PV facility can be released into the grid during hours when the solar PV facility would not usually be operational. This is seen as a benefit from a social perspective.	None

Based on the above, it can be concluded that the advantages of the proposed amendment outweigh the disadvantages from an environmental and technical perspective.

7. RISKS ASSOCIATED WITH THE PROPOSED AMENDMENTS

Possible risks associated with the construction and operation of the BESS from a technical perspective within the authorised development footprint of Vryburg Solar 1 are limited to health and safety aspects during the project life cycle of the BESS as well as the solar energy facility. The risks identified for the construction and operation of the BESS are detailed below. Mitigation measures have been included within the project EMPr (**Appendix K**).

<i>Nature of Risk</i>	<i>Likelihood</i>	<i>Impact</i>	<i>Mitigation / Management of Risk</i>
1. <u>Mechanical breakdown / Exposure to high temperatures</u> » Incidents where the batteries are broken or exposed to temperatures above room temperature could lead to overheating as well as fires which can affect infrastructure components of the BESS. » Leakages of substances contained within the battery cells (should they not be assembled off-site).	Low	» Fires, electrocutions and spillage of toxic substances into the surrounding environment. » Spillage of hazardous substances into the surrounding environment. » Soil contamination – leachate from spillages which could lead to an impact of the productivity of soil forms in affected areas. » Water Pollution – spillages into surrounding watercourses as well as groundwater. » Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water.	» Operators are trained and competent to operate the BESS. Training can include the undertaking of an appropriate fire fighting course for the operators prior to the commencement of the operation phase of the BESS. From each team, a fire marshal should be selected to manage the risk should there be a fire within the BESS. » Undertake daily risk assessment prior to the commencement of daily tasks at the BESS. This should consider any aspects which could result in fire or spillage, and appropriate actions should be taken to prevent these. » Standard Operating Procedures (SOPs) should be made available by the Supplier to ensure that the batteries are handled in accordance with required best practices. » Spill kits must be made available to address any incidents associated with the flow of chemicals from the batteries into the surrounding environment. » The assembly of the batteries on-site should be avoided as far as possible. Activities on-site for the BESS should only be limited to the placement of the container wherein the batteries are placed. » Undertake periodic inspections on the BESS to ensure issues are identified timeously and addressed with the supplier where relevant. » The applicant in consultation with the supplier must compile and implement a Leak and Detection Monitoring Programme during the project life cycle of the BESS. » Batteries must be strictly maintained by the supplier or suitably qualified persons for the duration of the project life cycle. No unauthorised personnel should be allowed to maintain the BESS.

Nature of Risk	Likelihood	Impact	Mitigation / Management of Risk
2. <u>Generation of hazardous waste</u> » The incorrect disposal of the batteries and the associated components could have an adverse impact on the environment.	Medium	» Spillage of hazardous substances into the surrounding environment. » Soil contamination – leachate from the disposed batteries into the soil, which could lead to an impact of the productivity of soil forms in affected areas. » Water Pollution – leachate from the disposed batteries spilling into surrounding watercourses as well as groundwater. » Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water.	» Damaged and used batteries must be removed from site by the supplier or any other suitably qualified professional for recycling or appropriate disposal. » The applicant should obtain a cradle to grave battery management plan from the supplier during the planning and design phase of the system. The plan must be kept on site and adhered to. »

Based on the above it can be concluded that the construction and operation of the BESS within the authorised development footprint of Vryburg Solar 1 will result in negligible risks from an environmental perspective and can be appropriately managed.

8. REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENTS

As required in terms of Regulation 32(1)(a)(iii), consideration was given to the requirement for additional measures to ensure avoidance, management and mitigation of impacts associated with the proposed change. From the specialist inputs provided into this Final Motivation Report, it is concluded that the impacts identified as a result of the proposed amendments are acceptable from an environmental perspective.

In general, the recommended mitigation measures included in the BA Report as well as the EMPr (refer to **Appendix K** of the Final Motivation Report) would manage the anticipated impacts to acceptable levels. Additional mitigation measures are recommended from a soils perspective to prevent soil pollution to ensure the significance of the impact remains low. The EMPr of the solar energy facility has been updated to include these measures as well as management measures for the operation of the BESS from a technical perspective.

9. PUBLIC PARTICIPATION

A public participation process was conducted in support of the Amendment Application to amend the Environmental Authorisation (DEA Ref: 14/12/16/3/3/1/1939) issued for Vryburg Solar 1. The Public Participation was undertaken in accordance with the Public Participation Plan which has been submitted to the Department of Environment, Forestry and Fisheries (DEFF) and subsequently approved, which is in-line with Regulations 41- 44 of the EIA Regulations, 2014, and includes:

- » Placement of site notices at the site on **16 October 2020** (refer to **Appendix G4**). Proof of placement is included in **Appendix G4** of this Final Motivation Report.
- » The Motivation Report was made available for the 30-day review and comment period from **Friday, 30 October 2020** to **Monday, 30 November 2020** on the Savannah Environmental website: <https://www.savannahsa.com/public-documents/energy-generation/vryburg-solar-1-2-3-facilities/>. CD copies were made available on request.
- » Written notifications to registered I&APs as well as Organs of State regarding the availability of the Motivation Report were distributed on **29 October 2020** (refer to **Appendix G2** and **Appendix G3**).
- » Placement of an advertisement in the Stellander Newspaper on **Wednesday, 28 October 2020** announcing the availability of the Motivation Report for a 30-day review and comment period. The tear sheet of the newspaper advert is included in **Appendix G4**.

Comments received during the 30-day review and comment period is included as **Appendix G5** of this Final Motivation Report. Comments have been included and responded to in the Comments and Responses Report (included as **Appendix G6**). Proof of attempts made to obtain comments from relevant Organs of State and key stakeholders is included in **Appendix G3**.

10. CONCLUSION

Based on the nature of the proposed amendments for Vryburg Solar 1, the specialist findings, the fact that the proposed BESS development area and substation area avoid areas of high environmental sensitivity (refer to **Figure 10.1**), and that the proposed BESS and the change in the description included in the EA pertaining to the on-site substation falls within the property and development footprint which was fully assessed and authorised for the development of the solar PV facility as part of the BA Report in 2018, it can be concluded that the proposed amendments will not lead to any additional impacts other than those identified and assessed within the BA Report, apart from the potential for soil pollution associated with the BESS.

In terms of the impacts identified in the BA relating to ecology, avifauna, soil and agricultural potential, heritage (including palaeontology), visual and social aspects, it was concluded that the proposed amendments will not increase the significance of those impacts originally identified and assessed in the BA Report or lead to any additional impacts that cannot be mitigated to a low significance following the implementation of the recommended mitigation measures. Furthermore, the proposed amendments do not constitute a listed activity and the mitigation measures recommended in the BA Report and in this Final Motivation Report are adequate to manage the expected impacts as a result of the proposed amendment. Additional mitigation measures have been identified by the soils specialist which has been included in the EMPr (**Appendix K** of the Final Motivation Report, which was made available during the 30-day review and comment period.

Therefore, taking into consideration the conclusions from the specialist addendum letters (**Appendix A – F**), and the findings of this report, it is concluded that the proposed amendments are acceptable from an environmental perspective, subject to the implementation of the recommended mitigation measures included in the BA Report as well as the Environmental Management Programme (EMPr) (**Appendix K**) for Vryburg Solar 1.

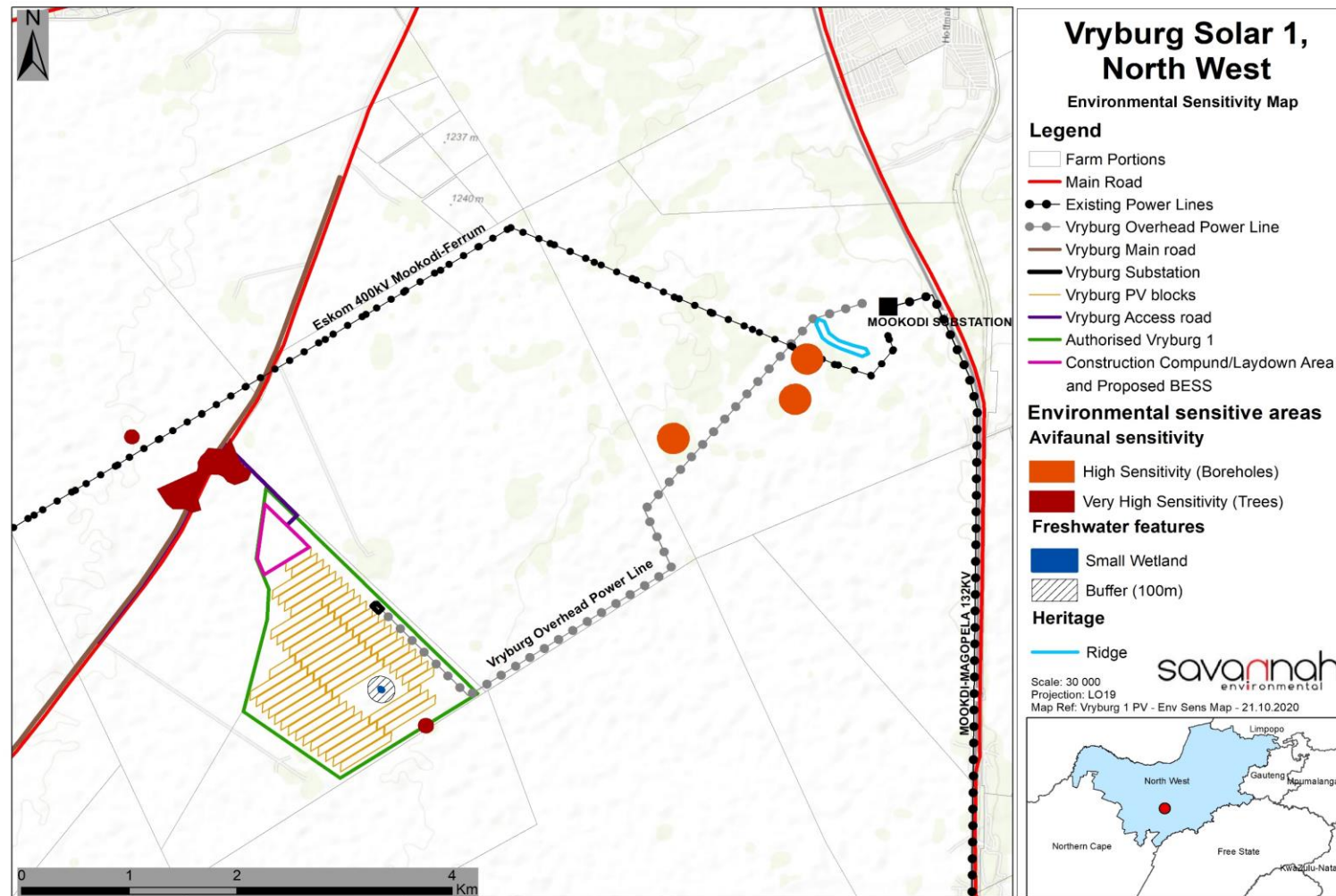


Figure 10.1 Environmental sensitivity map showing the location of the BESS development area and substation area located outside of areas of high environmental sensitivity. A3 Maps are included in **Appendix H** of the Final Motivation Report.

