



FINAL BASIC ASSESSMENT REPORT

FOR

**THE PROPOSED SOLAR
PHOTOVOLTAIC (PV) POWER
GENERATION FACILITY AT THE ESKOM
GROOTVLEI POWER STATION,
MPUMALANGA PROVINCE**

EIMS REF: 0940

DEA REF: 14/12/16/3/3/1/669

28 JANUARY 2014



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BASIC ASSESSMENT REPORT

DOCUMENT CONTROL

Solar Photovoltaic (PV) power generation facility at the Eskom Grootvlei Power Station
Basic Assessment Report

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REVISION AND AMENDMENTS

DATE	No.	DESCRIPTION OF REVISION OR AMENDMENT
2013-12-05	0	Draft Basic Assessment Report for Public Review
2014-01-28	1	Final Basic Assessment Report

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BASIC ASSESSMENT REPORT



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

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Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 September 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

BASIC ASSESSMENT REPORT

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? [REDACTED] NO ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

1. Introduction

Eskom Holdings SoC Limited (Eskom) proposes to construct and operate a Solar Photovoltaic (PV) facility with a capacity of less than 20MW at the existing Eskom Grootvlei Power Station, in Mpumalanga. This additional electricity generated will result in this additional amount being made available for the Grid). Eskom as an entity, is in the business of electricity Generation and Transmission related activities. It is also mandated to distribute electrical power throughout South Africa. Eskom has long recognised renewable energy as one of the sustainable options for generating cleaner (low carbon) electricity. Solar photo-voltaic (PV) is one such renewable option. In 2011/2012 Eskom constructed pilot Solar PV plants for their own consumption at Kendal Power Station (620 kWp solar PV plant) and Lethabo Power Station (575 kWp solar PV plant) as well as their office in Sunninghill, Megawatt Park (400 kWp PV panels on parking canopies as well as a 24kWp concentrating PV plant). Eskom proposes to further roll out additional 120 -150 MWp of PV plants within the next few years in order to further diversify Eskom's energy mix (which comprises of wind energy facilities, solar, Hydro-schemes, pumped storage schemes, a nuclear power station and coal-fired power stations, across the country) to reduce Eskom's carbon footprint and to support the demand side management energy efficiency programme.

Eskom will appoint a contractor on an output specification contract, thus the contractor will be provided with a set of minimum specifications to comply with, including the technical details supplied in the contractor proposal. Thus the costing and detailed design of the PV facility will be provided by the contractors, and the successful bidder will construct their proposed design. This BAR has taken this consideration into account, since contractors have their choice on panel type and size, with the three foundation options at their disposal. Thus there should be no new impacts over and above those that are included in this BAR, created by the contractors' choice. This BAR/EMPr thus focuses on result driven mitigation measures and objectives, which provides enough freedom for the contractor's technical selection/design, while still forcing contractors to take cognisance and comply with the required mitigation measures in the EMPr.

2. Project Description & Background

The proposed project will involve the construction and operation of a solar PV facility, with supporting infrastructure such as power lines and connection points and will produce a total generation capacity of not more than 20MW, occupying a total footprint of approximately 17 ha. In terms of the EIA Regulations published in Government Notice R543 of 2 August 2010 in terms of Section 24 (5) of the National Environmental Management Act (Act No. 107 of 1998), certain listed activities as set out in Government Notice 1, GN R544 require environmental authorisation, through a Basic Assessment (BA) process, before they can proceed.

A decision was made by Eskom, on recommendation by the Environmental Assessment Practitioner, to utilise Alternative site #1 (refer to description of site alternatives provided in Section A2) for the proposed solar PV facility, since it had the least sensitive environmental constraints as identified during the specialists investigations. This decision was motivated due to the historically impacted and degraded nature of Alternative site #1, compared to the other three identified potential alternative sites, which were not recommended either due to wetlands (Figure 1) or due to insufficient size.

Alternative site #1 is located within the south eastern portion of the Grootvlei power station property and is approximately 17ha in size. It contains the most degraded secondary vegetation (approx. 10ha), of all the assessed alternatives, and includes the historically rehabilitated ash disposal facility (ADF) (approx. 7ha). This old ash disposal facility was historically utilised by the power station and ceased usage in the 1970's. The rehabilitation of this site consisted of the placement of topsoil, and planting of indigenous vegetation. The remaining approximately 10Ha of land for the proposed PV facility is land adjacent to the existing old ash disposal facility (Alternative site 1 as shown in Figure 2 & Figure 3). All specialist studies (ecological, heritage, visual, geotechnical, soil and agricultural potential) conducted as part of the basic assessment concluded that Alternative site #1 (17ha) was the preferred alternative compared to the other three alternative sites, provided that as much of the platform of the old ADF (comprising 7ha) was utilised. The placement of a portion of the proposed PV facility on the ADF would have positive impacts to the environment, since it would assist greatly in: (1) utilising the currently sterile rehabilitated ADF, as opposed to disturbing virgin greenfield land; and (2) improving potential future pollution through reduction of the ADF rain water infiltration. This principle is in line with optimal utilisation of disturbed lands.



Figure 1: Wetlands on site, Alternative site #2. Grootvlei power station visible in the background



Figure 2: Rehabilitated old ash disposal facility in the background on Alternative site #1. Secondary grassland is visible in the foreground.

2.1 Power line traversing a watercourse

It is confirmed that there will be a requirement to obtain a Water Use Licence for impeding and diverting the flow in a water course, for the proposed power line that will connect the PV facility to the power station connection point. As stated previously, the Grootvlei Power Station property contains degraded wetlands (Refer to the Ecological report in Appendix D). The power line will require a Water Use Licence (WUL) for altering the beds and bank of a water course (the wetlands found on site). The WUL will be applied for in addition to the NEMA authorisation process, and the relevant documents will be submitted to DWA for approval. The Final Basic Assessment Report (BA) will also be submitted to DWA, for consideration in the relevant Section 21 Water Use Licence applications. A DWA pre-application meeting was held at the Pretoria Head office, on the 15th of April 2013, which outlined these requirements. The Minutes have been included in Appendix E.

Two feasible alternative power line route layouts were assessed as part of the BAR (Figure 30 in Appendix A). Assessed corridors of 15m in width were created on either side of the proposed centre line of the power line and were assessed by the wetland specialist and hydrogeologist. Refer to Appendix D for the specialist studies. The recommended routes and mitigation measures minimised the impact on wetlands by following existing road, rail and power line servitudes.

3. Legal Requirement for the placement of a portion of the proposed solar PV facility on an ADF.

The usage of Alternative Site #1 had some legal uncertainties from an Environmental Authorisation perspective in terms of the need to authorise the closure of the already closed and rehabilitated ash disposal facility (prior to the placement of a portion of the PV facility). Eskom subsequently obtained a legal opinion to determine the requirement for closure and decommissioning of the old Ash Disposal Facility in terms of the NEMA and NEMWA definitions. It was concluded that as the old ash disposal facility ceased usage (rehabilitated and not in active service) in the early 1970's, and there is no intention to commence with a listed activity with regards to its current status, there is no need to acquire an authorisation/ Waste Management Licence (WML). This opinion (the need to obtain a WML) was confirmed by the Department of Environmental Affairs (DEA) licencing section (attached as Appendix J-3&4). This BAR therefore will not assess any activities or impacts linked to decommissioning or closure of the ADF, in so far as such does not directly pertain to the construction and operation of the PV Facility. Eskom and the EAP felt it prudent to assess the impact that the PV facility could have going forward on the ADF.

The ADF has been a long term historical feature. The ADF ceased operation in the 1970s, and as such was rehabilitated as per the Eskom rehabilitation plans of the day (i.e. placement of top soil on the facility, and the planting of indigenous vegetation). The utilisation of the ADF (i.e. ~7ha of the ~17ha Solar PV Site to be located on the ADF) for a portion of the PV facility footprint is anticipated to be an improvement on the status quo of the environment, through avoiding impacting on further new environment/land. It is further the understanding of the EAP and the Hydrogeological specialist that utilising the ADF for a portion of the PV footprint is more beneficial to the environment since it avoids utilisation of new land, but re-uses disturbed land. The hydrogeological specialist found that if the entire PV facility is designed such that potential rain water infiltration is reduced, it would also have a positive impact on the potential ground water contamination that can result in the future. It should also be noted that at present there are sections of the surface of the ADF which are compacted therefore there is a portion of rain water which does not infiltrate into the ADF.

5. Site selection & PV facility design

The following section briefly describes the location and components that together make up the proposed PV facility.

PV operates by direct conversion of light into electricity at the atomic level. The plant and associated infrastructure is made up the following components:

1. PV Cell - A basic photovoltaic device, which generates electricity when exposed to solar radiation. All photovoltaic cells produce DC electricity.
2. PV Module or Panel - The smallest complete assembly of interconnected photovoltaic cells. In the case of crystalline silicon cells, the cells are connected and compressed between a transparent layer and a backing material. The modules are typically mounted in a lightweight aluminium frame. Panels will be spaced ~4m apart. (~Panel dimensions 1640mm / 992mm / 50mm, total area 1.63m²), the final panel type chosen may be slightly smaller.
3. Photovoltaic Array - An interconnected system of PV modules that function as a single electricity-producing unit. The modules are attached to a steel/aluminium mounting structure that is either piled to the ground or has concrete slabs supporting it. The PV array will occupy around 16 ha.
4. String of modules – Number of PV panels connected in series. In this case, several strings will connect to a single inverter.
5. Connection to combiner boxes - The electricity generated from the solar panels will be transferred via combiner boxes to the inverters. These combiner boxes combine the several cables that come from each string of modules into a unique pair of DC cables that is then connected to the inverter.
6. Wiring to Central Inverters/Transformers - Array enclosures are wired to central inverters, where DC is converted to AC. The central inverters function to convert DC electricity to AC electricity at grid frequency. The voltage is then stepped-up via transformers to be then distributed via the power station grid.
7. Connection to the Grid - A substation is required to combine all the AC cables coming from the several transformers making use of switching station. The substation (around 100m² in size) will be constructed to Eskom specification. The 6.6kV lines are typically 10-13m high. A 6.6kV power line will be constructed according to Eskom specification that will transmit the power generated from the PV plant to the Grootvlei power station grid. It is only the powerlines and their associated construction that impact on wetlands. It is important to note that the final design will be determined by the approved bidder. For the purposes of assessing environmental impacts a generic description would be suitable to determine order of magnitude of the relevant impacts.

Four possible alternatives sites were identified by Eskom for the proposed PV facility within the Grootvlei Power Station property. As part of the Basic Assessment, the sites were subjected to ecological, heritage, visual, geotechnical, soil and agricultural potential specialist studies to determine and locate any potential fatal flaws, identification of impacts and mitigation measures on the site. Please refer to Figure 3 for a map showing all the initially proposed technically feasible site alternatives numbered 1 - 4. Based on the outcomes of the specialist studies, and the recommendation from the EAP, only Alternative site #1 was deemed technically feasible, and assessed further in the BAR.

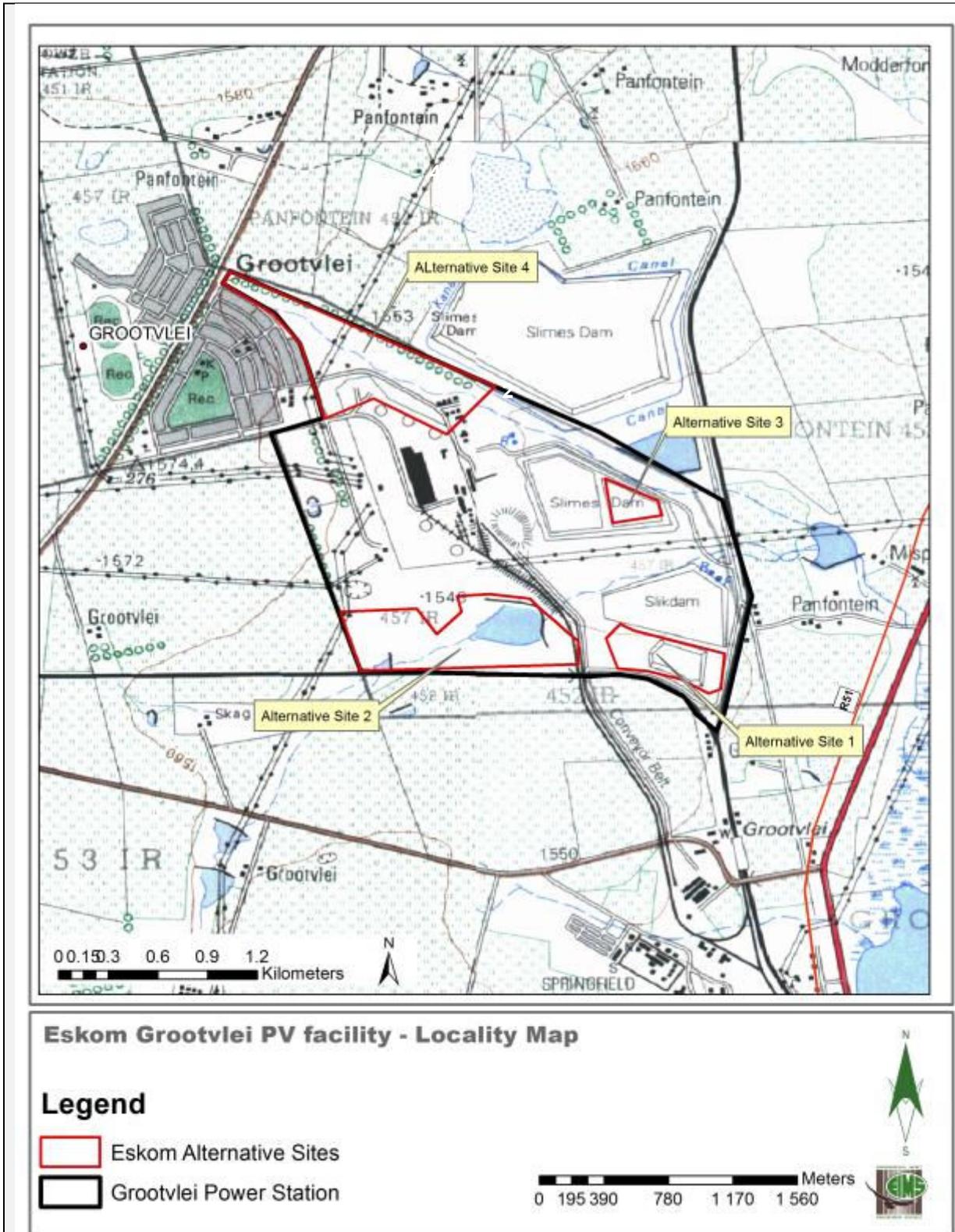


Figure 3: Google earth image showing the broader study area and the four proposed alternative sites.

Placement of the portion of the PV facility on the platform of the ADF:

Alternative 1 comprises a ~17ha PV Solar facility, ~7ha of which will be located on the ADF and the remainder on a portion of vacant land adjacent to the ADF. In order to understand what impact the proposed PV facility would have on the receiving environment, a Hydrogeological assessment was conducted to investigate Alternative site 1 and how this proposed site interacts with the existing hydrogeological system. The study identified that historical groundwater pollution had taken place, possibly due to ADF activities. The findings indicated that by reducing the potential for leaching of the

ADF, potential future pollution of the site can indirectly be minimised.

It should be noted however that any improvement in the impermeability of the ADF would have a positive improvement in the status quo in terms of groundwater. The design engineers (ARUP SA) proposed a conceptual design whereby 45 percent of rain water that currently could fall on the ADF would be captured and not fall onto the ADF due to the proposed PV panels covering 45% of the ADF. This potential reduction of rain water falling directly onto the ADF would thus reduce the amount of rainwater that could potentially infiltrate the ADF. The proposed rain water management system (described further below) proposed by ARUP would thus have a positive impact (by inter alia reducing any possible disturbance to the surface of the ADF) when compared to the current status. A portion of the proposed PV facility located on top of the ADF would be a beneficial end use of the old ADF, while promoting renewable energy.

The PV facility will also have a footprint located adjacent to the ADF, on the remaining 10ha as part of the system. The panels to the west of the ADF will be connected to the ADF section through transformers and a substation to connect to the Powerstation via one of the preferred powerline routes (Route D or F). It is proposed that the PV facility on the ADF will include a "rain water catchment system" (refer to Section 5.2) that would collect precipitation falling on the PV facility located on the ADF. Any additional storm water management mitigations from the DWA from/as part of the WUL process and WUL consultation will be incorporated. Eskom must ensure that the receiving environment is not contaminated by storm water, if it is deemed polluted.

The surface portion of the cabling and trenching on the ADF would be incorporated into the Rain Water Catchment system to reduce erosion and potential water infiltration and consequent preferential pollution pathways. This would reduce any possible impact associated with disturbing the ash layer.

The principle of the rain water management system will be to construct concrete drains to capture any rain that falls onto the arrays, which will be channelled and discharged through suitably designed energy dissipation structures, into the existing natural drainage lines of the old ash disposal facility platform (refer to Figure 4, 5, and 6). The energy dissipation structure is designed to reduce the storm water's velocity by obstructing the water flow which prevents erosion and allows the water to flow into the natural drainage lines at a lower velocity. Section 5.2 further describes the proposed rain water catchment system.

5.1 Construction Phase

Activities that will be undertaken during the proposed PV facility construction that will affect portions of the ADF will include:

- Stripping and subsequent stockpiling or spreading of topsoil, where needed;
- The construction of a power line to connect the PV facility to the power station. Spans would normally be approximately 100m as worst case scenario spacing between each pylon. Steel monopole pylons will be provided with reinforced concrete bases, with volumetric dimensions of approx. 1m (w) x 1m (l) x 2m (d); and
- Vegetation clearance in relevant area (less than 17 ha)
- Construction of a "rain water management system" to control the potential increased run-off coefficients from the PV facility placement on the ADF. A rain water management system will not be designed for the remaining portion of the PV facility on the land adjacent to the ADF.
- Limited and controlled excavation of the ADF, specifically where piling and foundation strengthening is required.
- The rain water catchment system will capture. DWA requirements relating to stormwater management that could result from the consultation as part WULA process do not form part of the scope of the BAR and will be addressed separately during the WULA process and integrated post EA.
- Trenching (40cm x 50cm) within the PV facility footprint, to accommodate internal wiring for the PV facility. Trenching will be sealed by the Rain Water Management system foundation, to avoid disturbing the ADF surface.
- Eskom will outsource the construction and select the suitable bidder that will comply with the proposed construction methodology. Due to this fact, Eskom would like to leave the foundation option of the PV panels open to selection. The different foundation options include concrete pad, piles or ballast foundations. As stated above, the foundations will be sealed by the Rain Water Management system to eliminate any ground water infiltration on the ADF. The use of different foundation options will not impact on the impermeability of the ADF, since the Rain Water catchment system covered is maximised by the PV panel surface area and is not dependant on the underlying foundation of the PV arrays. The EMPr will deal with each foundation option separately and in detail, to ensure adequate mitigation measures are applied during construction.

Eskom will require additional supporting and ancillary infrastructure to be constructed inside the ~ 17 ha PV footprint, to assist with operation of the PV facility. This would include:

- A control facility to monitor and control the facilities - building within a footprint of less than 100m² (within the ~17 ha footprint); electrical switchgear, control equipment (basic services such as water and lights included);
- Voltage and current regulators;

- ☞ Protection circuitry;
- ☞ Possible requirement of control room and housing for transformers (less than 170m² within the ~17 ha footprint); and;
- ☞ Servitude for interconnection power line from PV plant to interconnection point.

5.2 Rain Water Catchment system conceptual design

According to ARUP the following assumptions and limitations were included in the proposed rain water management system:

- It is believed the rain falling onto the PV arrays is pure water;
- The rain water falling onto the PV arrays will not infiltrate the closed ash disposal facility (due to the proposed placement of concrete lined drains);
- If the rain water does come into contact with any particulates it will not differ to the way the system operated previously. Note the old ash facility has been rehabilitated by means of the placement of an approximate 30cm layer of top soil, followed by the planting of indigenous vegetation.

It is proposed to channel the rain water that falls on the arrays through lined drains, to the already existing natural drainage system that has been in existence over the past 40 years around this old ADF platform on the North edge. The old ADF platform appears to drain from South to North with a 2m cross fall of approximate grade 1: 100. This is based on Google earth measurements. This grade is suitable for effective drainage and will be the basis for the drain sizing of the proposed primary drains. Sizing of the drains will therefore be reliant on slope, rainfall intensity and channel lining. These factors will be considered when using the relevant best practice guidelines and other relevant codes designing the storm water channels. To ensure no potential infiltration of rain water (that would fall onto the solar PV arrays, and subsequently into the drains/channels) into the ADF and no potential erosion of the ADF, the channels will be constructed out of steel mesh and concrete. It is proposed that the arrays will cover approximately 45% of the exposed surface area of the old ash disposal facility. The principle of the drainage will be to construct lateral secondary concrete lined collector 'V' drains (Figure 5) running East - West and West – East to the proposed primary South – North concrete lines 'V' drains which discharge through suitably designed energy dissipation structures, into the existing natural drainage lines of the old ash disposal facility platform, which have developed over the past approximately 40 years (i.e. since the old ADF ceased usage and was closed), see Figure 6. The energy dissipation structure is designed to reduce the storm water's velocity by obstructing the water flow which prevents potential erosion and allows the water to flow into the natural drainage lines at a lower velocity.

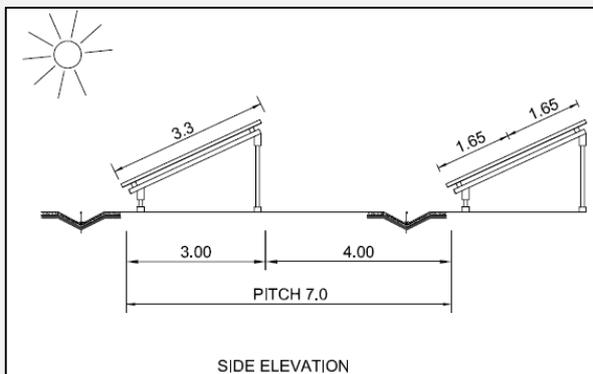


Figure 4: Side elevation of the proposed rain water management system

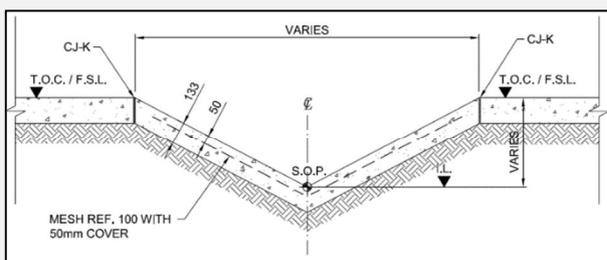


Figure 5: Side elevation of the lined drains running from East/West

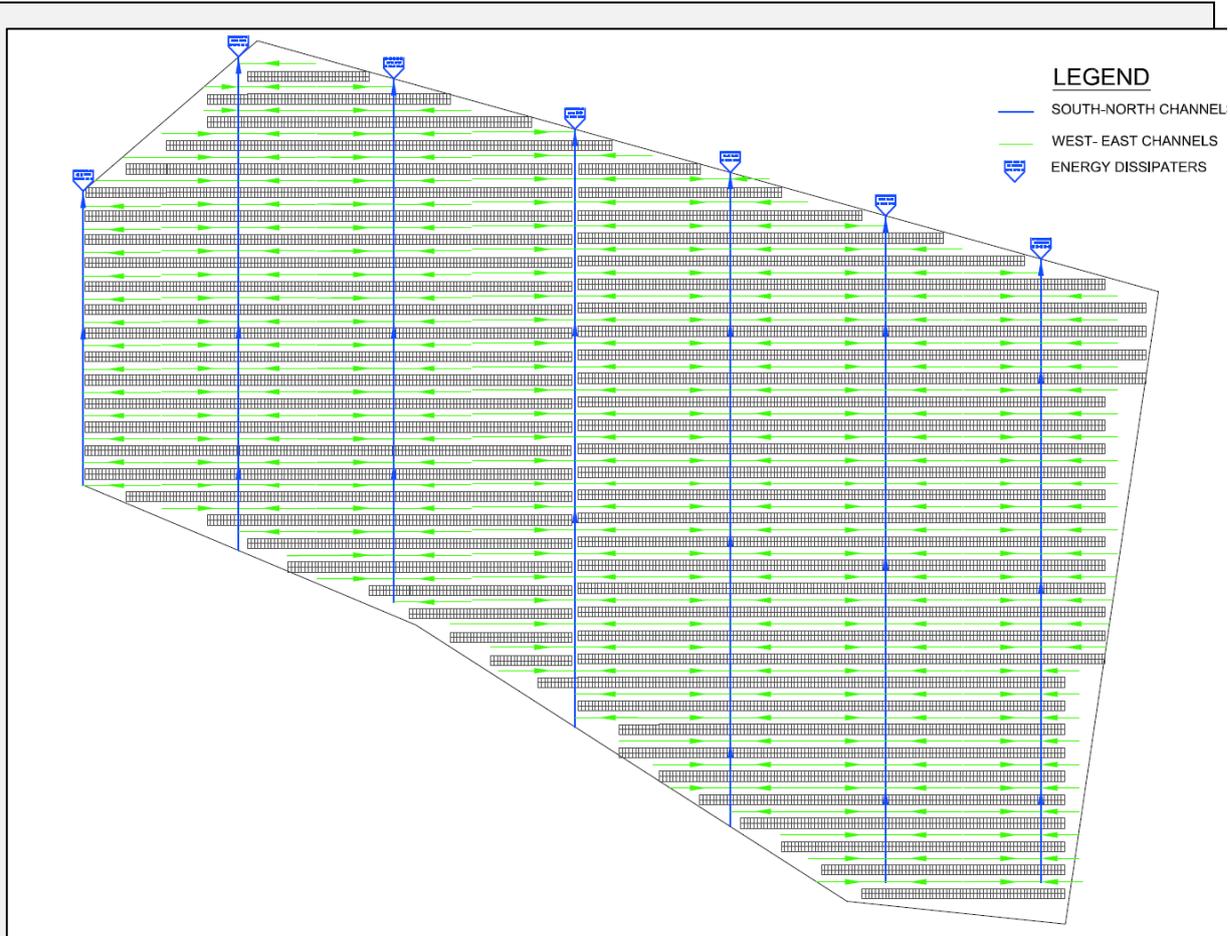


Figure 6- Drainage proposed for the proposed PV array on the old ADF at Grootvlei Power Station

The design philosophy is that the 45% of the potential runoff will not fall directly onto the old ADF (as 45% of the ADF would be covered by these array), as it is transported down the lined channels. The drains will also assist in reducing the concentration times of the surface runoff on the old ash disposal facility, further reducing permeation, if permeation does occur. The permeability of the old ash disposal facility is also low due to the lime content which creates a pozzolanic reaction between the lime and the ash which makes up the fly ash which has resulted in hardening (“cementation”) with time.

5.3 Operational Phase

The proposed PV facility is designed to operate continuously (depending on the solar radiation), unattended and with low maintenance for about 25 years. Project maintenance would consist of routine and corrective maintenance on electrical infrastructure, mechanical vegetation control and cleaning of PV modules.

The design engineers have also added measures to the PV facility design (as proposed in the specialist studies) that would reduce potential storm water pollution and potential erosion (from rainfall onto the arrays) to the ADF during the operational phase. Rainwater and subsequent storm water will be managed through the use of channels, berms, and velocity dissipaters into the existing drainage network. Any additional storm water management mitigations from the DWA from/as part of the WUL process and WUL consultation will be incorporated. Eskom must ensure that the receiving environment is not contaminated by storm water, if it is deemed polluted.

A potential source of potential storm water pollution from the PV facility is as a result of the air pollution associated with the power station and other sources (e.g. low level domestic burning etc) that would accumulate on the PV facility footprint and PV panels. Additional storm water management will not form part of the scope of the BAR, since the required mitigation measures have not been determined by DWA, which will come during engagement undertaken during the Water Use Licence application process. Pollution of fugitive emissions on storm water quality has been reduced to some degree by placing the PV facility at a location that is on the upwind of the primary sources, considering the predominant wind direction of the power station (Alternative 1).

BASIC ASSESSMENT REPORT

6. Power line route determination and design

A wetland delineation study was conducted to assist with determining the least environmental impact route for the proposed 6.6 kV power line to connect the PV facility in Alternative site #1, with Grootvlei Power Station. Four alternative routes with a 15m buffer on either side were identified and presented to Eskom. Two feasible power line routes were selected, namely, layout alternative D (1274metres) and F (1214metres) depicted **Error! Reference source not found.** in Appendix A. Route D and F were combined with Alternative site 1, to create Alternative 1 (S1) and Alternative 2 (S2) in the BAR, respectively.

The power line routes have included adequate servitude buffers around railways, roads and existing power lines. The two powerline routes would not have a significant impact on the wetland system if disturbances by construction machinery are minimised. In addition the tower foundations should be as small as possible. It is anticipated that the final pylon location and placement within the corridors would not alter the environmental impact and the significance score, since the majority of the route is classified as temporary wetland and therefore such alternatives are not considered further. No pylons will be placed inside the permanent wetland zone. Provisionally a steel monopole pylon has been proposed as a feasible option. The WUL application will indicate the exact position of the pylons within the Route Corridor assessed in this BAR.

It was determined that steel monopole pylons (with the smallest foundation footprint) would be the best design option to reduce to impact of the powerline on wetlands. The steel pylons would also allow for the maximum line span between pylons. Both the wetland and hydrogeological studies identified the disturbance of wetland soil during construction as the greatest impact on the wetland. The steel pylons (as opposed to gum poles etc) would maximise the distance between pylons and thus reduce the impact on the wetland. Both feasible route layouts follow existing servitudes which will allow contractors to utilise the adjacent roads and rail to erect the pylons and power line. This approach would reduce the actual construction footprint by limiting their movement to existing road and rail infrastructure.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<p>GN R.544 Item 1(i & ii): The construction of facilities or infrastructure for the generation of electricity where:</p> <p>(i) the electricity output is more than 10 megawatts but less than 20 megawatts;</p> <p>(ii) [...]</p>	<p>The proposed project will involve the construction of a Solar Photovoltaic (PV) facility, whereby solar panels will be erected with support structures, with a generation capacity of less than 20MW and will occupy an area greater than 1ha.</p>
<p>GN R.544 Item 24(i): The transformation of undeveloped, vacant or derelict land to –</p> <p>(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; -</p>	<p>The proposed project will occupy a total footprint of just under 17 ha, within the boundary of the Grootvlei Power Station. ~10ha of the site is located on disturbed secondary grassland (not deemed sensitive), while the remaining ~7ha is occupied by the historically existing ADF.</p>
<p>GNR 544 item 11(xi): The construction of infrastructure or structures covering 50 square metres 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.</p>	<p>The proposed power line will be constructed to connect the PV facility to the Grootvlei power station. The line will cross a wetland on the power station property. A water use licence will also be required.</p>
<p>GNR 544 item 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from:</p> <p>(i) a watercourse;</p> <p>(ii) [...]</p>	<p>The proposed power line pylon construction will be placed inside a wetland, the combined soil excavation required for the foundation of the pylons will exceed 5 cubic metres, triggering this listed activity.</p>
<p>GNR 544 item 28: The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a [new,</p>	<p>Following a pre-consultation meeting with the DWA (10 December 2013) it was confirmed that this project will trigger a Water Use licence (WUL) as a result of the power</p>

BASIC ASSESSMENT REPORT

or amendment of, an existing] permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	lines traversing wetlands and for the installation of the PV panels.
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2. FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

The identification of alternatives is a key aspect of the success of the Basic Assessment process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider in this Application. There are however, some constraints that have to be taken into account when identifying alternatives for a project, depending on the scope. Such constraints include financial, social and environment related. Alternatives identified that are relevant to the Eskom Grootvlei PV project area:

- Activity alternatives: not applicable - the PV facility is the desired activity and Eskom is mandated to generate and transmit electrical power. The renewable energy aspect will increase Eskom ability to supply electrical power.
- Process alternatives: not applicable as yet, since the activity does not lend itself to alternative processes.
- Layout Alternatives
 - The Hydrogeological study assessed the impact of the PV facility as a feasible alternative to reduce future groundwater pollution by the proposed PV facility. A rain water catchment system has been proposed to collect a percentage of the rain water falling on the ADF. The assessment is based on a 45% coverage area, the final coverage area is unknown at present and will be provided by the winning bidder. Any increase in cover percentage from the status quo will have a positive effect on potential ground water pollution.
 - An additional layout alternative would have focused on placing the PV facility on the non-ADF portion on Alternative site #1 only. However this alternative was deemed technically unfeasible due to the footprint size requirements for the PV facility.
- Technology alternatives: not assessed, since Eskom would use single axis tracking or static arrays, which have a similar impact. Incremental technology alternatives have been included in the mitigation

BASIC ASSESSMENT REPORT

- and management measures, where applicable.
- Design alternatives: Eskom would use either screwed/rammed piles, concrete pads or ballast foundations for the installation of the PV arrays. The impact of these options would not have differing impacts on the ADF since all foundation options will be sealed to prevent potential water infiltration into the ADF. The rain water management system's efficiency would not be affected by the foundation choice, since it utilises the surface area of the PV panels and trenches to capture rain water to. Each foundation option has specific mitigation measure during the construction phase to ensure potential impacts are minimised.
 - Location alternatives;
 - Four potential technically feasible alternative sites were identified during the planning and design phase. Three of the four sites contained fatal flaws (containing sensitive wetlands or being of insufficient size) and are thus not feasible going forward. Alternative #1 was recommended and assessed further in the assessment.
 - Two power line route options were assessed in the BAR starting from the recommended Alternative #1 site. These alternative are known as Alternative 1(S1) and Alternative 1(S2), representing the feasible site with two route alternatives.
 - The No-Action alternative (No-Go)
 - Will assess the current status quo of the environment. The no-go will be the baseline against which the remaining alternatives, impacts are assessed.

a) Site alternatives

1. Alternative site identification & evaluation process

For any alternative to be considered feasible, it must meet the need and purposes of the development proposal without presenting significantly high associated impacts. In the case of Grootvlei Power Station the major constraints for the identification of location alternatives have been due to the presence of wetlands within the property. Opportunities exist to reduce the potential impact of the proposed solar PV facility further by maximising the positive environmental impact created by utilising the old ADF, and where possible improve the current state of the environment by reducing exposed surfaces and impacting on greenfield sites.

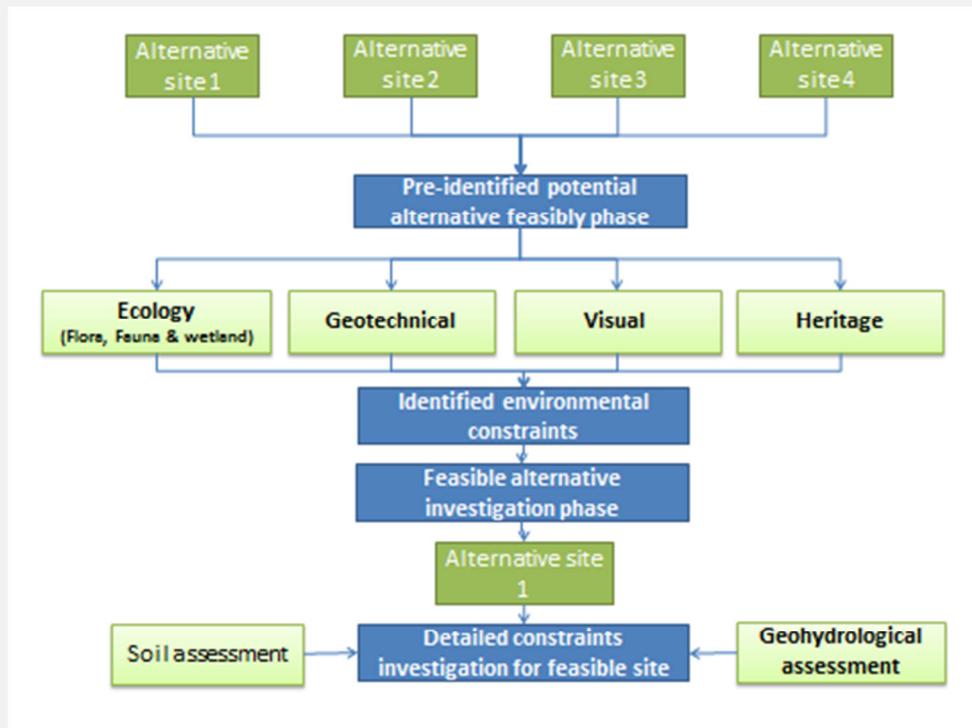


Figure 7: Feasible site selection process undertaken during the BA.

The first phase of the initial planning for the BA process was to assess the suitability of four potential technically feasible alternative sites within the Grootvlei property (pre-identified by Eskom). The potential technically feasible alternatives sites were selected from an Eskom engineering feasibility standpoint and included criteria such as:

BASIC ASSESSMENT REPORT

- Size of the site to accommodate the PV footprint; and
- Proximity to an existing electricity connection point to connect the PV facility to the power station.

The above four potential alternative sites are indicated in Figure 3. The sites were subsequently subjected to environmental screening which included various specialist studies, (as stipulated in the BA application acknowledgment of receipt letter EIA assessment guidelines) in order to determine which of the four pre-identified sites could be considered feasible alternative sites. The specialist studies identified wetlands as fatal flaws, amongst others, present on the Grootvlei property, which meant that only one of the alternative sites would be feasible and carried forward in the Basic Assessment. Through this process, two route alternative layouts were assessed in the BAR.

Specialist ecological, heritage, visual and geotechnical studies were undertaken to get an overview of the study area to inform the Basic Assessment and the site selection process. After this process was completed alternative site #1 was selected as the only feasible alternative. Additional soil and agricultural potential studies and a hydrogeological study were undertaken on Alternative site 1, to focus specifically on this site. Refer to Appendix D for copies of these specialist studies. Table 1 below is a summary list of specialist studies that were undertaken for each site alternative.

Table 1: Specialist studies undertaken at each of the pre-identified potential alternative sites

Pre-identified potential alternative feasibly phase					Feasible alternative investigation phase	
Site alternatives	Ecology study	Geotechnical study	Visual study	Heritage study	Agricultural potential study	Hydrological study
Potential alternative site 1 Grassland and ADF	✓	✓	✓	✓	✓	✓
Potential alternative site 2 Extensive Wetland	✓	✓	✓	✓		
Potential alternative site 3 Small old ADF	✓	✓	✓	✓		
Potential alternative site 4 Extensive Wetland and other sensitivities	✓	✓	✓	✓		

The various types of alternatives considered are presented in the alternative sections below together with an explanation of which alternatives were considered feasible for comparative assessment in this Basic Assessment. The assessment determined that Site alternative 1 was the most preferred (feasible) alternative. The remaining three alternative sites, (sites 2 – 4) were deemed unfeasible and will not be assessed further than the alternative feasibility section in the BAR.

EIMS through the various specialist assessments and their recommendations identified and recommended a potential location (preferred alternative) for the proposed PV facility. The preferred site was identified by considering the following:

- The minimum size requirement of the proposed PV plant;
- The ecological state of the receiving environment;
- The presence of wetlands in the study area;
- Archaeological sensitive areas;
- Visual impacts; and
- Geotechnical limitations.

BASIC ASSESSMENT REPORT

Table 2 below outlines the sensitive features that were found onsite by the various specialist studies from Table 1. The site ranking is based on the number of sensitive features found. It is clear from the table that alternative site #1 is the feasible (least environmentally sensitive) alternative.

Table 2: Alternative sensitivity constraints (summary).

Constraints investigation for alternative sites						Site sensitivity ranking
Site alternatives	Soil and agricultural potential	Sensitive Wetlands	Heritage sensitivity	Sensitive vegetation	Ground water sensitivities	
Potential alternative site 1 grassland and ADF	Negligible sensitivity	No wetlands on alternative	Negligible sensitivity	Low sensitivity	Negligible sensitivity	Low sensitivity (feasible & preferred alternative)
Potential alternative site 2 Extensive Wetland	Not assessed (site was fatally flawed by wetland)	High sensitivity	Negligible sensitivity	High sensitivity	Not assessed (site was fatally flawed)	Medium sensitivity (unfeasible alternative- presence of wetlands)
Potential alternative site 3 Small old ADF	Not assessed (site was fatally flawed by technical requirement)	No wetlands on alternative	Negligible sensitivity	No vegetation found on site	Not assessed (site was fatally flawed)	Medium sensitivity (unfeasible alternative – insufficient site size)
Potential alternative site 4 Extensive Wetland and other sensitivities	Not assessed (site was fatally flawed by wetland)	High sensitivity	Medium Sensitivity	High sensitivity	Not assessed (site was fatally flawed)	High sensitivity (unfeasible alternative- presence of wetland)

Alternative site 1 (environmentally preferred & feasible alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Site alternative 1 is the environmentally preferred feasible site alternative for the following reasons: It consists of ~17Ha: ~7Ha of the old ADF platform and ~10Ha of land adjacent to the ADF <ul style="list-style-type: none"> ☞ It consists of secondary grasslands and therefore biodiversity constraints are fairly low; ☞ The site is large enough to accommodate the PV plant, if the existing old rehabilitated ADF, that is not in service, is utilised; ☞ The soil is fairly sandy so drainage will not be impeded significantly 	26° 46.705'S	28° 30.478'E

BASIC ASSESSMENT REPORT

<p>due to the hard surfaces of the PV panels;</p> <ul style="list-style-type: none"> ✎ The site is already significantly degraded by the old ADF as well as historical ploughing; ✎ There is a boundary road already present thus making it easier to access the site; ✎ No archaeological and heritage artefacts were found on site ✎ It is the most suitable site in terms of favourable geotechnical conditions for the installation of the PV plant; since the ashcrete that has formed on the ADF is very stable (this would provide an ~7Ha platform, out of the total ~17Ha) ✎ The topsoil is already disturbed; and ✎ The PV plant will blend in with the existing land use (Grootvlei power station) and will be less visible from receptors and residents located to the north and west of the proposed site; <p>The basic assessment will only focus on this deemed environmentally feasible alternative site (Alternative site 1) and the two proposed feasible power line route options. Thus Alternative 1(S1) will be comprised of alternative site 1 with power line route F and Alternative 1(S2) will be comprised of alternative site 1 with power line route D.</p>		
Alternative site 2 (environmentally unfeasible)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>Site alternative 2 was found to unfeasible for the following reasons:</p> <ul style="list-style-type: none"> ✎ It is located in a channel valley bottom wetland to the south of the site, this was identified as a fatal flaw; ✎ The wetland still functions to a large extent; ✎ Primary vegetation is present in channelled areas; ✎ The site is less suitable in terms of geotechnical conditions compared to site alternative 1; and ✎ Located closer to local roads that link Grootvlei town to the Grootvlei power station. Motorists travelling along the roads will have views of the PV plant. 	26° 46.724'S	28° 29.864'E
Alternative site 3 (technically unfeasible)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>Site alternative 3 was found to unfeasible for the following reasons:</p> <ul style="list-style-type: none"> ✎ Is an old rehabilitated ADF with a platform of 4.8 ha, being too small to accommodate the PV facility. 	26° 46.251'S	28° 30.454'E
Alternative site 4 (environmentally unfeasible)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>Site alternative 4 was found to unfeasible for the following reasons:</p> <ul style="list-style-type: none"> ✎ It is located on what was predominately a wetland in the 1940s. ✎ It contains food plant species for the threatened butterfly <i>Aloeldes derfarta</i>. The rest of the site is impacted by historical ploughing and infill during the construction of the Grootvlei Power Station. ✎ Areas suitable for the PV plant are the secondary grassland that have been infilled to the south of the wetland channel are approximately 10.5 ha in size, divided roughly in two. These two sites are not large enough and will create a disjointed PV Facility which will lead to inefficiencies. ✎ Five, point specific heritage sites of varying heritage significance (graves) were also found on this site. ✎ Visually, site alternative 4 would not be suitable as residents would be in close proximity (less than 200m in some instances) to the PV plant as the site borders the Grootvlei village. 	26° 45.696'S	28° 29.478'E

BASIC ASSESSMENT REPORT

In the case of linear (powerline) activities:

Alternative:

Alternative power line S1 (feasible and preferred)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S1 would be the PV site located on alternative site 1 in combination with a 6.6 kVa power line will be routed from a substation/transformer and will transmit electricity from the PV plant to the Grootvlei power station This feasible layout alternative is Route F (1220m). It is a shorter distance than Route Alternative D, and remains close to existing servitude.

Latitude (S):

Longitude (E):

Refer to Appendix J for the Route Coordinates	

Alternative S2 (feasible but not preferred)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S2 would be the PV site located on alternative site 1 in combination with a 6.6 kVa power line will be routed from a substation/transformer and will transmit electricity from the PV plant to the Grootvlei power station This feasible layout alternative is Route D (1280m). This route is longer than Route F, and will have a greater impact on wetlands.

Refer to Appendix J for the Route Coordinates	

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S4 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>The Hydrogeological study assessed the impact of the PV facility on Alternative Site 1 (17ha), on the receiving environment (ADF). The ~7ha portion of the PV facility located on the ADF will be designed to capture the rainwater falling on the arrays and discharging the storm water. Any additional storm water management mitigations from the DWA from/as part of the WUL process and WUL consultation will be incorporated. Eskom must ensure that the receiving environment is not contaminated by storm water, if it is deemed polluted. The rain water Management system will capture 45 percent of precipitation that would already fall on the existing ADF (As it is estimated that the existing ADF would be covered by 45% of the arrays)resulting in reducing the potential of water that might infiltrate the ADF. The ~10ha portion located to the west of the ADF will have suitable storm water control measures as determined by DWA as part of the WULA consultation process.</p> <p>The PV panels already act as impermeable surfaces on the ADF, when this is combined with collection drains, a very high percentage of rain water could be captured and redirected so as not to come into contact with the ADF. Please refer to Appendix K for the conceptual design of the rain water catchment system.</p>		

BASIC ASSESSMENT REPORT

Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 4		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technological design alternatives

Alternative 1 (preferred alternative)
<p>The static PV panel arrays will be mounted on either a screwed/rammed pile, concrete pad or ballast foundation. The impact of the different foundations would not be significantly different and have thus been assessed as one impact. The EMP will propose mitigation measures for each foundation option during the construction phase. Cables will be laid in fairly shallow narrow trenches (40cm x 50cm) that will be backfilled and sealed.</p> <p>A single tracking or fixed panel array may be installed. The static array height would be limited to 2m above ground level, while single axis tracking arrays would exceed this value slightly. These two alternatives would not have significantly different impacts, and will thus be assessed as one alternative. The reason for including both static and single axes tracking arrays, is that Eskom would require competitive bids, if and after the Environmental Authorisation is obtained.</p> <p>The possible single tracking axis alternative would not utilise hydraulic motors (thus no oil), thus the impact between static and single tracking are very similar. Both types would utilise the same mounting.</p> <p>Dual axis tracking arrays will not be utilised or assessed for this project since their height would be in excess of 3 metres and would thus constitute a significantly different impact than the arrays proposed here.</p>
Alternative 2
Alternative 3
Alternative 3

d) design alternatives

Alternative 1 (preferred alternative)
Alternative 2
Alternative 3
Alternative 4

e) No-go alternative

<p>The “No Go” or “No Action” alternative refers to the alternative of not embarking on the proposed project at all. This alternative would mean that Eskom will not implement this Renewables project. It is important to note that the No Go alternative is the baseline against which all other alternatives and the development proposal are assessed.</p> <p>The No-go alternative as a specific alternative is considered less than ideal for the following reasons:</p> <ul style="list-style-type: none"> ➤ If the project does not commence Eskom may not meet its intention to roll-out 120 – 150 MWp of the PV plants; ➤ Eskom will not be able to reap the benefits of renewable energy at the Grootvlei Power Station using renewable energy, relative to power being generated; ➤ The portion of the PV facility on the old ADF would reduce potential infiltration of rain water that already falls onto the ADF.

BASIC ASSESSMENT REPORT

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A1 (preferred activity alternative)	~17 ha
The PV site footprint would be limited to Alternative site #1, of ~17ha in extent. The design of the facility commenced after a deemed environmentally feasible alternative site was identified. Only Alternative site 1 was deemed feasible based on the outcomes of the specialist studies, thus only one PV facility design exists. One conceptual layout design for the PV facility has been included. The detailed design of the portion of the PV facility on the ADF (to be completed by the contractor) will reduce 45% of the potential rainfall to fall on the old ADF out of the 100% that currently falls on the facility (i.e. as is without the PV facility) by covering 45% of the ADF with arrays. It should be noted that an output specification contract will be issued, thus the contractor will complete the final PV facility design and will be required to meet the minimum objective stipulated in the BAR mitigation measures and EMP.	
Alternative A2 (if any)	
Alternative A3 (if any)	
Alternative A4 (if any)	

or, for linear activities:

Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	~17ha (17000m ²)
Alternative A2 (if any)	
Alternative A3 (if any)	m ²

4. SITE ACCESS

Does ready access to the site exist?	YES ✓	NO
If NO, what is the distance over which a new access road will be built	m	
There are already two existing access roads close to the Grootvlei Power Station which will be utilised during the proposed construction of the PV plant, the R51 and the N3. The R51 is very close to the study area to the east and the N3 is approximately 5 km to the west of the study area. An Internal access road within the power station already exists to reach Alternative site #1, and no new roads should be required.		

Describe the type of access road planned:

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

BASIC ASSESSMENT REPORT

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	YES✓		Please explain
Yes, the proposed project is located within the Grootvlei power station property, which was constructed 1970. The property is zoned as industrial and is owned by Eskom, the applicant.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES✓		Please explain
The study area has been specifically zoned for the Grootvlei power station and its associated activities. The proposed project will generate renewable energy to be utilized for the operation of the Grootvlei Power Station.			
(b) Urban edge / Edge of Built environment for the area	YES✓		Please explain
Yes, the proposed project is located within the Grootvlei power station property.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality	YES✓		Please explain
The proposed project will not have any negative impacts with regards to IDP and SDF of the Local Municipality. A temporary and limited amount of unskilled labour may be required for the preparation for the construction PV plant which could contribute, to one of the employment objectives in this local municipality.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
Unknown. An approved Structure Plan could not be found.			
(e) An Environmental Management Framework (EMF) adopted by the Department	YES✓		Please explain
An EMF could not be identified for the area. The activity is in line with the current land use of the Grootvlei power station, thus it will be developed on a brownfield site within the region. It is unlikely that the PV facility, (which is a renewable energy project) would violate identified constraints zones or sensitive geographical areas.			
(f) Any other Plans (e.g. Guide Plan)			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES✓		
The land use aspect remains unaffected by the PV facility, since it is located on the Eskom Grootvlei power station property. Eskom has identified its own project and programmes guided by IDP requirements.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES✓		Please explain
The proposed construction and operation phase of the PV will provide temporary and small amount unskilled labour opportunities to the local community during the construction and operation phase of the PV site.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES✓		Please explain
All the necessary services with adequate capacity are currently available and there will not be any need for additional capacity to be created to cater for the proposed development. The PV facility will increase current electricity supply.			

BASIC ASSESSMENT REPORT

<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>YES✓</p>		<p>Please explain</p>
<p>The proposed development will be constructed within the Grootvlei Power Station property, an area already designated to generate electricity. It is not anticipated that the development will have any detrimental implications for the municipal infrastructure. No response was received from the local Municipality was received after the BA PPP notification.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES✓</p>		<p>Please explain</p>
<p>Yes, Eskom generates approximately 95% of the electricity used in South Africa and approximately 45% of the electricity used in Africa. Eskom generates, transmits and distributes electricity to industrial, mining, commercial, agricultural and residential customers and redistributor. Eskom is responsible for the provision of reliable (i.e. stable) and affordable power to South Africa.</p> <p>Being the supplier of electricity throughout South Africa, Eskom has to introduce renewable energy sources to supply power (by means of solar, wind, hydroelectric and pumped storage, with further research into others). Eskom is committed (to) and supports the Green Economy Accord signed by government, labour, business, and key stakeholders as part of the plan to shift towards a lower carbon-intensity economy while also increasing jobs and industrial development. This proposed project is an indication of Eskom's commitment to shift towards a lower carbon-intensity economy while also increasing jobs and industrial development.</p>			
<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	<p>YES✓</p>		<p>Please explain</p>
<p>The preferred site location for the proposed project is within the Grootvlei power station property such that it is in proximity to the power station and can connect to the power station to augment the auxiliary power use. The PV plant will blend in with the current land use and a portion of the PV facility that is proposed to be placed on the ADF will result in a beneficial end use of the ADF, thus having a positive impact.</p>			
<p>9. Is the development the best practicable environmental option for this land/site?</p>	<p>YES ✓</p>		<p>Please explain</p>
<p>The feasible site is the least impacting environmental option, and a portion of the PV facility that is proposed to be placed on the ADF will result in a beneficial end use of the ADF. Use of the old ADF by a portion of the PV facility for renewable energy production can be considered the best practical option for this land.</p>			
<p>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</p>	<p>YES✓</p>		<p>Please explain</p>
<p>The proposed project will augment auxiliary energy supply at the Grootvlei Power Station utilising renewable energy meaning less energy will be required from the grid. The placement of a portion of the PV facility on the old ADF will be of benefit to the environment going forward.</p>			
<p>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</p>	<p>YES✓</p>		<p>Please explain</p>
<p>Eskom proposed the construction and operation of the solar PV plant that will result in an additional small amount of electricity being available from the Grid. This will result in a subsequent decrease in the amount of electricity obtained from the grid to support the auxiliary plant. This project is part of a bigger (national project roll out) by Eskom to support the use of renewable energy by means of PV, to generate power. There is a possibility that Eskom could have the opportunity going forward, to utilise selected brownfield sites (incl ADF's) to construct PV facilities upon them. A precedent could be set to potentially drive the roll out of PV facilities on such brownfield sites, having a beneficial impact on Eskom's ADFs.</p>			
<p>12. Will any person's rights be negatively affected by the proposed activity/ies?</p>		<p>NO✓</p>	<p>Please explain</p>
<p>No human rights will be infringed upon by the proposed construction of the PV plant</p>			
<p>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</p>		<p>NO✓</p>	<p>Please explain</p>
<p>No, the 'urban edge' will not be comprised. The PV facility will be placed on Eskom Property.</p>			

BASIC ASSESSMENT REPORT

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES ✓	[REDACTED]	Please explain
The proposed project will contribute to SIP8: "Green Energy in support of the South African economy" by utilizing solar panels to generate renewable energy.			
15. What will the benefits be to society in general and to the local communities?	Please explain		
A small number of temporary jobs will be created during construction only. The plant does not require man-power for operations.			
16. Any other need and desirability considerations related to the proposed activity?	Please explain		
17. How does the project fit into the National Development Plan for 2030?	Please explain		
The project is in line with the Government's vision of utilising cleaner green energy, and reducing SA reliance on fossil fuels, providing electricity, and expanding infrastructure.			
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.			
EIMS (Pty) Ltd have been appointed by Eskom to undertake the Basic Assessment Process, an Environmental Management Programme (EMPr), in order to identify and address any impacts (positive and negative) that the proposed PV facility and associated infrastructure might have on the environment. Specialist studies have been undertaken to ensure that negative impact are minimised, positive impact are maximised, while promoting compliance with the principles of environmental management. In addition the specialist studies undertaken will ensure that the effects of activities on the environment receive adequate consideration before they are impacted upon by the proposed PV facility and associated infrastructure. As part of the BA process numerous stakeholder and organs of state have been requested to comment on issues related the development, to ensure all impacts are assessed. This has also assisted in ensuring that pertinent environmental attributes have been identified and considered such that an informed decision can be made on the proposed PV facility and associated infrastructure. Thus the BA process will ensure that the best environmental management options are employed for this particular activity.			
19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.			
An application to undertake a Basic Assessment has been submitted to the Competent Authority (the Department of Environmental Affairs) prior to the undertaking of the Basic Assessment process. The BAR has ensured that potential disturbance to the environment and ecosystems would be minimised, and where possible mitigated. The project will also ensure that loss of non-renewable resources (fossil fuels) is minimised, while promoting renewable energy resources. The BAR has taken a risk-averse approach to the assessment, and excluded three of the alternatives sites. The specialist studies undertaken assessed the visual/sense of place impact, the ecological impact, as well as the cultural heritage impact that the facility could have. The feasible site, in addition to mitigation measures proposed in the BAR will promote the duty of care, in addition to being feasible and adequate measures to minimise the potential impact on the environment.			

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Basic Assessment Acknowledgement of application receipt letter	Outlined key specialist studies and Report requirements for renewable energy projects.	Department of Environmental Affairs	2012/08/23
National Water Act (Act No. 36 of 1998)	The proposed PV facility on alternative site #1 (which is linked to Alternative 1(S1) & 1(S2))will not directly impact on any wetlands, since the ADF will be utilised as far as possible, with a	Department of Water Affairs	1998

BASIC ASSESSMENT REPORT

	<p>section of the PV facility located on the secondary grassland to the west of the ADF on alternative site 1.</p> <p>In addition the power line connecting the PV facility to the power station will cross a primary degraded wetland. There is a requirement for a Water Use Licence.</p>		
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	The specialist ecological assessment identified species of concern on some of the alternative sites. These sites have been removed as feasible alternative sites. There will be no further NEMBA compliance requirements for the selected PV Site alternative.	Department of Environmental Affairs	2004
South African National Heritage Resources Act (Act No. 25 of 1999)	The Specialist Phase 1 HIA identified heritage features on one of the alternative sites (#4). This site has been removed as a feasible site. The SAHRA has been notified of the proposed project.	South African National Heritage Resources Authority.	1999
National Environmental Management: Waste Act (Act 59 of 2008)	A portion of the PV facility will be located on a disused old ADF. Eskom has obtained a legal opinion stating that no closure or decommissioning listed activities would be triggered under the NEMWA as the facility ceased usage and was fully rehabilitated by the early 1970's. This opinion (that a Waste Management Licence will not be required) was confirmed by the DEA Licencing section – find attached in Appendix J-3&4	Department of Environmental Affairs	2008

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES ✓

If YES, what estimated quantity will be produced per month?

Unknown

The PV facility construction will be in a pre-fabricated nature, and concrete casting will be done in situ. Any solid waste that is generated, will be disposed of as per the Eskom Grootvlei power station waste management procedure.

How will the construction solid waste be disposed of (describe)?

A licensed waste disposal service provider will be utilised to collect and transport all general construction solid waste from the construction sites and dispose of these at a relevant and suitably licenced disposal facility. The waste will be managed in accordance with the EMPr and Eskom station waste management procedures.

Where will the construction solid waste be disposed of (describe)?

BASIC ASSESSMENT REPORT

The solid waste from construction activities will be disposed of at a suitably licensed disposal facility. The waste will be managed in accordance with the EMPr and Eskom station waste management procedures.

Will the activity produce solid waste during its operational phase? NO ✓

No solid waste will be generated during the operational phase.

If YES, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Dipaleseng Municipality's registered landfill site or other suitably licenced facility, possibly including Grootvlei Power Station.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

All solid waste produced will be disposed of at the nearest suitably licenced landfill, of which Dipaleseng Municipality Waste disposal site and Grootvlei power station are the closest.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

any part of the solid waste be classified as hazardous in terms of the NEM:WA? NO ✓

Any hazardous waste (e.g. fuel, oils, pesticides, herbicides) that is produced during the construction phase of the project, is likely to be of limited volume and will be collected by a licensed hazardous waste disposal service provider and disposed of at the nearest registered disposal site for hazardous material. It is understood that the application of certain products utilised on a typical construction site and disposal of small spills and packaging is unlikely to trigger the need for a full EIA and/or Scoping or a waste management licence. The waste will be managed in accordance with the EMPr and Eskom waste management procedures.

Relevant mitigation measures have been included to manage the excavated ADF material, such that it will restrict the contractor from excavating ash off the ADF and dumping it elsewhere.

If YES Inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? NO ✓

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? NO ✓

If YES, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site? NO ✓

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? NO ✓

If YES, provide the particulars of the facility:

Facility name:

Contact person:

Postal address:

Postal code:

Telephone:

E-mail:

Cell:

Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Waste Management for the PV plant will be in accordance with that of the EMPr and/or Grootvlei power station waste management systems.

BASIC ASSESSMENT REPORT

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

NO ✓

If YES, is it controlled by any legislation of any sphere of government?

NO ✓

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

Dust and vehicular emissions will be produced during the construction phase. The potential air quality impacts, related to PV have been identified and assessed in this Basic Assessment report. All air emissions will be within the stipulated limits and guidelines and are not anticipated to trigger the need for any further permits or licences.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

NO ✓

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?

YES ✓

If YES, is it controlled by any legislation of any sphere of government?

YES ✓

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the noise in terms of type and level:

Noise generated will be limited to the construction site, resulting from the use of machinery and the movement of construction vehicles. The noise impact during construction phase has been assessed in this BAR and will be managed in accordance with the EMPr. Noise level will be in line with industrial dB levels.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

The activity will not use water ✓

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use authorisation (general authorisation or water use licence) from the Department of Water Affairs?

YES ✓

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

A pre-consultation meeting was held with the DWA (10 December 2013) as part of the Water Use licence process to confirm the scope of work for the Water Use Licence application. A water use licence (WUL) is required for the construction of the power line that will connect the PV facility to the Grootvlei power station.

The relevant Department of Water Affairs officials have been registered as Key I&AP's and have been invited to comment on the proposed project.

14. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The proposed project will utilise renewable resources to generate electricity and will use current technology thus making the development energy efficient.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

BASIC ASSESSMENT REPORT

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

The project involves the construction and operation of a proposed PV facility within the Eskom Grootvlei Power Station property in the south-west of Mpumalanga Province. The proposed footprint of the PV facility (17ha) area is flat and approx 7Ha is occupied by a ~ 4m high old rehabilitated ADF from the Grootvlei Power Station. The area lies at an altitude of around 1540 meters above sea level is covered mainly by grass, wetlands and weeds. The Grootvlei area historically (which was construction in the early 1900s) was an extensive wetland system. There are cultivated lands immediately to the north, south and east from the power station.

Only one deemed environmentally feasible site exists on the power station property (Alternative site #1) based on the outcomes of the specialist studies. This site (in comparison to the other alternative sites) contains no primary wetlands, no heritage features and is not located on unsuitable geotechnical material. As described above, the two feasible alternatives in the BAR are thus limited to:

- ☞ Alternative 1(S1) = the PV facility on alternative site 1 and power line Route F; and
- ☞ Alternative 1(S2) = the PV facility on alternative site 1 and power line Route D.

Section B Copy No. (e.g. A):

N/A

- Paragraphs 1 - 6 below must be completed for each alternative.

- Has a specialist been consulted to assist with the completion of this section?

YES ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Mpumalanga
District Municipality	Gert Sibande District Municipality
Local Municipality	Dipaleseng Local Municipality
Ward Number(s)	Ward 3
Farm name and number	Rietfontein 458 IR
Portion number	0
SG Code	T01IR0000000045800000

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

The study area is within the Grootvlei Power Station property in Grootvlei, Mpumalanga and falls within the Dipaleseng Local Municipality which is part of the Gert Sibande District Municipality.

Current land-use zoning as per local municipality IDP/records:

Grootvlei PowerStation, zoned as agriculture with industrial use

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

NO ✓

The proposed project will be constructed within the Grootvlei Power Station property.

BASIC ASSESSMENT REPORT

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1: PV alternative site 1 and power line route F

	1:50 – 1:20 ✓	

Alternative S1: PV alternative site 1 and power line route D

	1:50 – 1:20 ✓	

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.4 Closed valley	
2.2 Plateau		2.5 Open valley	
2.3 Side slope of hill/mountain		2.6 Plain	<input checked="" type="checkbox"/>
		2.7 Undulating plain / low hills	
		2.8 Dune	
		2.9 Seafront	

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1: PV alternative site 1 and power line route F	Alternative S2: PV alternative site 1 and power line route D	
Shallow water table (less than 1.5m deep)	YES ✓	YES ✓	
Dolomite, sinkhole or doline areas	NO ✓	NO ✓	
Seasonally wet soils (often close to water bodies)	YES ✓	YES ✓	
Unstable rocky slopes or steep slopes with loose soil	YES ✓	YES ✓	
Dispersive soils (soils that dissolve in water)	YES ✓	YES ✓	
Soils with high clay content (clay fraction more than 40%)	YES ✓	YES ✓	
Any other unstable soil or geological feature	NO ✓	NO ✓	
An area sensitive to erosion	YES ✓	YES ✓	

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

BASIC ASSESSMENT REPORT

4. GROUND COVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

	Natural veld with scattered aliens ^E ✓	
	Cultivated land ✓	

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River		NO ✓	
Non-Perennial River		NO ✓	
Permanent Wetland	YES ✓		
Seasonal Wetland	YES ✓		
Artificial Wetland		NO ✓	
Estuarine / Lagoonal wetland		NO ✓	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The wetland study found indicators of wetland conditions in the soils across the Grootvlei alternative sites. Prior to the site visit, a desktop analysis of the area was undertaken by assessing aerial photographs of the proposed site alternatives for an indication of wetland boundaries. The wetland boundaries were confirmed on site. Aquatic systems that have relevance to the alternative sites are two Channelled bottom wetlands with seepage zones on their perimeters. These wetlands have a fairly slow slope and are located in a slightly undulating terrain.

The power line routes of Alternative 1(S1) and Alternative 1 (S2) will potentially be the only direct impact on wetlands on the Grootvlei site. The channelled valley bottom wetlands are located on site alternative 4 and on alternative site 2. These have been altered by development such as the historical construction of the Grootvlei power station, ADF’s, infill and ploughing. The Grootvlei property is located on an extensive wetland system and erosion is evident in the system.

There was a presence of indigenous species (*Typha capensis*, *Phragmites australis* and indigenous grass) and alien species (*Eucalyptus*) in the overall wetland system on the property. There is however, a portion of this wetland channel that remains natural on alternative site #4. The wetland system in general is therefore moderately to largely modified in terms of the biota, hydrology geomorphology and functioning.

Farm dams are located outside site alternative #2 in other channelled valley bottom wetland. Several roads and a railway line cross this wetland. Some infill is present in the wetland from the ash dam and the Grootvlei power station.

Temporary wetland zones as well as seasonal wetlands were also noted on site. The temporary wetland zone runs through the northern and south-western sites and northern portions of the south-eastern site. A large number of forb species including numerous pioneer species were observed and this indicates disturbances in the wetland.

The Mpumalanga C-Plan (in Ferrar and Lotter, 2007) indicates all the four sites are located in a sub-catchment that is highly significant for the maintenance of aquatic biodiversity. Please refer to Figure 8 for a map showing the Aquatic biodiversity sub-catchments according to the C-Plan.

The proposed PV facility on alternative site #1 (which is linked to Alternative 1(S1) & 1(S2))will not directly impact on any wetlands, since the ADF will be utilised as far as possible, with a section of the PV facility located on the secondary grassland to the west of the ADF on alternative site 1.

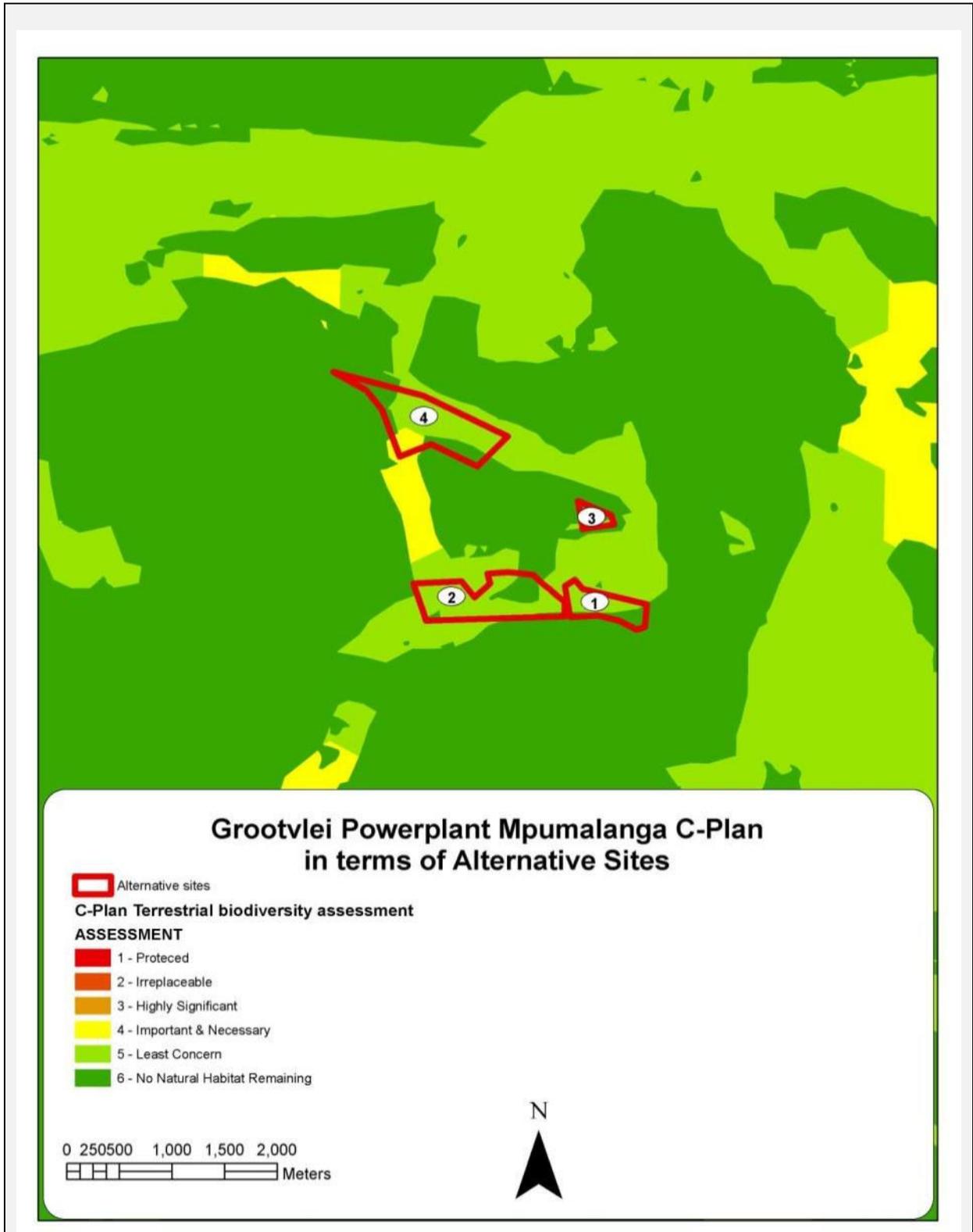


Figure 9: C-plan and alternative sites

BASIC ASSESSMENT REPORT

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	Dam or reservoir	Polo fields
Low density residential ✓	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture ✓
Retail commercial & warehousing	Old age home	River, stream or wetland ✓
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station ✓	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard ✓
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan) The site is located in a sub-catchment that is highly significant for the maintenance of aquatic biodiversity (refer to Figure 8).		NO ✓
Core area of a protected area?		NO ✓
Buffer area of a protected area?		NO ✓
Planned expansion area of an existing protected area?		NO ✓
Existing offset area associated with a previous Environmental Authorisation?		NO ✓
Buffer area of the SKA?		NO ✓

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

NO ✓

BASIC ASSESSMENT REPORT

A heritage site assessment was undertaken by PGS - Heritage & Grave Relocation Consultants for the development of PV facility at the Grootvlei power station. During the survey five point specific heritage sites of varying heritage significance were found. All five structures were identified on site alternative 4 and most of the areas were previously disturbed by industrial activities of the Grootvlei Power Station.

No archaeological and heritage resources were found on alternatives site 1, 2 and 3. It is the specialist view that Alternative site #1 was acceptable for the proposed PV facility from a heritage perspective. Thus Alternative 1(S1) & 1 (S2) will not impact on any heritage resources.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Will any building or structure older than 60 years be affected in any way?		NO ✓
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		NO ✓
If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.		

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

Dipaleseng Local Municipality is located in the town of Balfour, with an estimated population of 55 634 citizens according to Council data. Dipaleseng Municipality falls within the Gert Sibande District Municipality. The majority of people in the Dipalieseng Local municipality are involved in the agricultural sector, followed by electricity, wholesale and retail trade, transport and construction and then manufacturing. The population distribution the area is largely urbanized (91% urban and 9% rural). According to SA Stats (2007) the unemployment rate in the local municipality is 26 % and the percentage number of the non-economically active people is 31%.

Economic profile of local municipality:

There is a general tendency of migration from rural to urban areas, as is the case in the rest of the Mpumalanga Province. The majority of the rural population is active within the agricultural sector. The population distribution of the area is largely urbanized (91% urban and 9% rural). This tendency is directly related to the strong industrial and manufacturing character of the area.

Level of education:

Nearly a third (29%) of the total local population has grade 8 or an equivalent qualification, whilst exactly the same proportion had primary education according to a survey conducted in 2007 per ward. Twenty percent have matric or an equivalent qualification whilst a further 7% have tertiary education. Residents with tertiary education were more prevalent in Ward 1,3 and 5. The highest proportions of those with primary education were likely to be found in Ward 1, 3, 4, 5 and 6.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

A 10MW solar PV is expected to cost in the region of R270 million

What is the expected yearly income that will be generated by or as a result of the activity?

Unknown at this stage

BASIC ASSESSMENT REPORT

Will the activity contribute to service infrastructure?	YES ✓
Yes. The development of the proposed solar PV facility will supplement the stations internal requirement for Electricity supply without the use of fossil fuels.	
Is the activity a public amenity?	NO ✓
No, however the facility will act as a public good. The electricity generated will be utilised by a publicly owned / state owned entity. These benefits will not be limited to Eskom, but will benefit South Africa as a whole. The amount of electricity produced to augment the power station will reduce the same amount required from the grid – thus the amount the solar PV facility that can be produced if equivalent to the amount available to the grid.	
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	For a 10MW plant: approximately 15 temporary jobs. More staff will be required where construction periods are shorter. In addition to direct jobs created there is also the indirect employment opportunities created.
What is the expected value of the employment opportunities during the development and construction phase?	From investigations into previous solar PV projects, the average wage bill associated with the construction of a Solar PV plant is 1.48% of the total capital expenditure. For a 10MW plant with a capital expenditure of R270 million: R4.0 million wage bill
What percentage of this will accrue to previously disadvantaged individuals?	On average, 75% of jobs created during solar PV construction are at low or semi-skilled levels.
How many permanent new employment opportunities will be created during the operational phase of the activity?	5 full-time jobs and 1 part-time job This includes: 3 security staff 2 maintenance 1 part time technician
What is the expected current value of the employment opportunities during the first 10 years?	For a possible 10MW plant, based on the possible breakdown given above: R6million in 10 years
What percentage of this will accrue to previously disadvantaged individuals?	On average, 75% of jobs created during solar PV operation are at low or semi-skilled levels.

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This

BASIC ASSESSMENT REPORT

Terrestrial Ecosystems		Aquatic Ecosystems		
Management: Biodiversity Act (Act No. 10 of 2004)	Vulnerable✓ Alternative site #1 has sensitive habitats identified under CBA and NEMBA. The ecological study identified that these system were disturbed on the site through historical ploughing.	channelled wetlands, flats, seeps pans, and artificial wetlands)		
			YES ✓	NO ✓

- d) **Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

A specialist wetland study was undertaken on the 25th to the 26th of October 2012. Please refer to Appendix D for the complete report. The study area (Grootvlei Powerstation) is located in quaternary catchment C12K. The site slopes eastwardly towards the Molspruit. The Molspruit flows towards the south-west and eventually enters the Vaal River. The Grootvlei power station is constructed at the confluence of two wetland units, one entering the site from the north-west and one from the south-west. The wetlands are classified as channelled valley bottom wetlands with seepage zones on the sides. These wetlands have a fairly low slope, and they are located in a slightly undulating terrain. They are crossed by several roads and therefore the wetland channels are modified. Erosion is taking place in some portions of the wetlands due to the disturbances present. Please refer Figure 10 for the wetlands identified by the specialist.

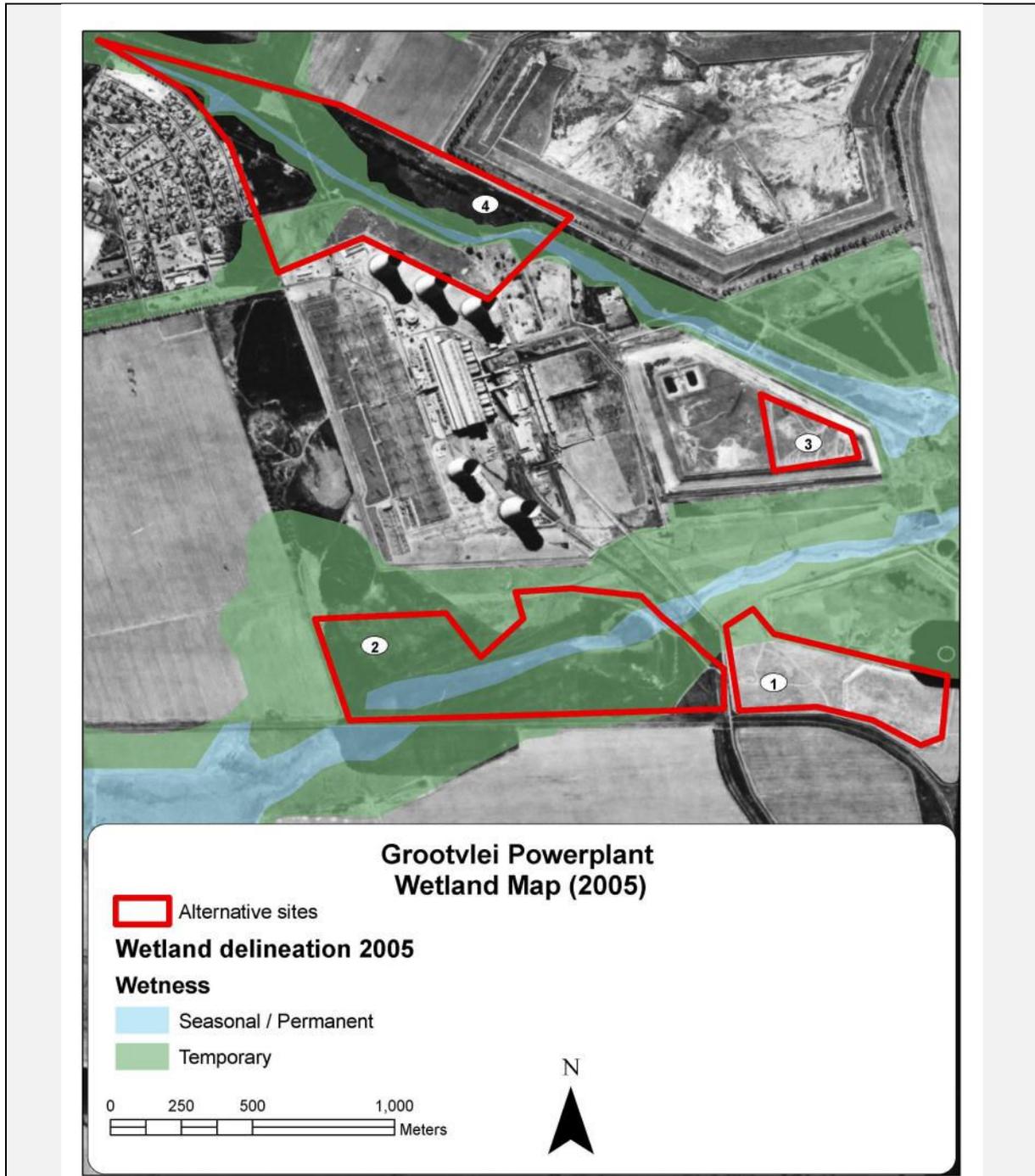


Figure 10: Specialist wetland assessment during the planning and design phase.

Vegetation present on the western portions of the site includes the Soweto Highveld Grassland (Figure 11) and falls within the Mesic Highveld Grassland Bioregion. This vegetation type has medium to high, dense tufted vegetation, dominated by *Themeda triandra* with several grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Tristachya leucotrix* and *Heteropogon contortis* also present (Mucina & Rutherford, 2006). The vegetation type is classified as Endangered in Mucina and Rutherford (2006) and as Vulnerable in the NEMBA list (2011).

Andesite Mountain Bushveld is present on the eastern portions of the site (Figure 11) and falls within the Central Bushveld Bioregion. This vegetation type is a medium-tall, dense thorny bushveld occurring at an altitude between 1350m and 1800m. The bushveld occurs on hill slopes in an undulating landscape and has a well-developed grass layer. The Andesite Mountain Bushveld is classified as Least Threatened, with 15% transformed. Impacts are mainly cultivation and urbanization. Erosion is mostly very low (Mucina & Rutherford, 2006). This vegetation type is not listed as threatened under NEMBA (2011). Aerial photographs of the site indicate that most of the land cover was modified during the

construction of the Grootvlei power station.

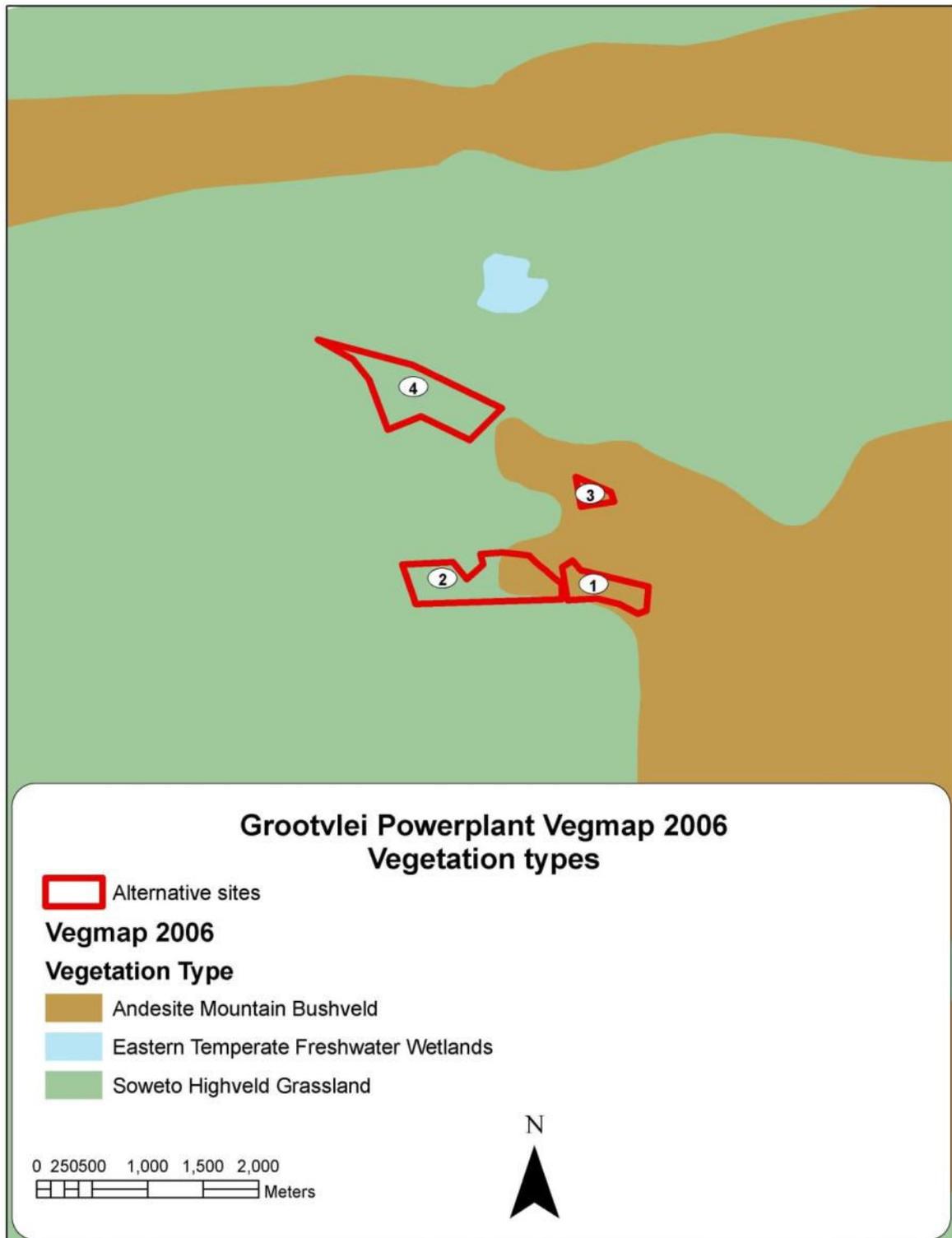


Figure 11: Vegetation types present on site according to Mucina & Rutherford (2006).

A site specific vegetation survey was carried out on the four alternative sites by the specialist to verify the broad level vegetation mapping. The vegetation on site was divided into five vegetation groups with similar habitat.

Temporary wetland zones are present on both sides of the wetlands running through the northern and south-western sites and on the northern portion of the south-eastern site. A number of species are present in the wetland, including

indigenous and alien species. The temporary wetlands are dominated by grass species. A large number of forb species are present in the wetlands, including numerous pioneer species. This is an indication of disturbance in the wetland. Portions of the temporary wetlands were ploughed in the past, which will affect the vegetation composition. The temporary zone of the wetland associated with the northern site do however has larger species diversity and it appears that this section has fewer disturbances. From a vegetation point of view the wetland has a moderate sensitivity. Please refer to Appendix D: ecology report, Table 2 for the list.

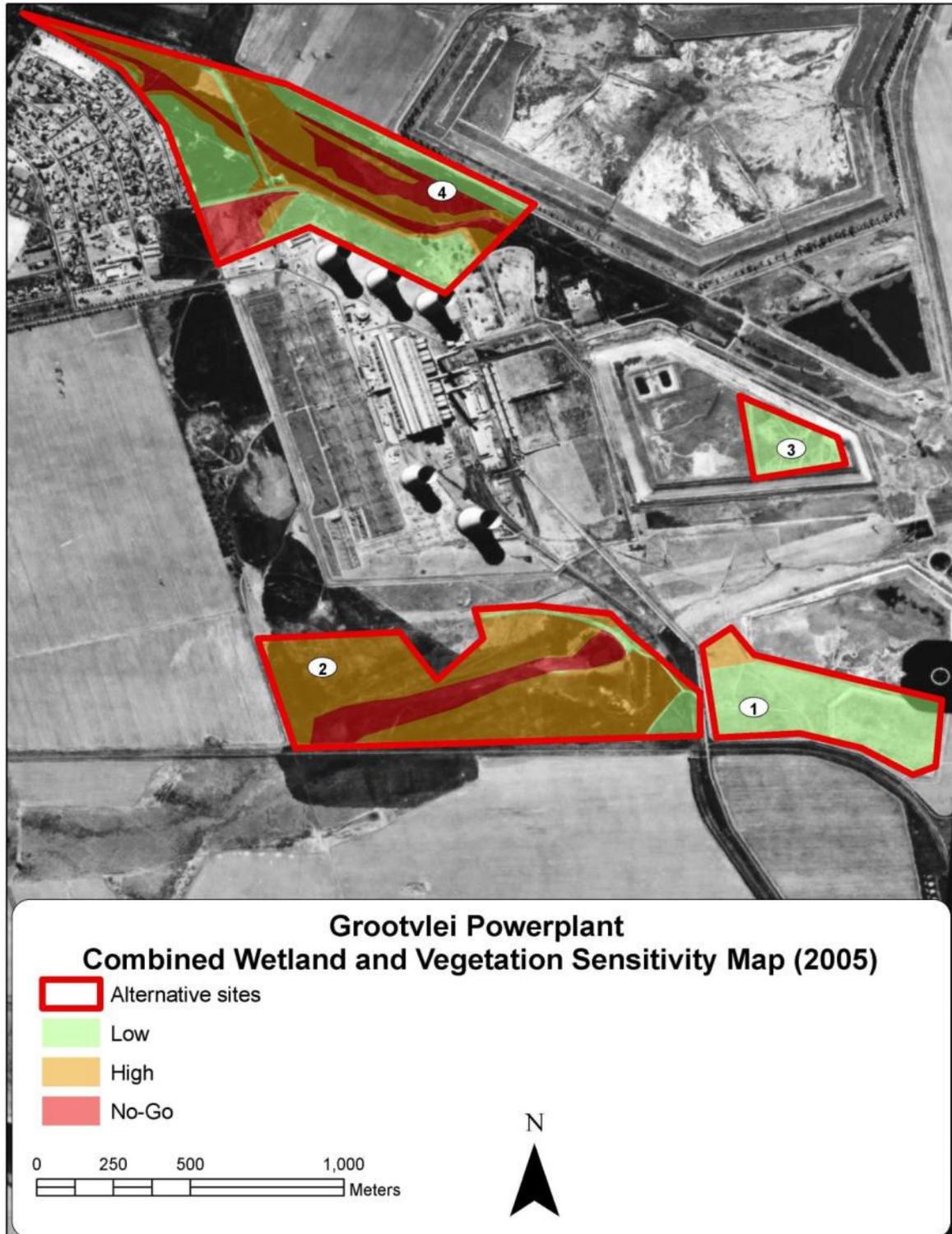


Figure 12: Wetland sensitivity map

The seasonal and permanent wetness zones in the southern section of the wetland are mostly associated with the wetland channels and the lower-lying centreline of the wetland. The channels are mostly artificial and some sand mining in the centre of the wetland in the 1940s resulted in a depression in the wetland that remains wet for a prolonged period of time. In the northern wetland unit the channels are partially natural, but mostly modified for development purposes. Erosion is also taking place in the channels, thereby contributing to the disturbance.

The vegetation is dominated by *Typha capensis*, with some *Phragmites australis*, *Cyperus spp* and *Juncus* species. Several grass and forb species are also present, including a number of alien and invasive species. Please refer Appendix D: ecology report, Table 3 for the list of species observed in the permanent wetland areas.

It appears that the decommissioned ADF (on alternative site 1) has a thin layer of topsoil and is missing in various places. Due to the hardening, shallow topsoil and uneven surface of the ADF water accumulates in places and results in wetland species being present in patches on the ADF. **These areas or patches on the ADF should however not be viewed as wetlands**. The reason for this is that the vegetation on the ADF (part of Alternative site 1) has a high number of alien and invasive species present. This is a result of the relative age of vegetation establishment. From a vegetation point of view the ash ADF is of low sensitivity. Please refer to Appendix D: ecology report, Table 4 for vegetation observed on site.

Remainder of the vegetation unit is grassland, present outside the wetland areas, that has never been ploughed. This is a fairly small vegetation unit, located between the wetland on its western, southern and eastern borders and cultivated fields and an ash dam on the northern boundary. *Albuca* sp and *Hypoxis* sp were very common in the grassland and *Asclepias cf eminens* were observed in the grassland and nowhere else. A number of forb species were observed in the grassland, as well as the invasive tree *Eucalyptus* sp. Please refer to Appendix D: ecology report.

In this instance disturbed vegetation includes secondary grassland, since most of the disturbed grassland has been altered to such an extent that it shows the same species composition as the secondary grassland. The difference however would be that there is no evidence of ploughing and wide-scale conversion of the specific site. The specialist used secondary grassland in the description of the alternatives, where indeed there is evidence that the area was ploughed for a long period of time and that the vegetation community is a deflected climax. Most of the areas outside the wetlands have been ploughed in the past and large areas of infill are present as well. The portion of vegetation on the alternative site 1, outside the ADF, is affected by various disturbances. These include Alternative 1(S1) and Alternative 1(S2). The ash on the ADF on alternative site #1 used to flow from the top of the ADF into the area adjacent to the west of the disposal facility(Figure 13) and can be seen and as a white deposit visible in the area adjacent to the ADF(Figure 14). There are areas on the walls of the ADF that present patches of ash deposits. These may be as a result of isolated leaching from the ADF.



Figure 13: Ash flow from the top of the ADF into the area adjacent to the west of the disposal facility at Alternative site #1.



Figure 14: White Ash deposit visible in the area adjacent to the ADF on Alternative site #1.



Figure 15: View of the temporary wetland zone in the southern wetland unit.



Figure 16: Permanent wetness zone in the southern wetland unit in alternative site 2, or the South Western site.



Figure 17: Permanent wetness zone in the northern wetland unit in alternative site 4, or the Northern site.



Figure 18: Thin topsoil layer and established vegetation on the ADF on the south-eastern alternative site (alternative site 1)



Figure 19: Vegetation established on the ADF in the North Eastern alternative site 3.



Figure 20: View of primary vertic clay grassland on the northern alternative site 4.



Figure 21: Disturbed vegetation on the South Eastern alternative site 1



Figure 22: Infill in the south-western alternative site (alternative site 2).

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Kosmos News/Nuus	
Date published	14 September 2012 for the initial project notification	
Site notice position	Latitude	Longitude
	26° 46.088'S	28° 28.792'E
	26° 45.825'S	28° 29.435'E
	26° 45.621'S	28° 29.038'E
	26° 47.430'S	28° 31.120'E
Four A2 Correx board site notices were placed at various locations around the Grootvlei power station.		
Date placed	12 September 2012	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (telephone number or e-mail address)
Mr. Lemson Betha	WESSA -	lbetha@wessanorth.co.za
Mr. Garth Barnes	WESSA Conservation officer	gbarnes@wessanorth.co.za
Mr. Godfrey Tshivhalavhala	SAHRA Mpumalanga -	gtshivhalavhala@mp.sahra.org.za
Mr. Piet Botha	Dipaleseng Local Municipality	dipaleseng@worldonline.co.za

BASIC ASSESSMENT REPORT

Mr. Fikile Sithole	Dipaleseng Local Municipality - Environmental Manager	dipaleseng@worldonline.co.za
Mr. Robbie Hall	Dipaleseng Local Municipality – Ward 3 councillor	robbie.keepusall@gmail.com
Patrick Malebye	Dipaleseng Local Municipality	malebyep@dipaleseng.gov.za
Mr. Londiwe Mambatha	Dipaleseng Local Municipality	mambathan@yahoo.com
Mr JB Maseko	Dipaleseng Local Municipality	susan.mofokeng@yahoo.com
Mr Tebogo	Gert Sibande District Municipality	d.hlanyane@gertsibande.gov.za
Dan Hlanyane	Gert Sibande District Municipality	tebogo@envirion1.agric.za
Mr. S Sewnarain	Gert Sibande District Municipality	
Mr TG Botha	Grootvlei resident : landowner of Farm Planfontein	theuns@compumail.co.za
Mr. T. De Bruin	Grootvlei resident : landowner of Farm Rowersdam	tjaart@vaalcom.co.za
Mr. AS De Bryn	Grootvlei resident : Farm landowner	debruyana@megasurfwifi.co.za
Mr Doug Pullen	Grootvlei resident: Landowner of Farm Panfontein	
Mr. DW Pretorius	Grootvlei resident: Landowner of Farm Modderfontein	

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

A notification letter was sent out to pre-identified Key Interested and Affected Parties (I&APs) via e-mail and registered post on the 12th of September 2012. In addition site notices were placed around Grootvlei Power Station and a newspaper advert was placed. To date, no comment was received.

The DBAR was made available for public review (the report was made available at the Balfour Library and on the EIMS website) from the 6th of December 2013 until the 22nd of January 2014. No comments were received during the DBAR comment period. Hard copies were couriered directly to the following government departments as part of the PPP review period:

- Mpumalanga Department of Environmental Affairs;
- Mpumalanga Tourism and Parks Agency; and

BASIC ASSESSMENT REPORT

- Department of Water Affairs.
- No comments were received during the review period.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	E-mail	Postal Address
National Department of Water Affairs	roetsr@dwa.gov.za	012 392 1352	012 392 1359	roetsr@dwa.gov.za	P/Bag X995, PRETORIA, 0001
National Department of Environmental Affairs	Milicent Solomons	012 395 1852	012 320 7539	MSolomons@environment.gov.za	Private Bag X447 Pretoria 0001
National Department of Rural Development and Land Reform	Tshepiso Monnakgotla/ Gugile Nkwinti	012 312 9300	012 323 3306	nbunu@ruraldevelopment.gov.za	Private Bag X833 Pretoria 0001
National Department of Provincial and Local Government	Elroy Africa	012 334 0676	012 321 4537	elroy@cogta.gov.za	Private Bag X804 Pretoria 0001
National Department of Provincial and Local Government	Radihoana Selepe	012 334 0740	012 334 0703	sol@cogta.gov.za	Private Bag X804 Pretoria 0001
Mpumalanga Department of Economic Development, Environment and Tourism	Lemmy Mdluli	013 766 4583	013 766 4613	Lemmy@mpg.gov.za	Private Bag X11205 Nelspruit 1200
Mpumalanga Department of Economic Development, Environment and Tourism	Jabu Maluleka	013 766 6076	013 766 8243	SMaluleka@mpg.gov.za	Private Bag X11205 Nelspruit 1200
Mpumalanga Department of Economic development, Environment and Tourism	Garth Batchelor	013 766 6061	013 766 6061	gbatchelor@mpg.gov.za	Private Bag X11219 Nelspruit 1200
Mpumalanga Department of Economic Development, Environment and Tourism	Roy Mandlazi	013 799 1475	013 799 1476	MandlaziRR@ledet.gov.za	
Mpumalanga Department of Economic Development, Environment and Tourism	Marebane Surgeon	013 766 4584	013 766 4614	sgmarebane@mpg.gov.za	PO Box 2777 Ermelo 2350

BASIC ASSESSMENT REPORT

Mpumalanga Department of Economic Development, Environment and Tourism	Dineo Tswai	013 690 2595	013 690 3704	dtswai@mpg.gov.za	PO Box 383 Witbank 1035
Mpumalanga Department of Economic Development, Environment and Tourism	Charity Mthimunye	013 690 1279	013 656 5469	cnmthimunye@wit.mpu.gov.za	Private Bag X 7255 Witbank 1035
Mpumalanga Department of Economic Development	Bheki Mhlanga	013 799 1477	013 799 1476	mhlangawtb@ledet.gov.za	PO Box 2777 Ermelo 2350
Dept of Agriculture				baloyims@agrigo.nrprov.gov.za	
Mpumalanga Department of Agriculture	Cindi Dan'sile	013 754 0727 /01		DansileS@nda.agric.za	31 Brown Street Nelspruit 1200
Mpumalanga Department of Agriculture	Frans Mashabela	013 754 0730	013 754 0735	FransMas@nda.agric.za	PO Box 8806 Nelspruit 1200
Mpumalanga Department of Agriculture	Mary Mogale	013 754 0728	086 699 4027	MaryM@daff.gov.za	31 Brown Street Nelspruit 1200
Mpumalanga Department of Mineral Resources	Martha Mokonyane	013 653 0500	013 690 3288 /2390	Martha.mokonyane@dmr.gov.za	Private Bag X7279 Emalahleni 1035
Mpumalanga Department of Water Affairs	Mntambo Fanyana	013 752 2366	013 932 2071	MntambF@dwa.gov.za	Private Bag X10580 Brokhortspruit 1020
Dept of Water Affairs: Mpumalanga Province	Martha Manaka	082 419 8884		manakam@dwa.gov.za	
Dept of Health	Louisa Nyokana			louisa.nyokana@gmail.com	PO Box 5054 Secunda 2302
Dept of Labour	Peter Molapo	013 653 3808		peter.molapo@labour.gov.za	
SALGA Mpumalanga	Derrick Ndlovu	013 759 7300	013 752 5595	dndlovu@salga.org.za	P O Box 1693 Nelspruit 1200
SAHRA Mpumalanga	Mr. Godfrey Tshivhalavhala			gtshivhalavhala@mp.sahra.org.za	
Dipaleseng Local Municipality	Piet Botha	017 773 0055	017 773 1518	dipaleseng@worldonline.co.za	Private Bag X1005 Balfour 2410
Dipaleseng Local	Robbie Hall	082 611	017 773	robbie.keepusall@gmail.com	Private Bag

BASIC ASSESSMENT REPORT

Municipality		1971	0169		X1005 Balfour 2410
Dipaleseng Local Municipality	Patrick Malebye	017 773 2031	086 696 5801	malebyep@dipaleseng.gov.za	Private Bag X1005 Balfour 2410
Dipaleseng Local Municipality	Londiwe Mambatha	017 773 0055	017 773 0169	mambathan@yahoo.com	Private Bag X1005 Balfour 2410
Dipaleseng Local Municipality	JB Maseko	017 773 2031	017 773 0169	susan.mofokeng@yahoo.com	Private Bag X1005 Balfour 2410
Gert Sibande District Municipality	Dan Hlanyane	017 801 7000	017 811 1207	d.hlanyane@gertsibande.gov.za	PO Box 1748 Ermelo 2350
Gert Sibande District Municipality	Tebogo Mogakabe	017 819 2829	086 514 2007	tebogo@envirion1.agric.za	PO Box 2777 Ermelo 2350

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

BASIC ASSESSMENT REPORT

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

Please note: As described in the BAR, the only feasible alternatives are:

- **Alternative site 1;**
- **Alternative 1(S1) = Alternative site 1 + Route F; and**
- **Alternative 1 (S2) = Alternative site 1 + Route D**

Impact	Applicable Alternative	Description of no go alternative (current status quo)	No go (current status quo)	Pre-mitigation	Post-Mitigation
Construction:					
Noise and Dust	All alternatives	From a regional perspective, the power station currently generates noise and dust during its everyday activities. No construction work is taking place on the feasible site at present. The PV facility would not significantly increase these levels during construction	-9	-11.25	-9
Cement mixing during construction	All alternatives	No cement mixing is currently taken place on the site, thus this will be a new impact.	0	-6	-1.5
Power line route layout Alternative 1(S2): Impact on Wetlands	S2	The wetlands are at present degraded but not impacted upon	0	-13	-13
Power line route layout Alternative 1(S1): Impact on Wetlands	S1	The wetlands are at present degraded but not impacted upon	0	-13	-6.5
PV facility Design (Impact on future groundwater)	Alternative site 1	The ADF has, and is likely to continue, impacting on the environment and specifically the quality of the groundwater. The current design will occupy an area of 17ha. Rainwater falling onto the PV arrays will be collected as per the rain water management system as described in section 5.2. The implication of this is that a significant volume of rainwater that historically infiltrated the ADF (and consequently had the potential to pollute	-21	-21	-9.75

BASIC ASSESSMENT REPORT

		ground water), will be collected and discharged away from the ADF. Therefore, ground water quality has been affected historically, but the PV facility will likely have a positive effect on the status quo going forward.			
Habitat loss through site clearance	Alternative site 1	The current site has been impacted upon by historical land use changes. Remnant secondary grassland still exists on the site that will be impacted upon.	-10	-16	-14
Impacts on threatened fauna	Site alternative 1	The current site has been impacted upon by historical land use changes that have negatively affected fauna and flora	-10	-5	-2
Establishment and spread of declared weeds and alien invader plants.	All alternatives	The current site has been impacted upon by historical land use changes that have negatively affected fauna and flora	-10	-9	-2
Topsoil removal and stockpiling	All alternatives	No topsoil stockpiles exist on the site at present, this it would constitute a new impact	0	-10	-2
Heritage resource	All alternatives	No heritage resources exist on site, and none will be affected	0	N/A	N/A
Operational Phase					
Improved economic development (positive impact)	Alternative site 1	The PV facility will improve the current status quo, by increasing employment opportunities. They will be limited and temporary	0	+7	+7
Sense of place impact from PV facility	Alternative site 1	The current sense of place has been affected by the presence of the power station (i.e. the visual resource is already disturbed). The PV Facility will add to the current visual intrusion caused by the power station. This change is however not expected to be significant considering the nature and extent of the existing infrastructure.	-8	-16	-9
Loss of arable land	Alternative site 1	The land on which the PV facility is located not will not be available for arable use. The portion of land located on the ADF (7ha portion) is presently unsuitable for arable use. However the portion of land proposed for the PV facility (10ha portion) that is located off the ADF will not be available in the future.	0	-3	-3
Water use during operation	Alternative site 1	No water use is currently taking place on the site, although the power station does use large quantities water as per their WUL. The PV facility would only require water to clean PV panels and the quantities are insignificant when compared to the overall power station water use.	0	0	0
Impact on future land use	Alternative site 1	The use of a brownfield site for a portion of the PV facility is an improvement in the current status quo, if mitigated	-25	-20	-5
Sense of place impact from ADF end use change	Alternative site 1	The end use change is seen as a positive effect, since the ADF will be converted to a renewable energy generation facility. The facility design will inter alia address some of the	-16	-12	-2

BASIC ASSESSMENT REPORT

		negative aspects typically associated with ADFs, improving the long term usefulness of the ADF in the sense that it provides a suitable development area for renewable energy.	-17.5	-17.5	11.25
Impact of PV facility on the surface and ground water resources during operation	Alternative site 1	The current status quo has polluted ground water resources. The increase in coverage area to collect rain water (in the form of a rain water management system,) will have a positive effect on ground water pollution in the long term. Any increase above the status quo coverage will likely reduce future potential ground water pollution. The assessment was based on a figure of 45% coverage, the actual figure may vary based on the contractor's specification.	-17.5	-17.5	11.25
Impact on storm water quality	Alternative site 1	Storm water emanating from the PV facility panels may periodically become polluted by the power station and other local air pollution sources (e.g. ash, low level domestic burning, etc). Particulates settling on the PV arrays will likely become mobilised during rainfall events. Any additional storm water management mitigations from the DWA from/as part of the WUL process and WUL consultation will be incorporated. Eskom must ensure that the receiving environment is not contaminated by storm water, if it is deemed polluted.	-11	-11	-2.75
Storm water control and treatment	Alternative site 1	The site (both the ADF portion and the non-ADF portion) has insufficient storm water management measures at present. The PV facility will improve this.	-17.5	-17.5	-5
Decommissioning					
Impact on groundwater	Alternative site 1	If the PV facility is decommissioned, and removed, it is possible that ground water will continue to be polluted in future from the historical ADF. The impacts of the decommissioning should be re-investigated and the hydrogeological model updated prior to decommissioning, to predict the extent of the potential impact and consequently mitigate this where necessary.	-17.5	0	0
Impact on future land use	Alternative site 1	The PV facility construction will have a positive impact on future land use on the ADF. Decommissioning will revert the land to its current undesirable state.	-25	0	0
Improved economic development (positive impact)	Alternative site 1	The PV facility will improve the current status quo, by creating limited employment opportunities and providing renewable energy. Decommissioning would remove this positive impact.	0	0	0

Please refer to Appendix F, for the complete impact description.

BASIC ASSESSMENT REPORT

As can be seen from the table above, the power line route layout alternatives (S1 & S2) will have identical impacts except for impacts on wetlands. Alternative site 1's impact is mostly restricted to impacts on ground water, storm water control, sense of place change and land use change. The overall preferred alternative is thus Alternative 1 (S1) (Route F).

The proposed power line (Route F) impact would not be significant since the impact would be restricted to the construction phase, during excavation. The steel monopole pylons chosen for the design will allow the spans to be between 80m and 200m in length allow greater flexibility to reduce the impact on wetlands. The exact tower positions were not available at the time of this assessment, however the proposed location of the powerline was assessed as a corridor. All the relevant technical information will be included in the Water Use Licence application.

BASIC ASSESSMENT REPORT

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Based on the findings of the impact assessment, all impacts identified specific to the proposed construction and operation of the PV facility and associated infrastructure were considered, after applying the recommended mitigation measures. Alternative site 1, including Alternative S1 or S2, are the only feasible site alternative for the proposed development. By utilising the ADF surface and reducing rainfall infiltration into the body of the ADF, a positive effect on ground water quality will likely be created in the future. The most significant impacts (post mitigation) associated with the proposed PV facility are:

- Potential positive impact on ground water quality ;
- Potential Negative habitat loss through clearing;
- Potential Negative Sense of place impacts in relation to the existing powerstation (if not mitigated);

Any Negative impacts can be reduced to acceptable levels through the proposed mitigation measures.

The two power line route alternatives will have a similar impact, except for the impact on wetland vegetation, due to their proposed alignments. **The Preferred alternative is thus Alternative S1**, which closely follows existing disturbed areas and servitudes. Alternative S2 is a shorter route, but will have a greater impact on wetland vegetation removal. The power line will require a separate Water Use Licence for its construction.

Based on the fact that numerous alternative options were considered and specialist input obtained on all aspects of the development, the EAP would recommend that the project be approved. This decision is also motivated by the current disturbed nature of the Grootvlei site.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES ✓

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

All the management and mitigation measures listed Appendix F and the EMPr, must be implemented.

Is an EMPr attached?

YES ✓

Please refer to Appendix G for the EMPr.

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

FN DURIEUX

NAME OF EAP

BASIC ASSESSMENT REPORT



22/01/2014

SIGNATURE OF EAP

DATE

BASIC ASSESSMENT REPORT

SECTION F: APPENDICES

The following appendixes must be attached:

Appendix A: Maps	Attached ✓
Appendix B: Photographs	✓
Appendix C: Facility illustration(s)	✓
Appendix D: Specialist reports (including terms of reference)	✓
Appendix E: Public Participation	✓
Appendix F: Impact Assessment	✓
Appendix G: Environmental Management Programme (EMPr)	✓
Appendix H: Details of EAP and expertise	✓
Appendix I: Specialist's declaration of interest	✓
Appendix J-: Power line Route Coordinates	✓
Appendix J-1: Rain water catchment system conceptual layout	✓
Appendix J-2: DWA correspondence on Closure/decommission	✓
Appendix J-3: Eskom DEA presentation on NEMWA licencing requirement.	✓
Appendix J-4: DEA response on NEMWA licencing requirements	✓

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix E1: Public Participation – Issues and Response Report

BASIC ASSESSMENT REPORT

Appendix E2: Public Participation – Copy of correspondence sent to I&APs

BASIC ASSESSMENT REPORT

Appendix E3: Public Participation – Copy of correspondence received by I&APs

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

BASIC ASSESSMENT REPORT

Appendix J: Powerline Routes & Coordinates

Appendix J-1: Rain water catchment system conceptual layout

Appendix J-2: DWA correspondence on NEMWA licencing requirements

Appendix J-3: Eskom DEA presentation on NEMWA licencing requirements

Appendix J-4: DEA response on closure requirement