Vaal River Solar 3 PV Facility near Orkney in the North West Province

Site Verification and Motivation for Amendment of the Environmental Authorisation

DEA Ref.: 12/12/20/2513/3

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PROJECT DETAILS

Title	:	Vaal River Solar 3 PV Facility near Orkney in the North West Province Site Verification and Motivation for Amendment of the Environmental Authorisation
DFFE Reference number	:	12/12/20/2513/3
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Client	:	Vaal River Solar 3 (Pty) Ltd
Report Status	:	Final Report

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TABLE OF CONTENTS

LIST OF APPENDICES

PURPOSE OF THE REPORT

Vaal River Solar 3 (Pty) Ltd proposes to make amendments to an existing Environmental Authorisation (EA) for the Vaal River Solar 3 PV Facility Project in the North West Province (DFFE Ref: 12/12/20/2513/3 issued on the 10 October 2012. The amendments being applied for relate to various aspects of the project description as detailed in the EA dated 10 October 2012. The requested amendments include:

- An increase of total generation capacity of the facility from 100MW to 250MW, with no adjustment in the PV panel height or development footprint,
- Inclusion of a Battery Energy Storage System (BESS) into the project description of the EA, and
- An extension of the commencement period (validity) of the Environmental Authorisation.

Additional information has been requested (in terms of Regulation 30(1)(a) of the EIA Regulations, 2014 as amended) for the Department to be able to process the application for amendment. Savannah Environmental, as independent consultant, has prepared this Site Verification and Motivation Report in support of the application for the proposed amendments on behalf of Vaal River Solar 3 (Pty) Ltd.

This report provides detail pertaining to the environmental impacts as a result of the requested amendments in order for stakeholders and interested and affected parties to be informed and submit comments, and for the competent authority to be able to reach a decision in this regard. This report is supported by specialist site verification and motivation reports to inform the conclusion and recommendations regarding the proposed amendments (refer to **Appendix A to E** of this report). This Site Verification and Motivation Report must be read together with these specialist reports (as well as the original specialist assessments conducted during the EIA process) to obtain a complete understanding of the proposed amendments and the implications thereof from an environmental perspective.

The Draft Site Verification and Motivation Report was made available for a 30-day review and comment period in accordance with Regulation 43(2) of the EIA Regulations, 2014 (as amended) from **05 July 2022** to **03 August 2022**. All comments received during the 30-day review and comment period are included within a Comments and Responses Report (C&RR) attached as **Appendix F5.**

1. OVERVIEW OF THE PROJECT

1.1. Location

The Vaal River Solar 3 PV Project, a solar PV project of up to 100MW (as amended) in capacity, was authorised by the DFFE on 10 October 2012 (DFFE Ref: 12/12/20/2513/3). The authorised Vaal River Solar 3 PV Project development footprint is located approximately 8km northeast of Orkney within the City of Matlosana Local Municipality in the North West Province. The project site is located within the Klerksdorp Renewable Energy Development Zone (REDZ), which was specifically designated as a REDZ in February 2021 (GNR144) for the deployment of PV in areas previously used extensively by the mining sector and to assist in South Africa's Just Energy Transition. The area was considered favourable for the development of solar facilities by DFFE through their SEA process of defining the REDZ areas. The site is bordered to the south by the R502 from Orkney, with the Eskom Hermes Transmission Substation located approximately 6 km east of the site (refer to **Figure 1.1**).

The development footprint of the solar PV facility is located on Portion 200 of Farm Nooitgedacht.
The following infrastructure components were authorised by the DFFE:

- Photovoltaic solar panels;
- Foundations to support the PV panels;
- Cabling between the project components, to be laid underground where practical;
- Internal access roads; and
- Workshop area for operations, maintenance and storage

1.2. Status (baseline) of the Environment assessed through the EIA Process (EIA report, 2012)

The findings of the specialist studies undertaken within the EIA undertaken in 2012 to assess both the benefits and potential negative impacts anticipated as a result of the proposed Vaal River Solar 3 Facility, conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding. The table below summarise the baseline status of the environment that was assessed through the EIA process in 2012 for the proposed Vaal River Solar 3 project.

Topography	The topography of the study site is relatively flat. There is a slight drop in elevation towards the Vaal River and from east to west. The elevation on site varies from 1330m to 1344m above sea level over a distance of 1.5 km, which is a very gentle slope.
Climate	The climate of the area is typical of the Highveld. Rainfall occurs from November to April. Mean annual rainfall is 520 mm per year. The study area can therefore be considered to be an intermediate, summer rainfall area.
Land use type	The land is owned by a Mining Company and land use was associated with the mining activities. The site is located within a mining belt with numerous mines located nearby. The major land-uses in the area were a mixture of mining activities and agricultural, predominantly cattle grazing. The land use of the area is termed as possible grazing. However no grazing was permitted due to safety reasons and the on-going land use (as related to mining).
Vegetation	According to Hoare (2012), no high/very high sensitive and "No-Go" areas were identified on the project site. The study site falls entirely within the Vaal Reefs Dolomite Sinkhole Woodland vegetation type. The vegetation type is classified as Least Threatened (Mucina & Rutherford 2006)

	and is furthermore not listed within the list of threatened terrestrial ecosystems for South Africa (as published on 9 December 2011 (G 34809, GoN 1002)). According to Mucina & Rutherford (2006) approximately 23% of the vegetation type has been transformed. At a national level the project area, at the time of the initial study, the project site was not located within any conservation planning/priority areas (e.g. NPAES Focus Areas, NPAES Formal Protected Areas, NPAES Informal Protected Areas, NEM:BA's Threatened Terrestrial Ecosystems for South Africa). From a provincial level, the site does not impact any Critical Biodiversity Areas for the North-West Province, The vegetation is a grassland-woodland complex of which the woodland is the most typical feature. The ecological specialist found that one plant species that is protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) could potentially occur in the region, *Harpagophytum procumbens* (Devil's Claw). No Plant SCC were recorded during the site survey (Hoare, 2012). No protected trees (protected under the National Forest Act) were identified on site.
Fauna and Avifauna	No mammal species were confirmed within the project site during the survey. Four mammal species of conservation concern could occur in available habitats in the study area but were not located. No avifauna species were confirmed within the project site during the survey. The following three threatened bird species (Blue Crane, Lesser Kestrel, White-bellied Korhaan, all VU) and two Near Threatened bird species (Lanner Falcon, Melodious Lark) have a medium to high probability of utilising available habitats in the study area, either for foraging or breeding. No amphibian species were confirmed within the project site during the survey. The Giant Bullfrog is the only amphibian species of conservation concern with a distribution that includes the study area, and which could occur on site. No reptile species were confirmed within the project site during the survey. There is one reptile species of conservation concern that has a distribution that includes the study area, the Striped Harlequin Snake, listed as Near Threatened.
Soils and Agricultural Potential	The agricultural potential of the site was rated as having a predominately low significance The study site falls into the Fa13 land type, the Fa land types denote areas where shallow soils dominate and where lime is not encountered regularly. The agricultural potential of the site is low due to the dominance of shallow and rocky soils. The erosion potential of the site is low due to the inherent well-drained nature of the soils (even the rocky and shallow soils) and impacts due to erosion are not expected.
Wetlands	No freshwater features are present on the site. During the initial EIA, it was indicated that the topographic wetness index (TWI) map for the site indicated areas of preferential surface flow of water, however there are no signs of wetland soil conditions that could be found on site. The reasons are that the soils are well-drained, and that ponding does not occur naturally for long periods, as well as the presence of high levels of Manganese (Mn) in the soils.
Heritage	No sites of heritage significance were identified on the site in the EIA process undertaken in 2012 and no sites of palaeontological significance were identified on the site.
Social Characteristics	The study site is located within a mining area and the local economy is dominated by the mining industry. The City of Motlasana forms the economic heart of North West Province. It is still one of the hubs of the South African gold mining industry, although the declining mining economy in the area has caused an increase in the unemployment levels.
Other planned Projects in the area (during EIA Phase)	The EIA process in 2012 looked at already existing infrastructure within the vicinity of the proposed development and the following were considered: » Hermes Substation associated power lines » Slimes dams » mine shafts

1.3. Potential Environmental Impacts as determined through the EIA Process

From the specialist investigations undertaken within the Environmental Impact Assessment (EIA) process for the solar PV facility (Savannah Environmental, 2012), the following environmental impacts relevant to the amendment application were identified:

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

The key conclusions and recommendations of the original EIA pertinent to this application, as reported in the final EIR (Savannah Environmental, 2012) are summarised as follows.

1.3.1. Summary of environmental findings in the EIA Report (2012)

The EIA found that based on the nature and extent of the project, the local level of disturbance predicted as a result of the construction and operation of the PV facility and associated infrastructure, the understanding of the significance level of potential environmental impacts that the impacts associated with the development could be managed and mitigated to an acceptable level, and that no fatal flaws were found.

1.3.2. Impacts on Ecology

The Vaal Reefs Dolomite Sinkhole Woodland vegetation type is found in the project site. This vegetation type is only found north of the Vaal River in a small area linked with dolomite sinkholes in and around Stilfontein and Orkney. This vegetation type is listed as Vulnerable (Driver et al. 2005; Mucina et al., 2006). The vegetation type is also not included in the Draft National List of Threatened Ecosystems (GN1477 of 2009).

Some parts of the study area were found to be in a natural condition, but others had been transformed by earlier activity in those areas. Those portions of the site that had been severely degraded were classed as having low sensitivity and conservation value. The project site's red list plant species included five species, one of which was Near Threatened and four of which were Declining. Species classified as threatened (critically endangered, endangered, or vulnerable) or near threatened have substantially lower conservation importance than those classed as decreasing or rare.

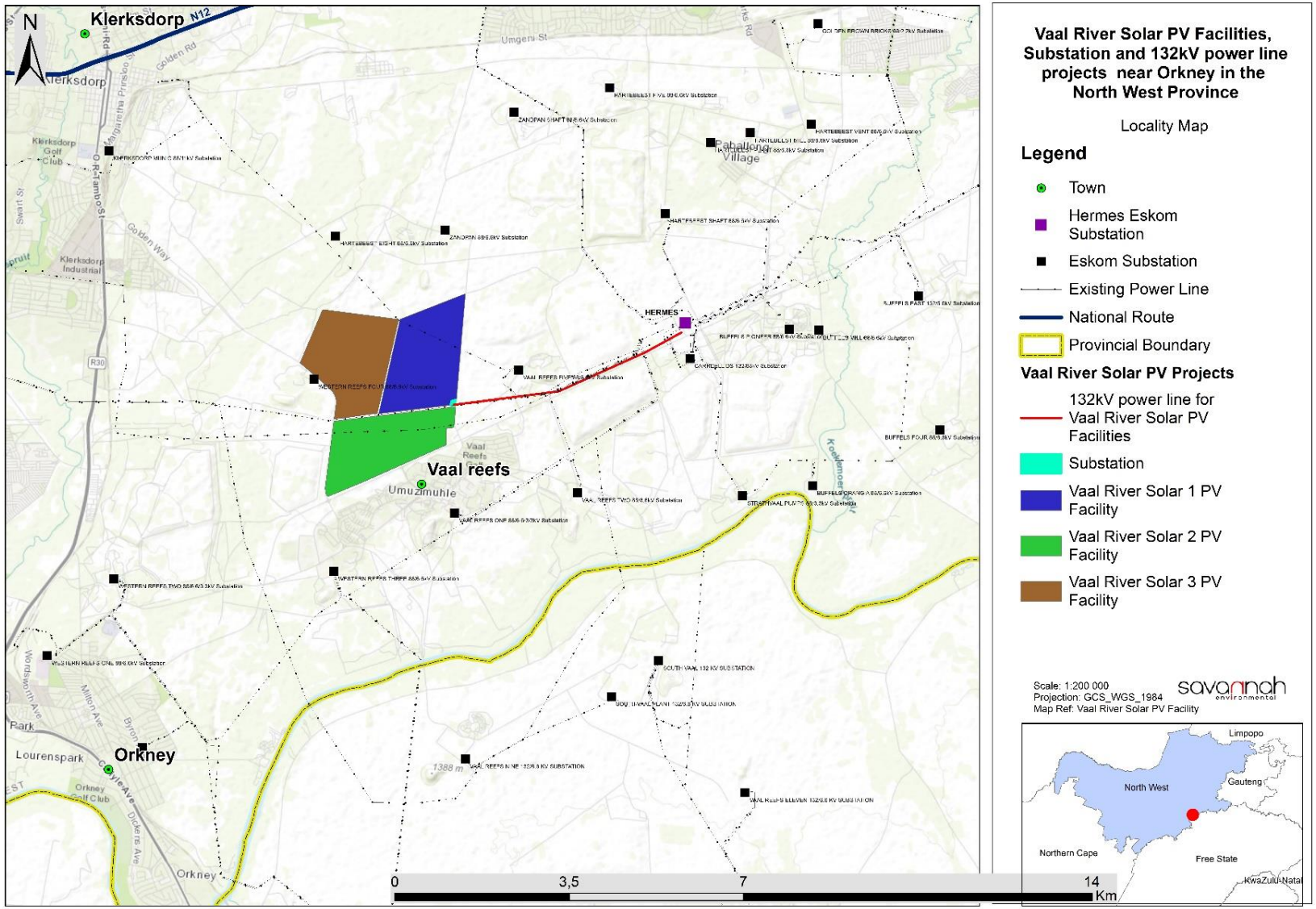

Figure 1.1: Locality map showing the authorised development footprint of the Vaal River Solar 3 PV Facility.

According to the specialist investigation, the construction of the Vaal River Solar 3 PV Facility would result in permanent disturbance of an area of approximately 270ha. The area for the PV panels and associated infrastructure, as well as the internal power line routes and internal access roads, are all permanently impacted locations. There were no 'no go' zones or areas of high sensitivity identified, only areas of medium sensitivity.

Potential impacts and the relative significance of the impacts are summarised below:

Impact	Significance rating (2012)
Loss or fragmentation of indigenous natural vegetation (terrestrial)	medium significance
Loss of individuals of plant species of conservation concern	medium significance
Impacts on threatened animals	low significance
Loss of habitat for threatened animals	low significance
Bird collisions with powerlines	low significance
Establishment and spread of declared weeds and alien invader plants	low significance

The ecological impacts were considered to be of low to medium significance. The following mitigation measures were provided in order to minimise any impacts during development on potentially sensitive areas on the site:

» The construction impacts to be confined to the footprint of the infrastructure.
» Impacts on natural habitats outside the footprint of the proposed infrastructure to be avoided.

1.3.3. Soil and Agricultural Potential Impacts

The impact on agricultural potential was considered to be of low significance based on the specialist findings. Due to the dominance of shallow and rocky soils, the site's agricultural potential is low. Because the site is underlain by dolomite, it does have grazing potential. However, because there is a lot of traffic (vehicle and pedestrian) surrounding and through the site, the land use was not in practise owing to a lack of fencing and livestock theft. Although the inherent qualities of the soils make them suited for irrigation, the underlying geology poses a risk of sinkhole formation if the landscape's water regime is changed.

Potential impacts and the relative significance of the impacts are summarised below:

Impact	Significance rating (2012)
Disturbance of soils and impacts on existing land use due to construction of buildings and associated infrastructure	Medium significance
Disturbance of soils and impacts on existing land use due to construction of roads	medium significance
Physical and chemical degradation (hydrocarbon spills) of the soil by construction vehicles	low significance
Impact of dust generation on site	low significance
Loss of agricultural potential and land capability owing to the construction of the PV panels, access roads, buildings and other infrastructure	low significance

The impacts on soils and agricultural potential were considered to be of low to medium significance. The following mitigation measures were provided in order to minimise any impacts during development on potentially sensitive areas on the site:

» Limit footprint to the immediate development area. Rehabilitation possible after removal of infrastructure due to the low agricultural potential baseline of the development area.
» Limit footprint to the immediate development area and keep to existing roads as far as possible.
» Maintain vehicles, prevent and address spillages.
» Limit vehicle movement to absolute minimum, construct appropriate roads for access.

1.3.4. Heritage Impacts

During the survey, no resources or sites of archaeological, historical or palaeontological value were identified. It was noted that during construction, activities may have an impact on the surface and/or subsurface, which may unearth archaeological and palaeontological resources. Mitigation would be required to ensure minimal impact as a result of damage, change, destruction or removal of such resources from their original locations.

Potential impacts and the relative significance of the impacts are summarised below:

Impact	**Significance rating (2012)**
Impacts on heritage resources (including the archaeological and palaeontological)	low significance

The impacts on heritage and palaeontological resources were considered to be of low significance. The following mitigation measures were provided in order to minimise any impacts during development on potentially sensitive areas on the site:

» Although no sites were recorded during the field survey, it was noted that if any archaeological or palaeontological material is uncovered during construction or operation a qualified archaeologist must be contacted to assess the remains. Mitigation measures can then be activated which will include a permit from SAHRA and documentation and sampling.

1.3.5. Visual Impacts

The potential visibility of the Vaal River Solar 3 PV Facility development area extend primarily south, west and north with intermittent visual exposure due to the topography and the occurrence of mine-related structures. Vaal Reef Gold Mine village and sections of the R502 road would experience high levels of exposure, due to the proximity of facility structures in the southern parts of the development area. Moderate to high exposure is expected in these areas.

Visual exposure to the west affects the area south of Jouberton and the eastern fringes of Orkney. Visual exposure south of the Vaal River affects mostly farmsteads and roads, such as the R30 and R76 main roads. The anticipated impacts were not considered a fatal flaw from a visual perspective.

Potential impacts and the relative significance of the impacts are summarised below:

Impact	Significance rating (2012)
Potential visual impact on observers travelling along arterial and secondary roads in close proximity to the proposed solar energy facility.	medium significance
Potential visual impact on visual impact on towns and residential areas affected by visual exposure.	medium significance
Potential visual impact on holiday resorts and other tourist facilities or places of leisure along the Vaal River	low significance
Potential visual impact of lighting at night on observers in close proximity to the proposed Solar Energy Facility	medium significance
Potential visual impact of the facility on the visual character of the landscape and sense of place of the region.	low significance

The overall visual impacts were considered to be of low significance and are not considered being fatal flaw. The following mitigation measures were provided in order to minimise any impacts during development on potentially sensitive areas on the site:

- Create a buffer around solar arrays.
- Consult an ecologist with regard to appropriate species and placement of additional vegetation cover to soften the visual effect of facility infrastructure.
- Retain a buffer around solar arrays.
- Consult an ecologist with regard to appropriate species and placement of additional vegetation cover to soften the visual effect of facility infrastructure.
- Limiting mounting heights of lighting fixtures.
- Making use of downward directional lighting.
- Making use of minimum lumen or wattage in fixtures.
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors. This will allow the site to remain in relative darkness, until lighting is required for security or operational purposes.

1.3.6. Impacts on the Social Environment

The development will create employment and business opportunities for locals during both the construction and operational phase of the project. Potential impacts associated with the construction and operational phase were assessed to be of medium significance and can be reduced to low significance with mitigation.

Potential impacts and the relative significance of the impacts are summarised below:

Impact	Significance rating (2012)
Influx of jobseekers	medium significance
Employment opportunities and employment equity	medium significance
Skills development and capacity building during the construction phase, especially for the semi and higher skilled positions	medium significance
Impacts on the local economy	medium significance
Changes in the focus of the local and regional economies (from the primary sector to the secondary sector)	medium significance
Disruption in daily living and movement patterns	medium significance

Potential health risks for workers and surrounding communities due to poor management of the construction process	low significance

The social impacts were considered to be of low significance. The following mitigation measures were provided in order to minimise any impacts during development on potentially sensitive areas on the site:

- Stipulate the employment of local labour and enterprises in the tender documents to ensure the maximum use of a local labour force, especially with regards to lower and semi-skilled positions. Locals are, in this instance, defined as the nearest communities or people that reside within a 50 km radius from the project.
- The developer, contractor, and Community Liaison Officer (CLO) should formulate and implement a recruitment strategy to ensure that a suitable labour force is sourced. Tap into the LM's HR Department's skills database and do a skills audit.
- The number and extent of the employment opportunities must be communicated to the local community to avoid those unrealistic expectations be created.
- Prior to construction commencing representatives of the local community, SAPS, the neighbouring residents, and landowners should be informed of details of the construction company, the construction schedule and size of the workforce.
- Due to safety and security risks, recruitment of temporary workers at the access to the construction site should not be allowed. The CLO should work in consultation with the Ward Councillors and community representatives to establish labour desks at the most suitable localities within the local communities where workers are sourced.
- The area where workers are recruited should not be near schools or other sensitive receptors where a large influx of people could cause safety and security impacts for the residents and other sensitive receptors. Provide sufficient sanitation and refuse facilities.
  - Work in collaboration with the LM's HR Department to do a skills audit of the available workforce and minimise the workers to be brought in from other areas.
  - The recruitment strategy should clearly reflect the percentage of workers to be sourced from the local labour force.
  - Enhance on a capacity building and skills development strategy to lessen any possible skills disparity between the local skills available and the requirements of the project.
  - A policy regarding employment equity of minority groups (women, youth and the disabled) should be formulated and implemented wherever possible
  - Do a skills audit of the local workforce to determine what skills are available locally, and to reduce the number of workers and specialists that are brought in from other areas. The recruitment process and strategy should include local businesses, enterprises and SMME's to allow them to become part of the tender process.
  - Co-ordinate with the LM and use the existing skills data base of the HR Department as a point of departure.
  - It is required from the developer to formulate a local procurement strategy to increase the local content of the project to the maximum
  - Formulation of a procurement strategy that maximises local content.
  - Government should identify upcoming and potential SMME's and strategically plan their involvement in the renewable energy sector.
  - The verification of appropriate access roads to the sites has to take good visibility for motorists into consideration.
  - Put up clear signboards along the access roads indicating the accesses to the construction site.

- Impose penalties for reckless drivers as a way to enforce compliance to traffic rules.
- Limit heavy vehicle movement through residential areas (Orkney and Vaal Reefs), especially avoiding peak times.
- Inspect trucks and other heavy vehicles on a regular basis to avoid oil spillages and unroadworthy vehicles that could lead to accidents.
- Display a contact number on the construction vehicles where motorists can report bad driving.
- No heavy vehicles to be parked outside the designated construction area where it could obstruct motorists' views.
- No informal traders to be allowed on or near the construction site.
- Set up the labour desk in a secure and suitable area, preferably in the communities where workers are being sourced, to discourage the gathering of temporary workers at the gates of the construction site where it could affect road users.
- The contractor should recognize his responsibility towards social / soft issues and should embark on an HIV/AIDS awareness campaign amongst the workers. A strategy to appoint a local labour force as far as possible will limit the spread of diseases.
- Appoint a Health and Safety Officer and comply with the Occupational Health and Safety Management System's requirements. The contact details of this person should be made available to the local community and procedures to lodge complaints set out.
- Provide adequate drinking water and appropriate sanitation facilities to the workers. Sanitation facilities to be cleaned and serviced on a regular basis.
- Dispose of rubble and other household waste appropriately and on a regular basis.
- Identify the waste types that are likely to be produced and aim to reduce the amount of waste as much as possible, through identifying routes to reuse or recycle materials. Label all waste storage and skips, detailing the type of waste.
- Store any materials away from sensitive locations in fenced off areas.
- Spray gravel / sand surfaces regularly with water to suppress dust.
- Avoid the establishment of a construction camp to house workers on the site.
- Security guards should be the only people allowed to stay overnight on the site. Their accommodation and facilities should comply with health and safety standards.
- Regularly inspect the site area for spillages and clean spillages using agreed wet handling methods.
- Inform the LM and emergency services if harmful substances are spilled.
- Nightlights (security lights) should be directed away from residences and the surrounding roads to limit nuisances and safety hazards for motorists.
- An increase in employment opportunities with economic advantages for the local economy and workforce
- New local service providers that emerge with the increase of opportunities.
- Increasing competition amongst service providers, resulting in a more favourable pricing structure for services.
- Skills development and capacity building of the local workforce.
- It would increasingly become more difficult to fill higher and semi-skilled positions with locals if other renewable energy projects in the area are also implemented
- Source locals for employment positions as far as possible, to enhance the advantages of skills development and training for the LM area.
- Implement measures (bonuses or other financial benefits) for highly skilled staff to minimize the negative impacts associated with a high staff turnover.
- Apply all the mitigation measures as proposed by the Visual Impact Assessment.
- Ensure that residents in Vaal Reefs are aware of the procedures to lodge complaints.

- Implement all safety and security measures, as proposed by the developer, to combat potential crime.
- Extend the benefits of the project to the local community by employing local people as far as possible, allocating a percentage of the turnover of the project for community and socio-economic upliftment projects and allocate shares in the project to a community Trust or similar entity.
- Implement all the proposed security measures, such as 24-hour security and access control, electric fencing, CCTV cameras and night lights where possible.
- Maintain good relationships with neighbours, discuss security issues and measures and make the contact details of the Operations Manager available should complaints be lodged

2. DESCRIPTION OF REQUESTED AMENDMENTS

This section of the Site Verification and Motivation Report details the amendments considered within this report and by the specialist site verifications investigations (refer to **Appendix A – E**). The amendments being applied for relate to various aspects of the project description as detailed in the EA dated 10 October 2012. The requested amendments will result in an increase of total generation capacity of the facility, an update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS), and the extension of the validity period of the Environmental Authorisation. Each amendment request is detailed below. Motivation for the amendments is included in Section 3 of this report.

2.1. Amendment 1: An increase of total generation capacity of the facility

he original EA dated 10 October 2012 (12/12/20/2513/3) read in conjunction with Amendment 4 issued on the 16 December 2018 (12/12/20/2513/3/AM4), which authorised a generation capacity of 100MW. The Applicant is proposing to amend the authorised capacity from 100MW to 250MW. PV panel heights and the development footprint of the facility will remain the same as those authorised.

The following changes in the EA project description are therefore requested. Changes requested are highlighted in **bold text** for ease of reference.

EA Reference	Current wording	Proposed amendment
Title of the Project- EA Cover Letter	*"Environmental Authorisation in terms of the National Environmental Management Act, GN R55 And R545: proposed construction of a 100MW photovoltaic facility on Portion 200 of Farm Nooitgedacht, Orkney, North West Province"*	"Environmental Authorisation in terms of the National Environmental Management Act, GN R55 and R545: proposed construction of a **250MW** photovoltaic facility on Portion 200 of Farm Nooitgedacht, , Orkney, North West Province"
Page 1	*"Proposed Construction of Vaal River Solar 3 - a 100MW photovoltaic facility on Portion 200 of Farm Nooitgedacht, Orkney, Northwest Province"*	"Proposed Construction of Vaal River Solar 3- a **250MW** photovoltaic facility on Portion 200 of Farm Nooitgedacht,Orkney, Northwest Province"
Page 3	*GN R544 Item 11 (ii)(xi):* *Construction of infrastructure or structures covering 50 square meters or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse. Excluding where such construction will occur behind the development setback line* Proposed generation of electricity with an output of 100MW. It is proposed to construct 132kV power line	GN R544 Item 11 (ii)(xi): Construction of infrastructure or structures covering 50 square meters or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse. Excluding where such construction will occur behind the development setback line Proposed generation of electricity with an output of **250MW.** It is proposed to construct 132kV power line
Page 3	*GN R544 Item 18(i):* *The infilling or depositing of any material od more than 5 cubic metres into, or the dredging, excavation, removal or moving of*	*GN R544 Item 18(i):* *The infilling or depositing of any material od more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand,*

EA Reference	Current wording	Proposed amendment
	soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from a watercourse. *Proposed generation of electricity with an output of 100MW. It is proposed to construct 132kV power line*	*shells, shell grit, pebbles or rock or more than 5 cubic metres from a watercourse.* Proposed generation of electricity with an output of **250MW**. It is proposed to construct 132kV power line
Page 3	*GN R545 Item 1:* *The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.* *Proposed generation of electricity with an output of 100MW.* *It is proposed to construct 132kV power line*	*GN R545 Item 1:* The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more Proposed generation of electricity with an output of **250MW**. It is proposed to construct 132kV power line.
Page 4	*"- for the construction of a 100MW Photovoltaic facility with associated infrastructure on Portion 200 of Farm Nooitgedacht, Orkney, North West Province, Known as Vaal River Solar 3, hereafter referred to as "the property"*	"- for the construction of a **250MW** Photovoltaic facility with associated infrastructure on Portion 200 of Farm Nooitgedacht, Orkney, North West Province, Known as Vaal River Solar 3 Facility, hereafter referred to as "the property"

2.2. Amendment 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 to include the construction and operation of a Battery Energy Storage System (BESS) within the authorised development area for Vaal River Solar 3 PV Facility. The applicant is requesting an update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS) with a capacity of up to 250MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within a 2ha footprint within the authorised development footprint of Vaal River Solar 3 and does not trigger any additional Listed Activity nor increase the assessed footprint.

The BESS is planned to provide 5 hours of storage capacity, and the Li-On battery installation is proposed to be used. The battery installation would comprise multiple battery racks fully assembled in containerised/modular enclosures (battery containers).

The applicant requests an addition of Battery Energy Storage System (BESS) to the existing approved infrastructure on the original EA (12/12/20/2513/3):

EA Reference	Current wording	Proposed amendment
Page 4	The infrastructure associated with the facility include: » Photovoltaic solar panels; » Foundation to support the photovoltaic panels;	The infrastructure associated with the facility include: » Photovoltaic solar panels; » Foundation to support the photovoltaic panels;

	» Cabling between the project components; » Internal access roads; » Workshop area for operations, maintenance and storage; and » The construction of a 132kV powerline to connect the proposed PV facility with Eskom grid via the existing Jouberton-Hermes 132kV powerline	» Cabling between the project components; » Internal access roads; » Workshop area for operations, maintenance and storage; » **A Battery Energy Storage System (BESS),** and » The construction of a 132kV powerline to connect the proposed PV facility with Eskom grid via the existing Jouberton-Hermes 132kV powerline

2.3. Amendment 3: Extension of the validity of the Environmental Authorisation

Condition 6 of the original EA dated 10 October 2012 (12/12/20/2513/3) states that the proposed activity must commence within a period of three (3) years from the date of issue, which expired on 10 October 2015. The amended environmental authorisation dated 23 February 2015 (12/12/20/2513/3/AM1) extended the validity of the EA for an additional two (2) years, which expired on 10 October 2017. The second amended environmental authorisation dated 12 October 2017 (12/12/20/2513/3/AM3) extended the validity of the EA for additional two (2) years, which expired on 10 October 2019. The third amended environmental authorisation dated 25 October 2019 (12/12/20/2513/3/AM5), extended the validity of the EA for an additional three (3) years, which expires on the 10 October 2022.

The applicant, Vaal River Solar 3 (Pty) Ltd requests an extension to the validity of the EA by an additional 3 years from 10 October 2022 to 10 October 2025.

In this regard, the condition of the Amendment 4 (12/12/20/2513/3/AM4) is requested to be amended as the table below:

EA Reference	Current wording	Proposed amendment
Page 1	*The activity must commence within a period of three (03) years from the date of expiry of the amendment to the EA issued on 10 October 2017 (i.e. the EA lapse on 10 October 2022).*	The activity must commence within a period of three (03) years from the date of expiry of the amendment to the EA issued on 10 October 2022 (i.e the EA lapse on 10 October 2025).
Page 1	*Failure to commence with construction activities within the maximum 10-year period, your EA will be deemed to have lapsed and a new application for Environmental Authorisation will have to be lodged".*	Failure to commence with construction activities within the maximum **13-year period**, your EA will be deemed to have lapsed and a new application for Environmental Authorisation will have to be lodged"

3. MOTIVATION FOR THE REQUESTED AMENDMENTS

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

3.1. An increase of the total generation capacity of the Vaal River 2 PV Facility

The original EA dated 10 October 2012 (12/12/20/2513/3) read in conjunction with Amendment 4 issued on the 16 December 2018 (12/12/20/2513/3/AM4), which authorised a generation capacity of 100MW. The Applicant is proposing to amend the authorised capacity from 100MW to 250MW. PV panel heights and the development footprint of the facility will remain the same as those authorised. The requested amendment will not trigger any new listed activities.

Solar PV technology has advanced dramatically over the past 5 years with far higher efficiency levels than when the Vaal River Solar 3 PV Facility was originally developed. It is therefore possible to generate more energy from the same footprint through the implementation of new technology. At the present moment, South Africa is facing an energy crisis where solar PV and other renewable energy technologies will make up a greater percentage of new generation capacity procured by Eskom, and future rounds of REIPPP have increased the maximum capacity of solar PV generation facilities from the previous 75MW cap, as is evident in the current Round 6 REIPPPP bid request. Also, as a result of the amendment of Schedule 2 of the Electricity Regulation Act, there has been an increase in the need for mining and other intensive energy to procure and wheel electricity from independent power producers for facilities up to 100MW. It has also been demonstrated that larger plants can achieve lower tariffs through economies of scale and will benefit South African electricity consumers and contribute to the decarbonisation of the electricity system. Increase in the capacity of the facility will provide an opportunity for this project to be bid at higher capacity than is currently authorised.

The conceptual layout used for the original EIA approval anticipated the deployment of 250–265-watt panels, which were the norm at the time that the approval was given in 2012. There has, over the last 10 years since 2012, been a significant increase in the efficiency of the output of solar PV panels due to constant changes and advancements in technology. This means that more power can be generated per m^2 of panel using a PV module developed in 2022 than a PV module developed in 2012. This has meant that the 250–265-watt modules originally used as the reference panel for the layouts used in 2012 can now be replaced by more efficient modules. The panels themselves are of similar size in either case, and it is the photovoltaic cells which are more efficient, therefore resulting in an increased output capacity from panels within the approved development footprint. The realised benefit is an increased capacity with no other physical changes to the planned facility. The utilisation of more efficient panels will result in an increase in the total generation capacity of the facility.

This increase in output capacity is therefore related to an advancement in technology. All other factors remain the same as assessed in the EIA. The increase in output will not:

- result in an increase in the development footprint area;
- result in a change to the size and functional mechanisms of the PV panels.

The latest module designs are considered to be super high efficiency modules. The features of these modules which make them more efficient include:

- Higher power classes for equivalent module sizes
- High module efficiency
- Low hot spot temperature risk, which makes the panels safer for use
- Low temperature coefficient
- More power output as a result of low NMOT (Nominal Module Operating Temperature) of 43 ± 2°C

The new super high efficiency PV modules result in more effective harnessing of solar energy in order to increase the generating capacity. It is therefore requested that the generation capacity of the PV facility in the EA be amended to 250MW.

All specialists (ecology, heritage, palaeontology, soils and agricultural potential, visual and social specialists) have confirmed that the increase in the generation capacity will not result in a change in the significance of identified impacts or any additional impacts (refer to **Appendix A-E**).

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 Battery Energy Storage System (BESS) with a capacity of up to 250MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within a 2ha footprint within the authorised development footprint of Vaal River Solar 3, is outside of any areas of environmental sensitivity, and does not trigger any additional Listed Activity nor increase the assessed footprint. The applicant requests an addition of Battery Energy Storage System (BESS) to the existing approved infrastructure. The position of the 2ha areas for the BESS infrastructure is indicated on **Figure 3.2.** The BESS is planned to provide 5 hours of storage capacity, and a modular Li-On battery installation is proposed to be used.

Each modular Li-On pack arrives from the factory fully-assembled and pre-tested in one containerised/modular enclosure, which includes battery modules, bi-directional inverters, a thermal management system, an AC main breaker and controls. No assembly is required on site which significantly reduces complexity and ensures an easy installation and connection process. These compact modules also increase the energy density of the battery, reducing the amount of space required on the site (**Figure 3.1**).

Figure 3.1: Conceptual design of a BESS indicating the use of modular containers

This addition of a BESS is related to an advancement in technology since the project was originally proposed. All other factors remain the same as assessed in the EIA. The inclusion of a BESS will not:

- result in an increase in the development footprint area;
- result in a fundamental change to construction activities on the site;
- trigger any listed or specified activity as outlined in Regulation 31 of the EIA Regulations, 2014 (as amended).

As regards battery energy storage systems, DFFE confirmed the following (refer communication from 2020):

1. *Installations, facilities or infrastructure related to the development (or expansion) of battery energy storage systems, will not trigger any of the activities related to the development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity, quantified by the relevant threshold for the activity listed or specified in the relevant Listing Notice.*
2. *The interpretation is based on the fact that the relevant activities relate to the development and operation (or expansion and operation) of a facility or infrastructure for the storage, or storage and handling of a dangerous good in a container/ containers in volumes that may meet or exceed the thresholds specified under the 3 Listing Notices. Batteries are not regarded as facilities or infrastructure for the storage or storage and handling of a dangerous good, considering that its inherent purpose or objective is not to store, or store and handle a dangerous good and that a battery is not considered a "container", for the purposes of the interpretation of these Regulations.*

The general purpose and utilisation of the BESS will be to store excess electrical output from the solar energy facility as it is generated, allowing for a notified release into the national grid when the capacity is required. The national REIPPP procurement programme has increased the maximum capacity of projects from 75 MW to 240 MW, and in addition has included the option of offering ancillary services which could be supplied by BESS. 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 250MW solar energy facility.

The establishment of the battery energy storage system is an efficient technology considered to improve energy security by supplying energy during peak demands, unfavourable climatic conditions or during maintenance of the solar PV. The IRP 2019 states the following on energy storage: "*There is a complementary relationship between Smart Grid systems, energy storage, and non-dispatchable renewable energy technologies based on wind and solar PV. The traditional power delivery model is being disrupted by technological developments related to energy storage, and more renewable energy can be harnessed despite the reality that the timing of its production might be during low-demand periods. Storage technologies including battery systems, compressed air energy storage, flywheel energy storage, hydrogen fuel cells etc. are developments which can address this issue, especially in the South African context where over 6 GW of renewable energy has been introduced, yet the power system does not have the requisite storage capacity or flexibility*."

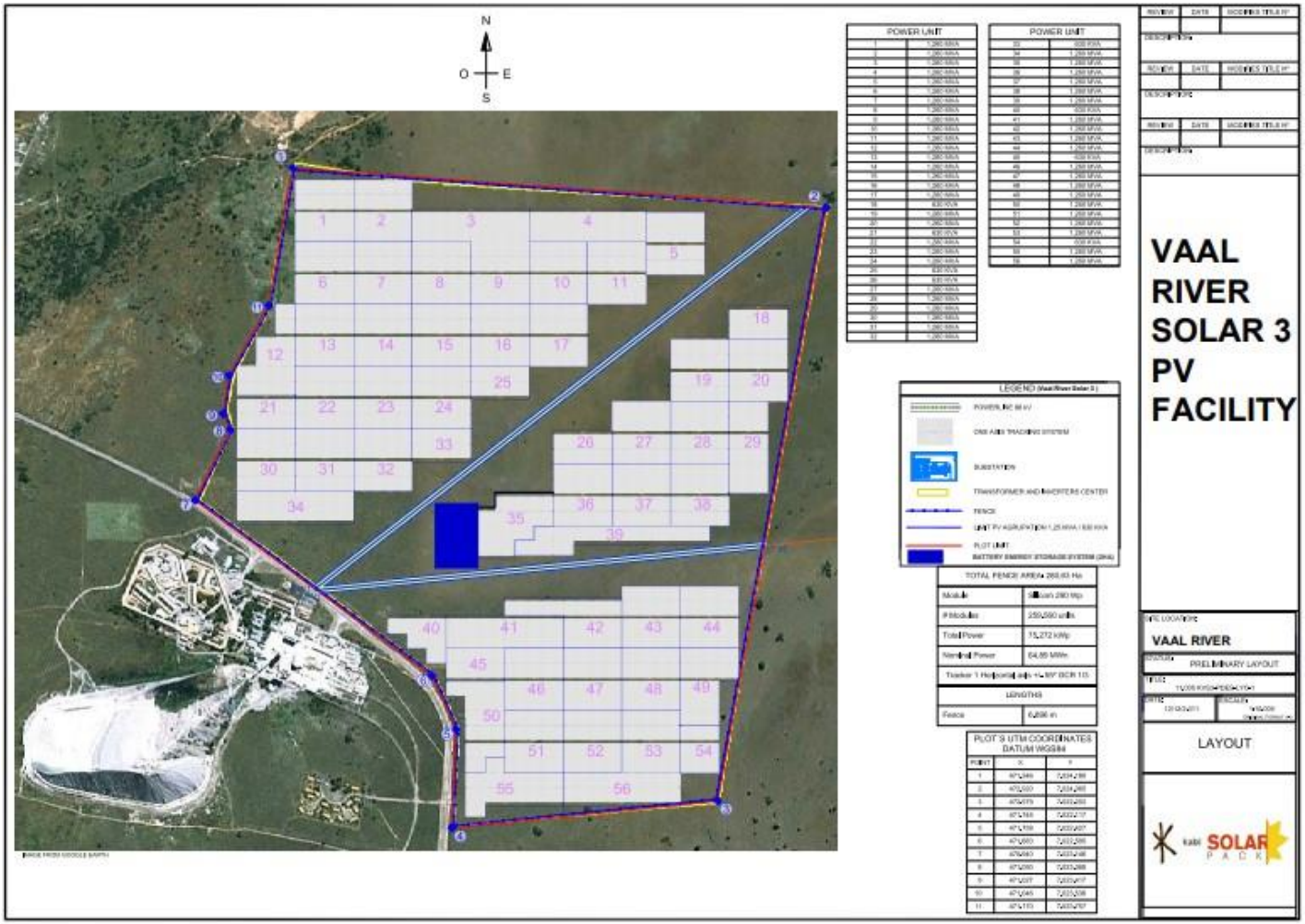

Figure 3.2: Map showing the layout of the BESS within the authorised development footprint of the solar PV facility

3.3. Extension of the validity of the Environmental Authorisation

Condition 6 of the original EA dated 10 October 2012 (12/12/20/2513/3) states that the proposed activity must commence within a period of three (3) years from the date of issue, which expired on 10 October 2015. The amended environmental authorisation dated 23 February 2015 (12/12/20/2513/3/AM1) extended the validity of the EA for an additional two (2) years, which expired on 10 October 2017. The second amended environmental authorisation dated 12 October 2017 (12/12/20/2513/3/AM3) extended the validity of the EA for additional two (2) years, which expired on 10 October 2019. The third amended environmental authorisation dated 25 October 2019 (12/12/20/2513/3/AM5), extended the validity of the EA for an additional three (3) years, which expires on the 10 October 2022. The applicant, Vaal River Solar 3 (Pty) Ltd requests an extension to the validity of the EA by an additional 3 years from 10 October 2022 to 10 October 2025.

The key motivating factor for the request to amend the EA validity period, is to ensure that the applicant has a project that is compliant with the requirements of the Department of Mineral Resources and Energy ("DMRE") (previously the Department of Energy) Renewable Energy Independent Power Producer Procurement ("REIPPP") Programme. Due to various reasons, outside of the Applicant's control, the planned announcements and roll-out of bidding rounds have not occurred as previously planned for. As a result, the REIPPP Programme has been delayed, resulting in the project not yet being selected as a preferred bidder, further necessitating the need for the EA validity period to be extended.

Extension of the validity of the EA will ensure that the EA remains valid for the undertaking of the authorised activities such that the project can be bid into future bidding rounds of the REIPPP Programme or similar programmes.

Between 2011 and 2015, 302 bids were submitted in support of the REIPPP Programme with around 30% (92) of the projects being awarded. Following these bid rounds, there was a significant delay in the signing of Power Purchase Agreements by Eskom, and as a result no further bid rounds were opened between 2015 and 2021. It is well understood that the nature of this bidding process is highly competitive, and that two additional bid windows are planned for 2022, with BW6 planned for submission in August 2022. However, there is some uncertainty around the planned bid window submission and award dates, and as has been shown in the past, these dates may change at short notice, and impact on the Applicant's ability to participate in the process, as this EA validity as it currently stands lapses in October 2022.

The project site was specifically selected in 2011 by the then landowner, AngloGold Ashanti Ltd. (AGA), as the opportunity to consider the alternative use of mining land for solar PV deployment and operations. As such, the development agreements between Vaal River Solar 3 and both AGA and the current landowner, Harmony Moab Khotsong Pty Ltd (Harmony), prevents any activity on the land that would impede the construction and operation of a solar PV generating facility for a 20-year period. The site has been used for no other activity over the intervening period which would change the environmental impacts and mitigations identified in the original application. On 15 March 2021, the City of Matlosana Local Municipality amended the land use of the Project site from "Mining and Quarrying" to "Special – for the purposes of a Solar PV Generation Plant, Office, control room, workshop for maintenance, storeroom and related purposes with the special consent of the Local Authority". Further, the surrounding land use remains conductive to the development of a solar PV facility and no land use conflict is foreseen.

The project site is located within the Klerksdorp REDZ, which was specifically designated in February 2021 (GNR144) as a REDZ for the deployment of PV on mining land and to assist in South Africa's Just Energy Transition. The area was considered favourable for the development of solar PV facilities by DFFE through their SEA process of defining the REDZ areas. In addition, the Vaal River Solar 3 project has been identified as a priority project in the City of Matlosana 2021 Spatial Development Plan. The site is one of the anchor projects within the area specifically designated for solar PV projects and is included in the Urban Spatial proposal for the Klerksdorp/Orkney/Stilfontein area (refer to Appendix G).

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

In terms of Conditions 5 of the EA dated 10 October 2012 and Regulation 29 of the EIA Regulations 2014, as amended, 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. An application in this regard has been submitted to the DFFE who have confirmed that the applications fall within the ambit of a Part 1 amendment process. Further to the receipt of the application, the DFFE have requested additional information be provided in the way of a site verification and motivation report, and that a public participation process be undertaken in support of the application.

The amendments to extend the EA validity, increase the contracted capacity of the solar PV facility to 250MW and to develop a BESS with a capacity of up with a capacity of up to 250MWh will not increase the level, nature or significance of impacts which were initially assessed, and the amendments will take place within the authorised development footprint.

The results of the review of all specialist studies undertaken in 2012, and a current assessment, including a site verification evaluation providing an indication of the status of the receiving environment (by the relative specialists) is included in **Section 5**.

5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE REQUESTED AMENDMENTS

The Department of Forestry, Fisheries and the Environment (DFFE) in reference to Regulation 30(1)(a) requires assessment of the impacts related to the proposed amendments. Understanding the nature of the proposed amendments and the impacts associated with the project (as assessed within the EIA), the following has been considered:

- Impacts on Ecology (including flora, fauna and avifauna)
- Soil and Agricultural Potential Impacts
- Heritage Impacts (including archaeology and palaeontology)
- Visual Impacts
- Impacts on the Social Environment

The potential for change in the significance and/or nature of impacts based on the proposed amendments as described within this Site Verification and Motivation Report is discussed below and detailed in the specialists assessment reports (conducted in 2022) contained in **Appendix A - E**[1]. This section of the Site Verification and Motivation Report must be read together with the specialist reports contained in **Appendix A - E** in order for the reader to obtain a complete understanding of the proposed amendments and the implications thereof.

5.1. Current Status of the Environment

The table below describe the current status of the project environment:

Topography	The topography of the site remains unchanged as assessed in the EIA process in 2012. The elevation on site varies from 1330 m to 1344 m above sea level over a distance of 1.5 km, which is a very gentle slope.
Climate	Current status is still the same as what was assessed in the EIA process in 2012.
Land use type	Property previously used for mining and is surrounded by mine dumps The property is now owned by Harmony Gold Limited. The site is one of the anchor projects within the area specifically designated for solar PV projects, as indicated in the City of Matlosana 2021 Spatial Development Plan.
Vegetation	The study site falls within the Vaal Reefs Dolomite Sinkhole Woodland vegetation type and according to the latest available vegetation type data (SANBI, 2018) this vegetation type is now classified as Least Concern and not classified as Least Threatened as indicated in the original assessment. The project site comprises of a natural grassland in a moderate to poor condition due to long term overgrazing and frequent burning.
Fauna and Avifauna	Based on the latest IUCN and South African Red Data Lists (IUCN 2021.3 and 2016 Mammal Red List of South Africa Lesotho and Swaziland) no Mammal SCC were recorded within the project site and it is highly unlikely that development will impact any individuals and/or populations.

[1] It must be noted that the original specialists who undertook the EIA studies have been used for these assessments 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 amendments.

	Based on the latest IUCN and South African Red Data Lists (IUCN 2021.3 and 2015 Bird Red List of South Africa Lesotho and Swaziland) no Bird SCC were recorded within the project site and it is highly unlikely the that development will impact any individuals and/or populations of Bird SCC
Soils and Agricultural Potential	The results of the site assessment agree with the findings of the initial assessment regarding the dominant soil forms. Since the South North west Soil classification system was updated since the initial assessment, the new system published by the Soil Classification Working Group in 2018, is used to describe the soil forms on site. The site consist of the Mispah/Glenrosa soils and Nkonkoni/Vaalbos soils. The largest part of the project area has Low agricultural potential. Low agricultural potential has been assigned to the Mispah/Glenrosa soil group because of the shallow soil depth that limits root growth and water storage capacity within these profiles. Some areas where these soils occur also have chunks of rocks on the surface.
Wetlands	There are no freshwater features in the study area.
Heritage	No archaeologically relevant changes are evident as compared to the initial assessment, and it is unlikely that previously unidentified heritage resources will now be evident within the area proposed for development. Stromatolites were identified within the area proposed for the Vaal River Solar development. These kinds of stromatolites are known to occur within the Chuniespoort Group - as per the SAHRA Fossil Heritage Browser, the Chuniespoort Group is known to conserve a "Range of shallow marine to intertidal stromatolites (domes, columns etc), and organic-walled microfossils". As such, it is recommended that a Chance Fossil Finds Procedure be added to the EMPr for the proposed development (Attached as Appendix 1 of Heritage Specialist report).
Social Characteristics	The project is located within a mining area and the local economy is dominated by the mining industry. The declining mining economy in the area has caused an increase in the unemployment. levels. There has been no change in land use for the proposed development site, no new developments have been constructed on or near the development site, and the land use zoning (mining) remains the same. The site is one of the anchor projects within the area specifically designated for solar PV projects, as indicated in the City of Matlosana 2021 Spatial Development Plan.
Visual Characteristics	The description of the affected environment, as described in the original VIA report remains unchanged. There has been no change in land use for the proposed development site, no new developments have been constructed on or near the development site (no similar developments within a 30km radius), and the land use zonation (mining) remains the same.

The current status in the surrounding environment remains unchanged. No new developments have been constructed on or near the development site (no similar developments within a 30km radius), and the land use remains the same. The use of this area has been highlighted in the City of Matlosana 2021 Spatial Development Plan.

A change detection of satellite images of the site from 2012 compared to images of the site in 2022 are included in **Figures 5.1** and **5.2** below. The only land use activity that became evident from the change detection exercise, is the gradual reclamation of the existing mine dumps in closer proximity to the site over a 10-year period.

The above conclusion was also verified through consultation with the current land/mining rights owner(s) i.e., Harmony Gold Limited.

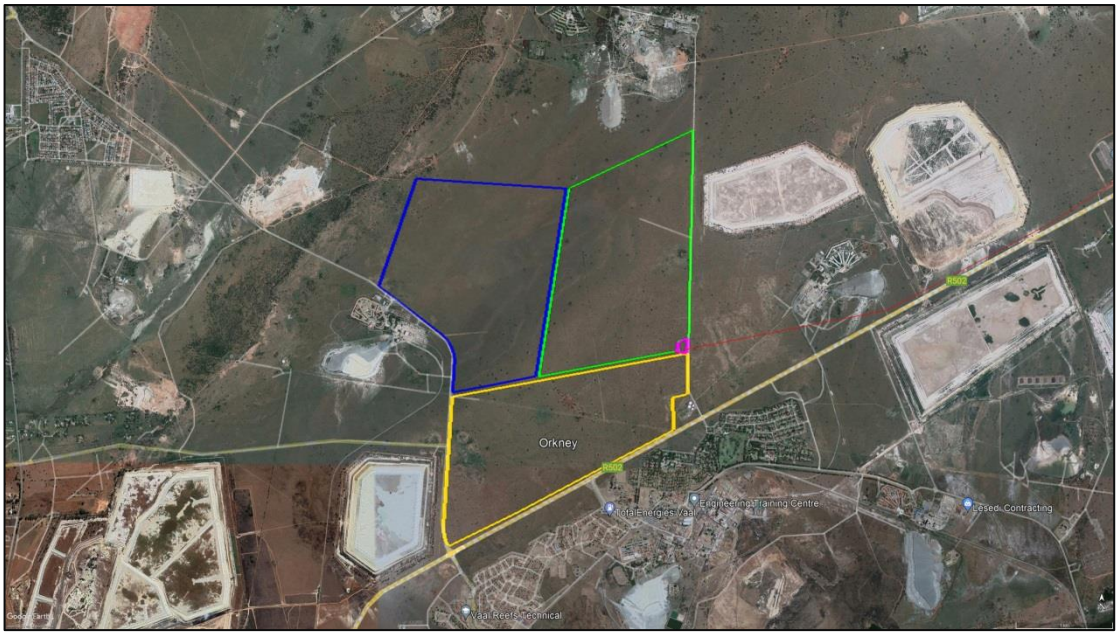

Figure 5.1: Vaal River Solar Site and surrounds 2012

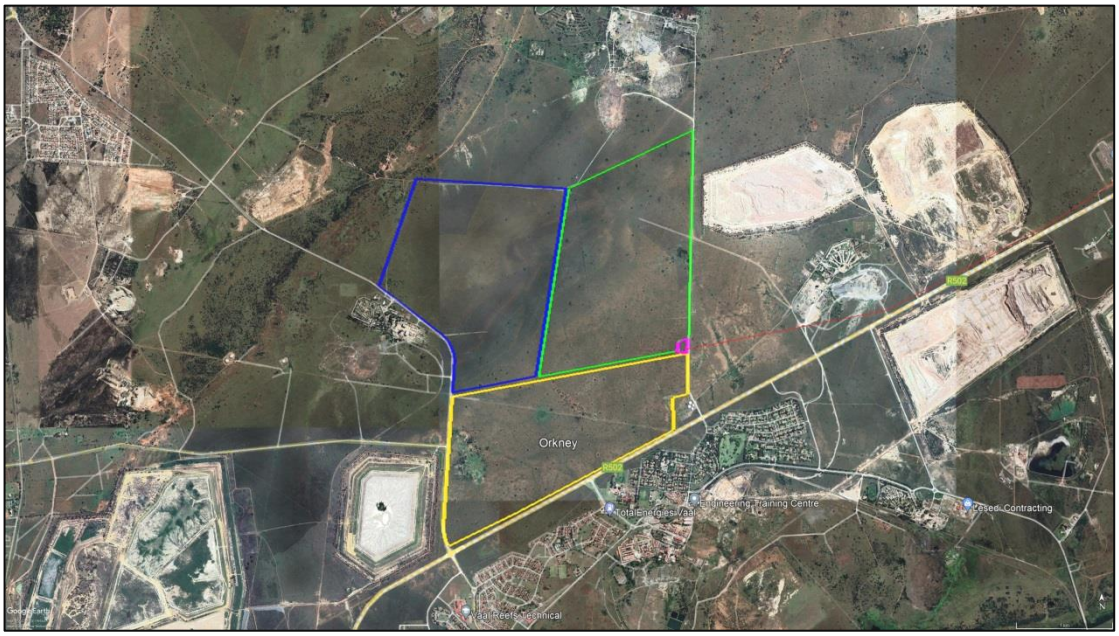

Figure 5.2: Vaal River Solar Site and surrounds 2022

The project site is located within the Klerksdorp REDZ, which was specifically detailed as a REDZ for the deployment of PV on mining land and to assist in South Africa's Just Energy Transition. The area was considered favourable by DFFE through their SEA process of defining the REDZ areas. The following renewable energy projects have been authorised in the area. No projects are yet preferred bidder or constructed.

Solar Projects in the area	**Solar developments in the immediate surroundings (within a 30km radius) from Vaal River Solar 3 Facility:** • **Buffels Solar PV 1 Facility** • **Orkney Solar PV** • **Vaal River Solar 1 Photovoltaic Facility** • **Vaal River Solar 2 Photovoltaic Facility**

5.2. Impacts on Ecology (including flora and fauna)

The Ecological Specialist Motivation Report (**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. A site assessment/verification survey was undertaken in June 2022.

According to the vegetation data, that was used at the time of the initial study, the entire project site was located within a single vegetation type, namely Vaal Reefs Dolomite Sinkhole Woodland. This vegetation type was classified as Least Threatened (Mucina & Rutherford 2006). In his ecological report during the initial assessment, Hoare (2012) indicated that there are fauna species listen in the Red data list (4 mammals, 5 birds, 1 amphibian and 1 reptile (near threatened)) which have potential of occurring within the project site, however none of the species were confirmed being present onsite during the site assessment undertaken in 2012.

During the ecological site assessment in 2022 associated with the proposed amendments, the vegetation unit covering the project site has been confirmed as Vaal Reefs Dolomite Sinkhole Woodland (SANBI, 2018) and according to the latest available vegetation type data (SANBI, 2018) this vegetation type is now classified as Least Concern and not Least Threatened as indicated by the initial assessment. It Is further noted that this vegetation type is furthermore not listed within the list of threatened terrestrial ecosystems for South Africa as published on 9 December 2011 (G 34809, GoN 1002).

It is not anticipated that this development will have an impact on Vaal Reefs Dolomite Sinkhole Woodland vegetation in good to pristine condition that is worthy of conservation due to the size and location of the project site within a moderate to poor condition grassland. As a result, this development is unlikely to have an impact on the status of this vegetation type as well as the conservation target set out for this vegetation type.

Throughout the entire site, tufted-perennial-climatic increaser 3 grasses like *Aristida diffusa*, *Eragrostis chloromelas*, and *Triraphis andropogonoides* dominate the graminoid layer (grass layer). *Themeda triandra* and *Digitaria eriantha* are largely absent, and the dominance of these grass species is a sign of the extensive overgrazing that this area has experienced. These three plants, which are mostly unpleasant, hardy, and rather dense, flourish in overgrazed and selectively grazed veld. A relative well-represented forb layer, some of whose species resemble karroid elements, is present alongside the graminoid layer (e.g. *Osteospermum muricatum*, *Chrysocoma ciliata*, *Pentzia* spp. and Felicia muricata). Due of persistent overgrazing, these karroid species are also frequently linked to an advanced state of deterioration.

The requested amendments will have no change to the significance rating of the impacts identified and evaluated in the Hoare study (2012). The significance rating of the consequences identified and evaluated within the report put together by Hoare (2012) will also not be affected by these elements because land-cover and land-use have remained largely unaltered over the last 10 years. According to Hoare (2012), no high/very high sensitive and "No-Go" areas were identified **(Figure 5.3).** The bulk of the project site can be classified as medium-high Sensitive (natural grasslands of a Vulnerable Vegetation Unit which is a moderate to poor condition). All disturbed and transformed areas have been classified as low sensitive.

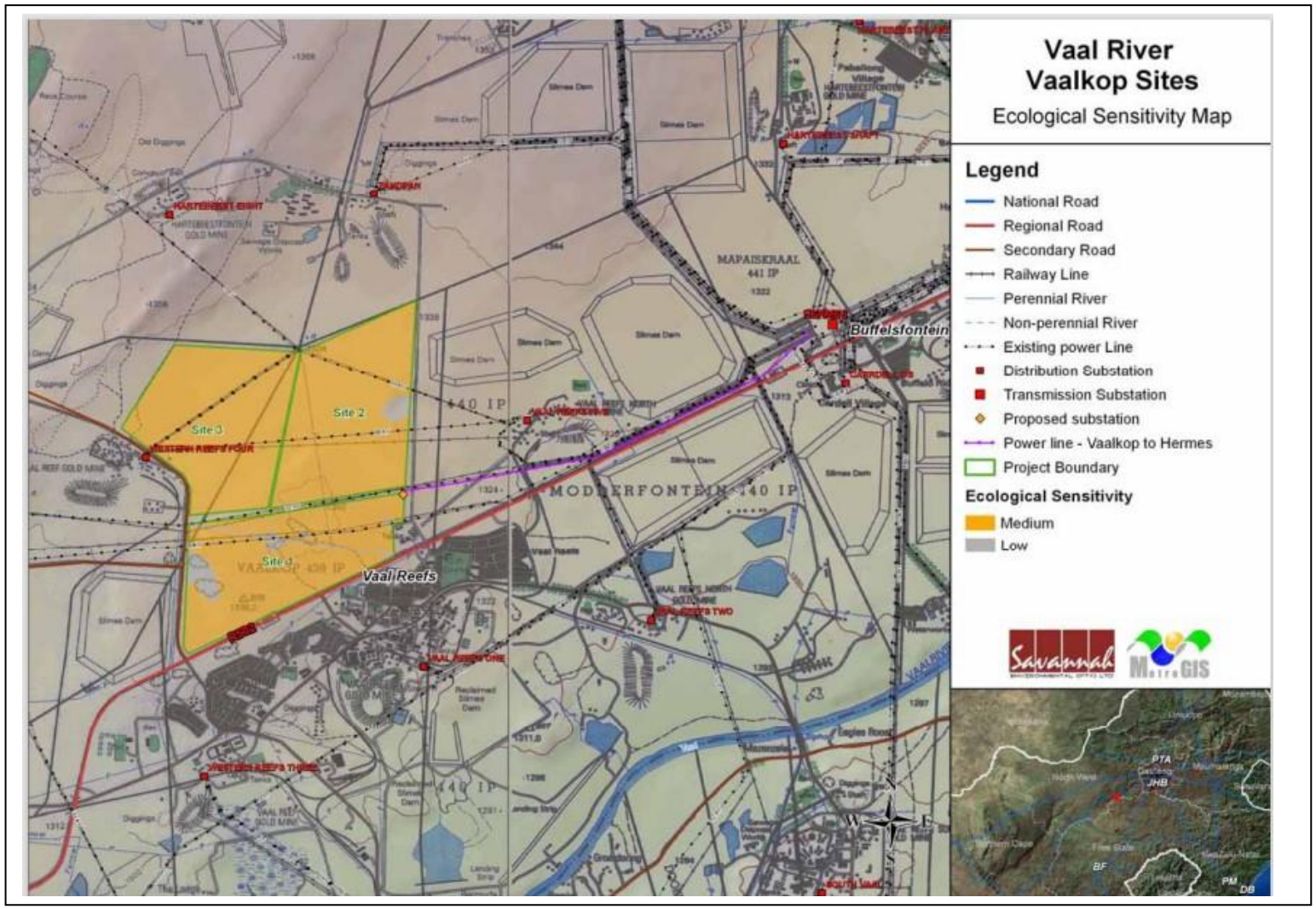

Figure 5.3: The ecological sensitivities within the authorised development footprint of the solar PV facility as well as within the development area of the BESS (map abstracted from original EIAr, 2012)

It can therefore be concluded that the significance ratings provided by Hoare (2012) will remain unchanged and are still applicable, as there are no additional impacts brought by the requested amendments. A cumulative impact of this development and other surrounding developments (within a radius of 30km) were not considered/assessed during the original Ecological Impact Assessment. An assessment of the potential cumulative impact of the development, including the addition of a BESS, has been included within the Specialist Ecological Report **(Appendix A)** and is discussed below.

5.2.1. Cumulative Assessment

Existing solar energy projects were considered in terms of their potential cumulative terrestrial ecological impacts that are in an approximate 30 km radius of the Vaal River Solar 2 Facility. It was found that all the potential cumulative impacts associated with the Solar PV projects planned within the area (30km radius) can be regarded as Low due to the fact that the landscape between these developments are highly fractured and natural areas are fairly isolated from one another.

Cumulative Impact 1: Reduced ability to meet conservation obligations and targets

Impact Nature: The loss of unprotected vegetation types on a cumulative basis from the broader area impacts the countries' ability to meet its conservation targets		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects within the area**
Extent	Local (1)	Regional (3)
Duration	Long Term (4)	Long-Term (4)
Magnitude	Small (0)	Minor (2)
Probability	Very Improbable (1)	Improbable (2)
Significance	**Low (5)**	**Low (18)**
Status	Slightly Negative	Slightly Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	Yes, to a large extent	
Mitigation	» The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas. » An open space management plan should be developed for the site, which should include management of biodiversity within the fenced area, as well as that in the adjacent rangeland. » Reduce the footprint of the facility within sensitive habitat types as much as possible.	

Cumulative Impact 2: Impacts on Broad-Scale Ecological Processes

Impact Nature: Transformation of intact habitat could potentially compromise ecological processes as well as ecological functioning of important habitats and would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects within the area**
Extent	Local (1)	Regional (2)

Duration	Long Term (4)	Long Term (4)
Magnitude	Small (1)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (12)**	**Low (20)**
Status	Neutral – Slightly Negative	Slightly Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	Likely
Can impacts be mitigated?	Yes, to a large extent	
Mitigation	» The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas. » An open space management plan should be developed for the site, which should include management of biodiversity within the fenced area, as well as that in the adjacent rangeland. » Reduce the footprint of the facility within sensitive habitat types as much as possible. » Small to medium sized mammals can be allowed to move between the development area and surrounding areas by creating artificial passageways underneath boundary fences (this is optional and may be implemented by developer if deemed necessary).	

Cumulative Impact 3: Cumulative impacts due to nearby renewable energy developments

Impact Nature: Cumulative loss of habitats (including sensitive habitats) and further increase in the fractured nature of the landscape may lead to the loss of features responsible for maintaining biodiversity and providing ecosystem goods and services and may potentially lead to;

» A change in the status of Vaal Reefs Dolomite Sinkhole Vegetation, subsequently also reducing the ability to meet national conservation obligations and targets;
» A reduction in biodiversity and even the loss of some species from the area;
» Fracturing and isolation of landscapes may cut off important migration routes and prevent genetic variability thus reducing "genetic health" which may in turn lead to weaker species incapable to adapt and react to potential environmental changes and consequently also to a reduction in biodiversity and the extinction of some species from certain areas.
» The loss of important corridors essential for some species to allow for movement between important habitat types crucial for the survival of these species.

	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects within the area**
Extent	Local (1)	Regional (2)
Duration	Long Term (4)	Long Term (4)
Magnitude	Small (0)	Minor (2)
Probability	Very Improbable (1)	Improbable (2)
Significance	**Low (5)**	**Low (16)**
Status	Neutral	Slightly Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	Likely

Can impacts be mitigated?	Yes, to a large extent
Mitigation	» The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas. » An open space management plan should be developed for the site, which should include management of biodiversity within the fenced area, as well as that in the adjacent rangeland. » Reduce the footprint of the facility within sensitive habitat types as much as possible. » Small to medium sized mammals can be allowed to move between the development area and surrounding areas by creating artificial passageways underneath boundary fences (this is optional and may be implemented by developer if deemed necessary).

5.2.2. Additional Mitigation Measures

Based on the cumulative ecological impact assessment, the following mitigation measures are recommended:

» The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas.
» An open space management plan should be developed for the site, which should include management of biodiversity within the fenced area, as well as that in the adjacent rangeland.
» Reduce the footprint of the facility within sensitive habitat types as much as possible.
» Small to medium sized mammals can be allowed to move between the development area and surrounding areas by creating artificial passageways underneath boundary fences (this is optional and may be implemented by developer if deemed necessary).

Mitigation measures pertaining to the confirmation of protected plants within the project site:

» Preconstruction walk-through of the final development footprint for protected species that would be affected and that can be translocated.
» Before construction commences individuals of listed provincially protected plant species within the development footprint that would be affected, should be counted and marked and translocated where deemed necessary and possible by the ecologist conducting the pre-construction walk-through survey, and according to the recommended ratios. Permits from the relevant provincial authorities, will be required to relocate and/or disturb listed plant species.
» Any individuals of protected species affected by and observed within the development footprint during construction should be translocated under the supervision of the ECO and/or Contractor's Environmental Officer (EO).

5.2.3. Conclusion

The specialist concluded that the proposed amendments for Vaal River Solar 3 PV Facility will not impact any additional areas of natural vegetation as well as sensitive faunal species or sensitive faunal/avifauna habitats. The proposed amendments will result in similar impacts as was identified and assessed within the Ecological Impact Assessment conducted by Hoare 2012. Impacts identified within the original report are, therefore, still applicable for the proposed amendments. No additional impacts or change in impact

significance will result because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments as the environment has not changed (additional mitigation proposed is related to the potential for cumulative impacts as the site is within a REDZ).

From an ecological (faunal, floral and avifaunal) perspective, there is no objection to the proposed amendments. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low due to the fact that the landscape between these developments are highly fractured and natural areas are fairly isolated from one another.

The only additional mitigation measures recommended to be included in the EMPr relates to the assessed cumulative impacts as well as the potential impact on the protected plant species that have been identified during the survey of the development site (Ecological Motivation Report in **Appendix A**).

It is recommended that a pre-construction fauna and flora walk-through is conducted by a registered botanical specialist, prior to the commencement of any construction activities. The purpose of the walk-through will be to locate and identify any conservation important plant species or fauna within the development footprint and assist with the permitting requirements.

5.3. Soil and Agricultural Potential Impacts

The Soil and Agricultural Potential Impact Assessment undertaken by Van der Waals (2012) described the northern section of the project area as dominated by deep Hutton soil profiles with dolomite outcrops visible on the soil surface. The southern part of the project area is dominated by shallow, rocky soil profiles of the Mispah and Glenrosa forms.

The agricultural potential of the site is low for crop production as the shallow, rocky soil profiles are considered unsuitable for dryland crop production. The assessment states that the area is suitable for extensive grazing and has relatively high grazing capacity. However, it was also stated that the area is fragmented by roads and several landowners which makes livestock grazing more challenging. The presence of dolomite in the area that poses a risk for sinkholes, was provided as the reason why irrigated agriculture in the area is not a suitable land use option.

For the proposed amendments, the Soils and Agricultural Potential specialist undertook a site verification assessment (**Appendix B**) found that the impacts identified within the original report are still applicable for the proposed amendments. No additional impacts or change in impact significance will occur because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments because the land use on-site and the land potential remains the same to identified during the original EIA process.

From a Soils and Agricultural Potential perspective, there is no objection to the proposed amendments. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

5.3.1. Cumulative Assessment

The cumulative impacts of the proposed project in addition to the authorised solar developments within the 30km radius are rated and discussed below.

Nature: Decrease in areas with suitable land capability for cattle farming.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Very short duration - 0-1 years (1)	Short duration – 2 – 5 years (2)
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	**Low (12)**	Low (24)
Status (positive/negative)	Negative	Negative
Reversibility	High	Low
Loss of resources?	No	Yes
Can impacts be mitigated?	N/A	No
Confidence in findings: High.		
Mitigation: • Vegetation clearance must be restricted to areas where infrastructure is constructed. • No materials removed from development area must be allowed to be dumped in nearby livestock farming areas. • Prior arrangements must be made with the landowners to ensure that livestock are moved to areas where they cannot be injured by vehicles traversing the area. • No boundary fence must be opened without the landowners' permission. • All left-over construction material must be removed from site once construction on a land portion is completed. • No open fires made by the construction teams are allowable during the construction phase.		

Nature: Increase in areas susceptible to soil erosion		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Medium (30)**	**Medium (33)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No
Confidence in findings: High.		
Mitigation: • Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint; • Unnecessary land clearance must be avoided;		

- Level any remaining soil removed from excavation pits (where the PV modules will be mounted) that remained on the surface, instead of allowing small stockpiles of soil to remain on the surface;
- Where possible, conduct the construction activities outside of the rainy season; and
- Stormwater channels must be designed to minimise soil erosion risk resulting from surface water runoff.

Nature:
Increase in areas susceptible to soil erosion

	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Probable (3)
Significance	**Low (16)**	**Low (27)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Confidence in findings:
High.

Mitigation:
- Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint;
- Unnecessary land clearance must be avoided;
- Materials must be off-loaded and stored in designated laydown areas;
- Where possible, conduct the construction activities outside of the rainy season; and
- Vehicles and equipment must park in designated parking areas.

Nature:
Increase in areas susceptible to soil pollution

	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Medium (30)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No

Confidence in findings:
High.

Mitigation:
- 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;
- The construction site must be monitored by the Environmental Control Officer (ECO) to detect any early signs of fuel and oil spills and waste dumping;

- Ensure battery transport and installation by accredited staff / contractors; and
- Compile (and adhere to) a procedure for the safe handling of battery cells during transport and installation.

5.3.2. Conclusion

Following the data analysis and cumulative impact assessment above, it is concluded by the specialist that the previously authorised Vaal River Solar 3 Facility is still considered an acceptable development in the project area, even with the requested amendments now made by the applicant. Impacts identified within the original report are, therefore, still applicable for the proposed amendments. No additional impacts or change in impact significance will result because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments as the environment has not changed.

There is no objection to the proposed amendments. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low.

5.4. Heritage Impacts (including Archaeological and Palaeontology Assessments)

According to the heritage study of a nearby PV Facility that was conducted by Van der Walt (2016 SAHRIS ID 385181), it was noted that no scenic significant cultural landscapes or viewscapes were noted during the fieldwork within the area. During the heritage study done by Coetzee (2012) as part of the original EIA process, it was noted that "the cultural landscape around Klerksdorp is not only complex but also has a deep time depth. The area s multi-layered with several compounding aspects: The town and surrounding areas have a long period of development and western occupation; Several features and events associated with the Second Boer War are known in the area; Iron Age settlements occur in the area along or near the Vaal River and Stone Age sites (including Rock Art) are known in the area.

Despite the general heritage sensitivity of the broader area, Coetzee (2012) identified no heritage resources of significance within the area proposed for the Vaal River Solar 3 PV Facility.

As per the site verification field inspection conducted by Dr. Presnyakova in June 2022, to determine if the landscape has been subject to any changes that may impact the findings outlined in Coetzee (2012), such as the exposure of new sensitive subsurface sediments/deposits that were not visible during the original survey. Dr. Presnyakova determined that no archaeologically relevant changes are evident based on the verification survey that was undertaken, and it is unlikely that previously unidentified heritage resources will now be evident within the area proposed for development.

In the Palaeontology Impact Assessment (PIA) completed by Maford (2012) for this project, "The rocks here are dolomite and chert and are between 2640 and 2500 million years old (Eriksson et al. 2006). The rocks are too old to contain vertebrate and plant fossils (Plumstead, 1969; McCarthy and Rubidge, 2005; Taylor et al. 2009). The dolomites may contain traces of unicellular algae that were involved in their formation, but this is unlikely.

The results of the site verification process (2022), stromatolites were identified within the area proposed for the Vaal River Solar development **(Figures 5.4 and 5.5)**. These kinds of stromatolites are known to occur within the Chuniespoort Group - as per the SAHRA Fossil Heritage Browser, the Chuniespoort Group is known to conserve a "Range of shallow marine to intertidal stromatolites (domes, columns etc), and organic-walled microfossils". As such, it is recommended that a Chance Fossil Finds Procedure be added to the EMPr for the proposed development (attached as Appendix 1 in the Heritage motivation report).

Figure 5.4: Image of stromatolites in the development area taken 11 June 2022

Figure 5.5: Image of stromatolites in the development area taken 11 June 2022

5.4.1. Cumulative Assessment

No additional heritage cumulative impacts were identified by the specialist as a result of the proposed amendments. Therefore, the cumulative impacts identified by the Heritage Impact Assessment (Coetzee 2012)) remain unchanged and would be applicable for the proposed amendments.

5.4.2. Additional Mitigation Measures

Based on more recent requirements by SAHRA, the following additional mitigation measures are recommended:

- The inclusion of a Chance Finds Procedure to the EMPr - The Heritage specialist recommend that the chance finds of palaeontological material adopted from the Heritage Western Cape (HWC) Chance Fossils Finds Procedure: June (2016) be added to the EMPR. This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (refer to Heritage motivation report **Appendix C).**
- Archaeological and Palaeontological walkdowns must be undertaken for the final layout prior construction – SAHRA recommended that a report on the outcomes of the walkdown must be submitted to SAHRA for comment, and construction may not commence without feedback from SAHRA on the report.

» Findings are to be reported - If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Elijah Katsetse/Phillip Hine 021 462 4502) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule. In addition, if unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqalabutho Madida 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.
» Appropriate specialists are to be appointed for on-site inspections - If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA

5.4.3. Conclusion

The specialist concluded that based on the findings of the Heritage Impact Assessment (Coetzee 2012) and results of the site survey conducted in 2022 (refer to **Appendix C**) there is no objection to the authorisation of the proposed amendments for Vaal River Solar 3 PV Facility. Archaeological and palaeontological heritage resources reflect the environments of the deeper past and are unlikely to change significantly in as short a geological time span as 10 years. Some changes to heritage resources may result from processes of erosion and deflation but, in this particular ecological setting, would likely represent heavily disturbed contexts and consequently would be of limited scientific/heritage value.

Impacts identified within the original report are, therefore, still applicable for the proposed amendments. No additional impacts or change in impact significance will result because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments as the environment has not changed.

There is no objection to the proposed amendments. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low.

The Heritage specialist recommend that the chance finds of palaeontological material adopted from the Heritage Western Cape (HWC) Chance Fossils Finds Procedure: June (2016) be added to the EMPR. This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (refer to Heritage motivation report **Appendix C.**

The South African Heritage Resource Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Unit has indicated in writing that they have no objections to the proposed amendments, and that the

recommendations of the specialists are supported and must be adhered to. Further additional specific conditions were provided and are listed in section 5.4.2 above.

5.5. Visual Impacts

The affected project location, as detailed in the original VIA report (MetroGIS (Pty) Ltd - March 2012), remains intact based on the findings of the Visual Impact Assessment (VIA) conducted in 2022. The projected development site's land use has not changed, no new developments have been built on or near the site, and the land use zonation (mining) has not changed. When satellite photographs from 2012 are compared to satellite images from 2022, it is clear that no material changes have occurred on the project site or the surroundings since the initial visual impact assessment examination in 2012.

The visual impact assessment conducted as part of this amendment application (refer to **Appendix E)** concludes that the proposed amendment to the project infrastructure and the extension of validity of the EA is not expected to significantly alter the influence of the PV facility on areas of higher viewer incidence (observers traveling along the roads within the region) or potential sensitive visual receptors (residents of homesteads in closer proximity to the facility).

Therefore, the proposed amendments to the project infrastructure and extension of the EA validity are consequently not expected to significantly influence the anticipated visual impact, as stated in the original VIA report (i.e., the visual impact is expected to occur regardless of the amendment). This statement specifically relates to the assessment of the visual impact within a 3km radius of the proposed PV facility structures (potentially *moderate* negative significance), but also generally applies to potentially low negative visual impacts at distances of up to 6km from the structures.

The VIA Specialist has concluded that the proposed amendment can be supported because the proposed project infrastructure amendment and extension of the EA validity will require no changes to the significance rating within the original VIA report that was used to inform the approved Environmental Impact Assessment (EIA) Report in 2012 (refer to VIA 2012 and 2022 specialist reports). There are no additional mitigation measures necessary. It is reiterated that the Applicant must follow the mitigation measures outlined in the original VIA report from 2012, as well as the conditions and recommendations outlined in the original EA and the approved Environmental Management Programme (EMPr).

5.5.1. Cumulative Assessment

No additional cumulative visual impacts were identified by the specialist as a result of the proposed amendments. Therefore, the impacts identified by the Visual Impact Assessment (MetroGIS Pty– Ltd - March 2012) remain unchanged and would be applicable to the proposed amendments. It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low.

5.5.2. Conclusion

Based on the findings of the Visual Specialist when assessing the current situation on the project site as compared to the initial EIA that was undertaken in 2012, it is concluded that the affected environment has

not changed since the EIA undertaken for the project, and the proposed amendments have no additional impacts and no new mitigation measures are required. The VIA specialist therefore suggests that the amendments to the project infrastructure be supported, subject to the conditions and recommendations as stipulated in the original EA, and according to the Environmental Management Programme (EMPr) and suggested mitigation measures, as provided in the original VIA report.

There is no objection to the proposed amendments. There is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

5.6. Impacts on the Social Environment

The original Social Impact Assessment (SIA), undertaken in March 2012 by Integrated Rural and Urban Development Enterprise (Pty) Ltd, was based on Statistics South Africa's Census 2001 data. Current data available from Stats SA is based on Census 2011, with various updates that are applicable at various levels, such as the Mid-year Population Estimates released on 19th July 2021, and Quarterly Labour Force Survey Quarter 4: 2021, released on 29 March 2022. Notwithstanding this, however, and considering the environment in which the project is situated being on what was property used for mining, which is surrounded by mine dumps, it is unlikely that the social baseline would be significantly differ to that assessed in the original Social Impact Assessment to the extent that it would significantly change the impacts identified during that study.

As there is no adjustment to the development footprint and change in the solar PV panels height from what was authorised, and also that there is no material change in the social environment of the area, there are not any additional negative significant change in the impacts assessment in the original Social Impact Assessment and/or any changes in the assessment of these impacts.

However, the proposed amendments will have a significant social benefit for the following reasons:

- The addition of a BESS will increase the stability of the supply of electricity of the PV facility, providing operating reserve and frequency control to minimise the chance of power outages. The increased security of supply will carry socio-economic benefits on both an individual and business level.
- The extension of the validity of the Environmental Authorisation will increase the likelihood that the project will materialise. Construction of the project will be a positive for the social environment, which has been impacted by the downturn in mining activity.
- The site is one of the anchor projects within the area specifically designated for solar PV projects, as indicated in the City of Matlosana 2021 Spatial Development Plan.
- The City of Matlosana Local Municipality suffers with an unemployment rate of 33%, and 16% of households have no income. The socio-economic status of the Municipality would benefit from any and all opportunity for the creation of employment, opportunities for contractors in the Matlosana region, ownership opportunities for local communities, skills, supplier and enterprise development spend and the implementation of socio-economic development initiatives.

5.6.1. Cumulative Assessment

No additional negative cumulative social impacts were identified by the specialist as a result of the proposed amendments. Therefore, the impacts identified in the Social Impact Assessment report by

Terblanche (2012) remain unchanged and would be applicable for the proposed amendments. However, on a positive basis, with the 250MW being made available, there would be a cumulative benefit associated with the project.

5.6.2. Conclusion

Based on the nature of the proposed amendments for the Vaal River Solar 3 PV Facility, the local social environment, the increase in the contracted capacity of the solar PV facility to 250MW, and the proposed BESS within the property and development footprint which was fully assessed as part of the SIA (Terblanche, 2012), it can be concluded that the positive effects of the proposed amendments on the social environment will outweigh any negative consequences and that the amendments should be approved.

Impacts identified within the original report are, therefore, still applicable for the proposed amendments. No additional impacts or change in impact significance will result because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments as the environment has not materially changed.

There is no objection to the proposed amendments. There are only advantages to the social environment through the development of the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.

It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded largely as positive.

5.7. Overall cumulative impacts

Based on the overall assessments of the surrounding environment in relation to the proposed amendment, the Ecological, Heritage, Soil and Agricultural Potential, Social and Visual specialists did not identify any additional cumulative impacts associated with the proposed amendments.

It was noted that all the original impacts assessments done as part of the EIA process are still applicable due to the fact that there is no change in the baseline environment of the project site for the Vaal River Solar 3 Facility. Also, given the nature of the project and the proposed amendment, there are not any new impacts than what was initially identified, as these amendments will take place within the authorised development footprint.

It was found that all the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low or positive in nature. The project site is located within the Klerksdorp REDZ, which was specifically detailed as a REDZ for the deployment of PV on mining land and to assist in South Africa's Just Energy Transition. The area was considered favourable by DFFE through their SEA process of defining the REDZ areas. No projects are yet preferred bidder or constructed.

The Vaal River Solar 3 project has been identified as a priority project in the City of Matlosana 2021 Spatial Development Plan. The site is one of the anchor projects within the area specifically designated for solar PV

projects, and is included in the Urban Spatial proposal for the Klerksdorp/Orkney/Stilfontein area (refer to **Appendix G.**

6. CONCLUSION AND MOTIVATION FOR APPROVAL OF THE REQUESTED AMENDMENTS

The Vaal River Solar 3 PV Facility project initially commenced in 2011 as part of an initiative by the Landowner, AngloGold Ashanti Ltd (AGA) to investigate alternative land uses for mining land that has low agricultural potential and could stimulate economic development in an area that has seen a large decline in gold mining activity over the last 20 years. The downscaling has resulted in nearly 80% of jobs in the Vaal River gold mining sector being lost between 1996 and 2016 and seen the doubling of the number of people living in poverty between 2000 and 2021.

While the Vaal River Solar 3 PV Facility landowner has changed from AGA to Moab Harmony Gold Mining (Pty) Ltd (Harmony), it is land that is located within the company mining area. The land has not be used for any commercial activity over the last 10 years, is of low agricultural potential and because of its location in a dolomitic area, unsuitable for any irrigated farming.

Klerksdorp was declared as a Renewable Energy Development Zone (REDZ) as part of Phase 2 of the Strategic Environmental Assessment (SEA) process undertaken in 2017. REDZ selection of both Klerksdorp and Emalahleni were done so with the specific outcome "*to identify REDZs in previously mined areas to enable the rehabilitation of abandoned mines and to contribute towards the planning of the Just Energy Transition framework by strategically planning large scale wind and solar PV developments in areas where job losses may occur from closure of mines such as coal, diamond and gold mines*".

South Africa is facing a "perfect storm" of chronic load shedding and constraints in the Eskom transmission grid in the Northern Cape where a large number of construction-ready projects have already been stranded from participating in future procurement rounds. There is a clear acceptance by Eskom, business and many in Government that there is an electricity gap of at least 6GW which if dealt with using renewable energy will require some 15GW of wind and solar PV supported by 3,5GW of battery storage to be deployed over the next 3 years in the parts of the grid that has connection capacity. Vaal River Solar 3 PV Facility is located outside of the Northern Cape grid constraint and located close to Eskom's Hermes Main Transmission Substation and is therefore a project that can contribute to the reduction of load shedding – the project is essentially construction-ready.

The requested amendments include:

- An increase of total generation capacity of the facility from 100MW to 250MW, with no adjustment in the PV panel height or development footprint,
- Inclusion of a Battery Energy Storage System (BESS) into the project description of the EA, and
- An extension of the commencement period (validity) of the Environmental Authorisation.

The following are the key motivating factors which indicate the advantages to granting the requested amendments:

1. The Vaal River Solar 3 PV Facility project is located within the Klerksdorp REDZ on degraded mining land that is encouraged to be used for the development, construction and operation of a solar PV generation facility.

2. Impacts identified within the original report are still applicable for the proposed amendments. No additional impacts or change in impact significance will result because of the amendments, and no additional mitigation measures are required as a result of the proposed amendments as the environment has not changed.
3. All the potential cumulative impacts associated with the Vaal River Solar 2 PV Facility planned within the area (30km radius) can be regarded as Low or positive.
4. There is no objection to the proposed amendments by any of the specialist consultants who have completed a site verification assessment. It is stated that there is no disadvantage to developing the project on this site considering the results of the site verification assessment, and the request to extend the commencement period should be granted by the Department.
5. No objection has been received from any stakeholder or I&APs regarding the project.
6. All the potential cumulative impacts associated with the Vaal River Solar 3 PV Facility planned within the area (30km radius) can be regarded as Low or positive.
7. The Vaal River Solar 3 project has been identified as a priority project in the City of Matlosana 2021 Spatial Development Plan. The site is one of the anchor projects within the area specifically designated for solar PV projects, and is included in the Urban Spatial proposal for the Klerksdorp/Orkney/Stilfontein area (refer to Appendix G.
8. The Vaal River Solar 3 PV Facility has the ability to create employment, opportunities for contractors in the Matlosana region, ownership opportunities for local communities, skills, supplier and enterprise development spend and the implementation of socioeconomic development initiatives.
9. Green infrastructure makes a contribution to the just energy transition.
10. Construction of the project will be a positive for the social environment, which has been impacted by the down-turn in mining activity.
11. The implementation of a ZAR 900,000,000 green infrastructure project, which at least 60% would be spent within South Africa and contribute to meeting South Africa's National Determined Contributions is supported in this area.

Based on the nature of the requested amendments for Vaal River Solar 3 PV Facility, the specialist findings following the site verification assessments, confirmed:

- that the environment has not materially changed since the undertaking of the EIA in 2012,
- that the impact ratings as provided in the initial assessment remains valid, and
- that the mitigation measures provided in the initial assessment are still applicable. It can be concluded that the requested amendments will not lead to any additional impacts other than those identified and assessed within the EIA of 2012.

In terms of the impacts identified in the EIA relating to ecology, soil and agricultural potential, heritage (including palaeontology), visual and social aspects, it was concluded that the proposed amendments will not increase the significance of the impacts originally identified and assessed in the EIA, or lead to any additional impacts that cannot be mitigated to a low significance following the implementation of the mitigation measures as recommended in the initial studies, the EMPr and the Environmental Authorisation.

It is therefore concluded that:

- The proposed amendments do not constitute a listed activity.
- The impact ratings as provided in the initial assessment remains valid.
- The mitigation measures recommended in the EIA are still applicable and adequate to manage the expected impacts as a result of the proposed amendments.

Therefore, taking into consideration the conclusions from the specialist site verification and motivation reports (**Appendix A – E**) 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 EIA as well as the Environmental Management Programme (EMPr) for Vaal River Solar 3 PV Facility Project.

Additional mitigation measures are which are to be included in the EA, should the request to extend the commencement period be granted by the Department, are specified to meet SAHRA's current requirements in terms of section 38(8) of the NHRA, and also to ensure adequate mitigation considering the project's position with a REDZ area, and management measures for the operation of the BESS from a technical perspective.

The additional mitigation measures to be included in the EA include the following, and can be integrated into the EMPr when submitted for approval by DFFE:

- The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas.
- An open space management plan should be developed for the site, which should include management of biodiversity within the fenced area, as well as that in the adjacent rangeland.
- The introduction of artificial passageways underneath boundary fences for the safe passage of mammals between the development area and surrounding areas.
- Preconstruction walk-through of the final development footprint for protected species that would be affected and that can be translocated under the supervision of the ECO and/or Contractor's Environmental Officer (EO).
- The inclusion of a Chance Finds Procedure to the EMPr.
- Archaeological and Palaeontological walkdowns must be undertaken for the final layout prior construction.
- Findings or any evidence of archaeological sites or remains are to be reported to SAHRA for inspection by appropriate specialist/s and may be subject to permits issued by SAHRA.

7. PUBLIC PARTICIPATION

A public participation process has been conducted in support of the Amendment Application to amend the Environmental Authorisation (Ref: 12/12/20/2513/3) issued for Vaal River Solar 3 PV Facility. The Public Participation has been undertaken in accordance with the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended. The following key public participation tasks have been undertaken:

- The database/register of I&APs has been updated and maintained.
- Placement of site notices at the site on **04 July 2022** (refer to **Appendix F4**).
- Written notifications to registered I&APs as well as Organs of State regarding the availability of the Motivation Report were distributed on **05 July 2022** (refer to **Appendix F2** and **Appendix F3**).
- Placement of an advertisement in the Midweek Newspaper on **05 July 2022** announcing the availability of the Site Verification and Motivation Report for a 30-day review and comment period.
- The Draft Site Verification and Motivation Report was made available for the 30-day review and comment period from **05 July** to **03 August 2022** on the Savannah Environmental website: https://savannahsa.com/public-documents/. CD copies were available on request from the project team.

Comments received during the 30-day review and comment period are included as **Appendix F5** in this submission of the Final Site Verification and Motivation Report to the DFFE for consideration in the decision-making process. Comments are included and responded to in a Comments and Responses Report, included as **Appendix F6** of this Final Motivation Report. Proof of attempts made to obtain comments from relevant Organs of State and key stakeholders are included in **Appendix F2 and Appendix F3** of this Final Site Verification and Motivation Report.