

ENVIRONMENTAL IMPACT ASSESSMENT: PROPOSED PHOTOVOLTAIC ENERGY PLANT ON FARM HOEKPLAAS NEAR COPPERTON, NORTHERN CAPE



NOVEMBER 2011
DEA REF. NO. 12/12/20/2503
NEAS REF. NO. DEAT/EIA/0000605/2011



SUMMARY DOCUMENT: DRAFT SCOPING REPORT

Background

Mulilo Renewable Energy (Pty) Ltd (Mulilo) proposes to construct a photovoltaic (PV) solar energy plant on a farm, near Copperton in the Northern Cape. Aurecon South Africa (Pty) Ltd (Aurecon) has been appointed to undertake the requisite environmental process as required in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA), as amended, on behalf of Mulilo.

The proposed project would take place on the farm Hoekplaas (Remainder of Farm No. 146) near Copperton in the Northern Cape (see **Figure 1**). The site lies approximately 7.8 km to the south of Copperton and borders to the Kronos substation.

Proposed project

Mulilo proposes to construct a PV solar energy plant to generate approximately 100 MW (preferred alternative) or 150 MW (alternative) on the farm Hoekplaas (Farm 146/RE) near Copperton in the Northern Cape. The proposed PV plant would cover an area of approximately 300 ha (preferred alternative) or 450 ha (alternative), which is currently used for grazing.

In terms of associated infrastructures, the following would be required:

- Upgrade of existing internal farm roads and construction of new roads to accommodate the construction vehicles and access the site.
- Construction of a 132 kV transmission line, approximately 1.64 km in length, to connect the proposed PV plant with Eskom's grid via the Cuprum substation.
- Electrical fence to prevent illegal trespassing, as well as keeping livestock from roaming between the solar arrays and causing accidental damage.
- Other.

The proposed PV plant would convert shortwave radiation (sunlight) directly into electricity via cells through a process known as the PV Effect. The PV cells are made of silicone which acts as a semi-conductor. The cells absorb light energy which energises the electrons to produce electricity. Individual solar cells can be connected and packed into standard modules behind a glass sheet to protect the cells from

Purpose of this document

This document provides a summary of the Draft Scoping Report (DSR) and Plan of Study for EIA for the proposed PV plant on Hoekplaas near Copperton, Northern Cape. It provides a brief background and overview of the proposed project, the list of project alternatives and potential impacts (together with proposed specialist studies where applicable) that are proposed to be investigated further in the EIA phase.

You are invited to comment on the Draft Scoping Report (DSR) for the proposed development. The DSR has been lodged at the Prieska (Elizabeth Vermeulen) Public Library, Ietznietz Guest House in Copperton and on the Aurecon website (www.aurecongroup.com) - indicate "Current Location" as "South Africa" and follow the Public Participation link).

Please review this Summary Document and, preferably, the full Scoping Report, and submit your comments on the proposed project by **Thursday, 5 January 2012**. To comment, write a letter, call or e-mail the Public Participation office.

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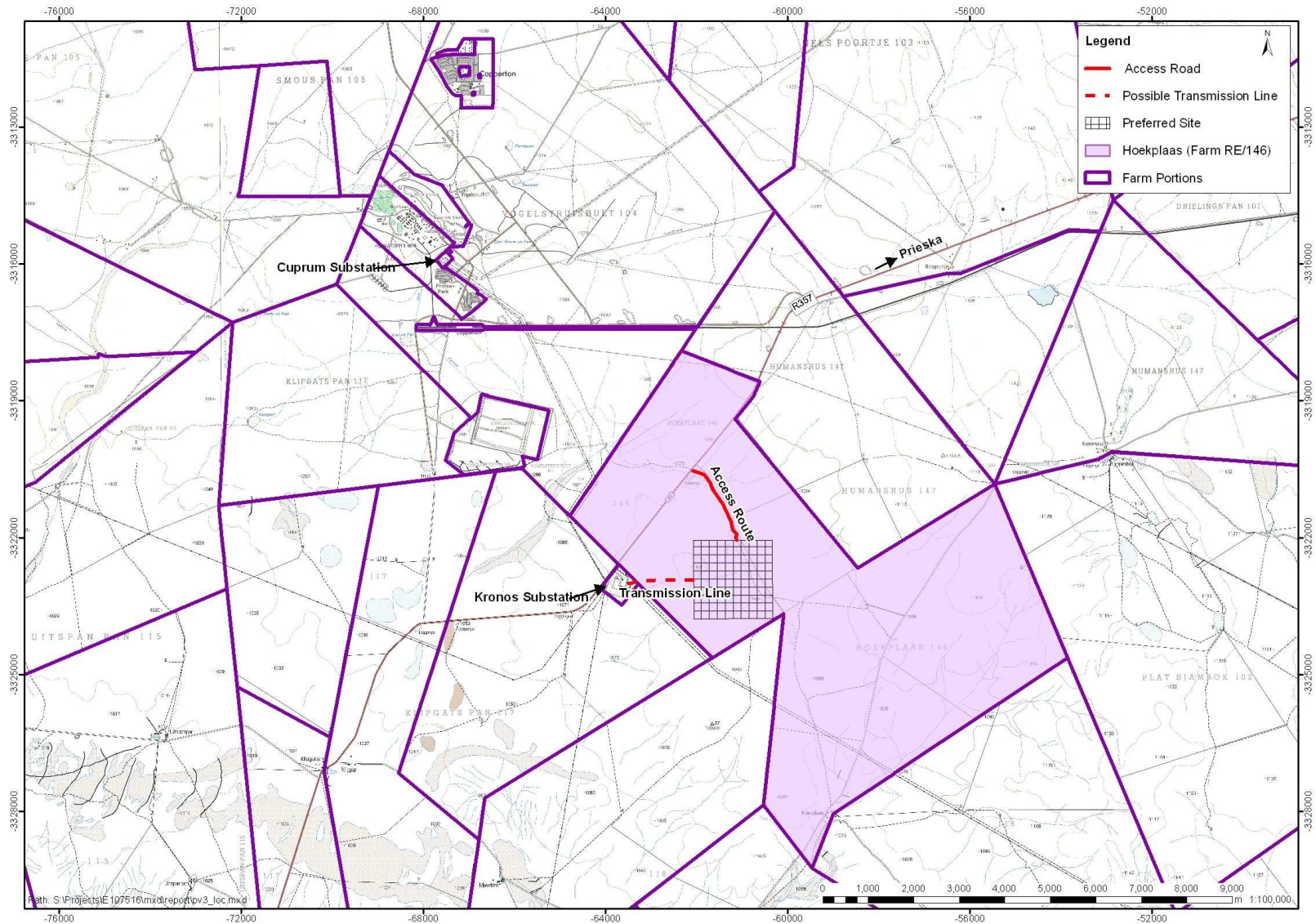


Figure 1 Location of the proposed PV plant on the farm Hoekplaas near Copperton, Northern Cape (2922 CD)

the environment while obtaining desired currents and voltages. These modules are grouped together to form a panel and can last up to 30 years due to the immobility of parts, as well as the sturdiness of the structure.

Grid-connected PV Power Systems (PVPS) are made up of a variety of components, which aside from the PV modules, include conductors, fuses, disconnect controls, trackers, and power conditioning units (i.e. inverters). The PVPS requires transmission infrastructure to feed electricity into the grid, unlike the Stand-alone PV Power System that requires batteries to store electricity for use later. The electricity is generated from solar energy which is transformed by the PV modules (arranged in arrays). The maximum power point tracker (MPPT) ensures that power coming from the PVs are maximised by determining the current that the inverter should draw from the PV panel. The inverter converts the direct current (DC) to an alternating current (AC) to allow the electricity to be fed into the grid. **Figure 2** below illustrates the components of the process of generating electricity from solar energy (sun) and fed into the grid.

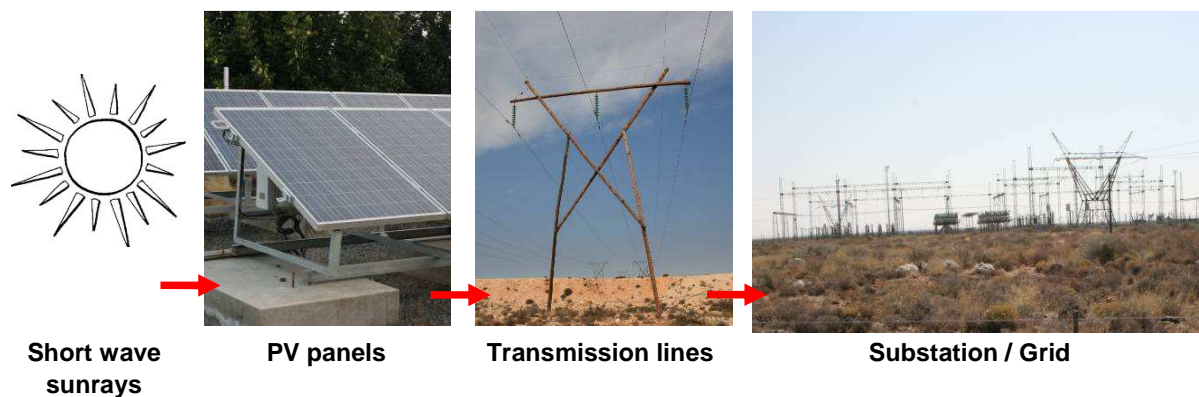


Figure 2 Basic PV system layout

Construction phase

The proposed facility would be constructed over a period between 18 and 30 months. During the Construction Phase between 200 and 900 individuals would be employed depending on the procurement method used as well as the primary contractor. If non-locals are employed they would be housed in temporary dwellings on site or in accommodation within Copperton and Prieska.

Operational phase

The project is expected to last the full period of the Power Purchase Agreement which is approximately 20 years. Regular cleaning of the panels to remove dust, dirt, pollen, and bird excretions would be required to ensure that the maximum quantity of sunrays can be captured by the PV panels. The frequency of panel cleaning would depend on the site conditions. Panels would be washed with water and a mild, organic, and non-abrasive detergent.

Decommissioning phase

The PV site would be decommissioned at the end of the Power Purchase Agreement (20 years from the date of commissioning). The decommissioning is expected to take between 6 to 12 months. The module components would be removed and recycled as the silicon and aluminum can be re-used in the production of new modules.

Site description

The site consists of the farm Hoekplaas (Farm 146/RE). This portion is privately owned by Mr H.G. Human and Mrs M.J. Human who has entered into a long term agreement with Mulilo for the proposed project. Hoekplaas lies approximately 7.8 km to the south of Copperton and borders to the Kronos substation. The farm is approximately 5 014 ha in size and split into two portions by the R357.

The surrounding land uses are mainly agricultural, consisting mostly of sheep grazing. At the abandoned Copperton mine a PV power generation facility is proposed by Mulilo and recently received an Environmental Authorisation (DEA Ref. No. 12/12/20/1722). Further west of the site is Alkantpan, a weapons testing range, used by many countries for weapons testing. Other proposed activities in the area include a wind energy facility to the east proposed by Plan 8 (Pty) Ltd (DEA Ref. No. 12/12/20/2099), two PV plants to the west and north of the site on farms Klipgats Pan (DEA Ref. No. 12/12/20/2501) and Struisbult (DEA Ref. No.12/12/20/2502) and wind and solar energy facilities proposed by Mainstream Renewable Energy (Pty) Ltd (DEA Ref. No. 12/12/20/2320/1 and 12/12/20/2320/2) on three of the adjacent farms (Farms 102/RE, 118/1 and 118/3) to the east, south and west. Please refer to **Figure 3** for map showing the locations of the above mentioned renewable energy projects.

A 1.7 km airstrip (owned by the Alkantpan weapon testing facility) is also located to the north of the site and is used by a number of aeroclubs (e.g. Aeroclub SA). Copperton town, consisting of a few dwellings and a small shop is also located immediately west of the site. It is proposed to move this airstrip approximately 7 km east of its current location as part of the Plan 8 wind energy facility. The site itself is used for agriculture (grazing).

Scoping Process in terms of EIA Regulations

EIA Regulations (Government Notice (GN) No. 544, 545 and 546) promulgated in terms of NEMA, identify certain activities, which “could have a substantial detrimental effect on the environment”. These listed activities require environmental authorisation from the competent environmental authority, i.e. the Department of Environmental Affairs (DEA) in the case of energy applications, prior to commencing.

This proposed project triggers a number of listed activities (see **Table Error! No text of specified style in document..1**) in terms of NEMA and accordingly requires environmental authorisation from DEA via the EIA process outlined in GN. No 543 of NEMA.

Table Error! No text of specified style in document..1 Listed activities in terms of NEMA GN No. 544, 545 and 546, 18 June 2010, to be authorised for the proposed wind energy facility

NO.	LISTED ACTIVITY
GN No. R544, 18 June 2010	
10	The construction of facilities or infrastructure for the transmission and distribution of electricity - <ul style="list-style-type: none"> • outside urban areas or industrial complexes with a capacity of more than 33 , but less than 275 kilovolts; or • inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
GN No. R545, 18 June 2010	
1	The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.
GN No. R546, 18 June 2010	
14	The clearance of an area of 5 hectares or more of vegetation where 75 % or more of the vegetation cover constitutes indigenous vegetation <ul style="list-style-type: none"> (a) in the Northern Cape (i) All areas outside urban areas.

Aurecon has been appointed to undertake the required environmental processes on Mulilo's behalf.

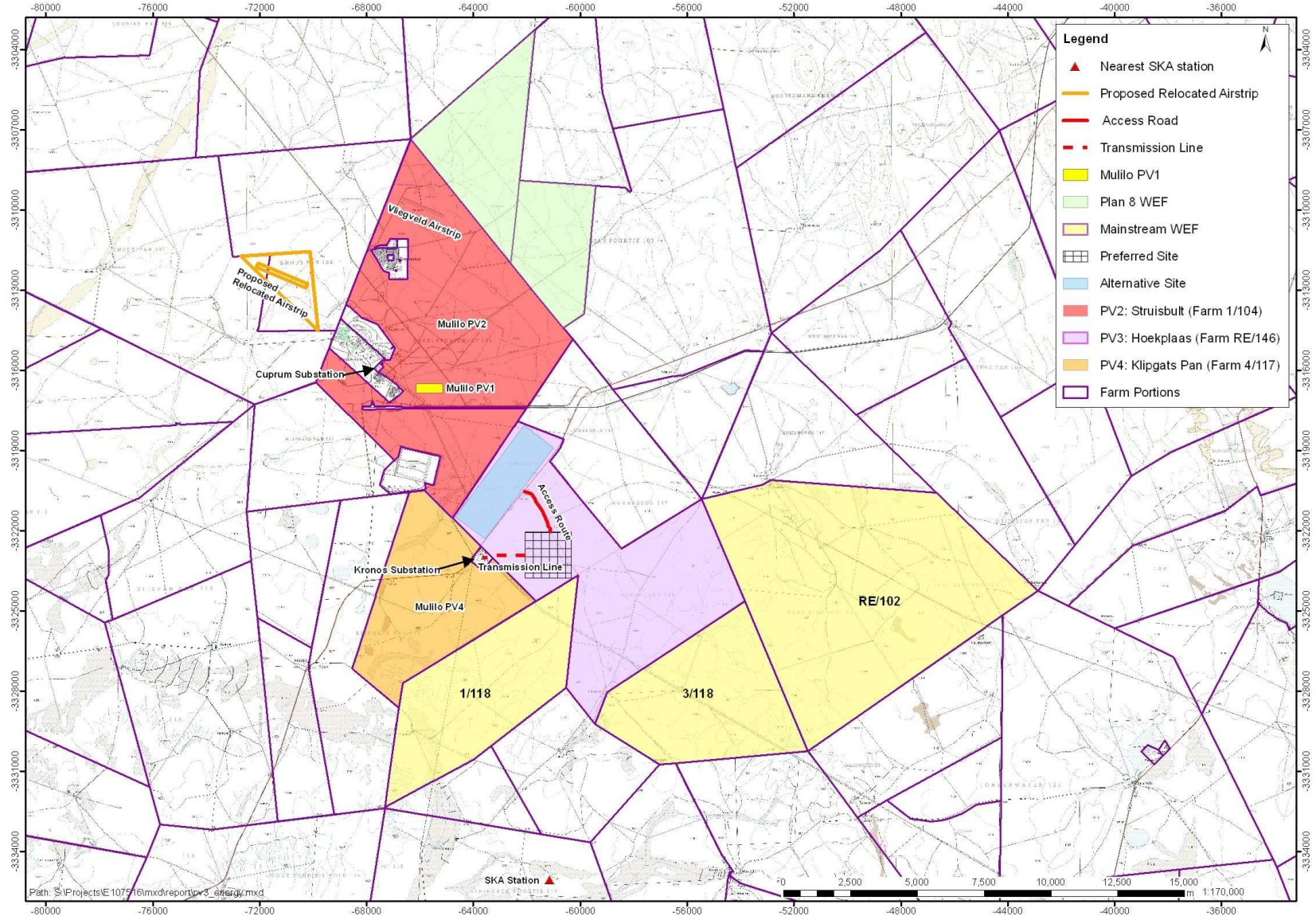


Figure 3 Other renewable energy projects (solar and wind) proposed for the Copperton area

EIA Process

The EIA process consists of an Initial Application Phase, a Scoping Phase and an EIA Phase. The purpose of the Initial Application Phase is to commence the project *via* the submission of the relevant department's application forms. The purpose of the Scoping Phase is to identify and describe potential positive and negative environmental impacts, (both biophysical and socio-economic), associated with the proposed project and to screen feasible alternatives to consider in further detail.

The purpose of the EIA Phase is to comprehensively investigate and assess those alternatives and impacts identified in the Scoping Report and propose mitigation to minimise negative impacts.

The acceptance of the Scoping Report and the Plan of Study for EIA by DEA would allow the process to continue to the EIA Phase.

Project alternatives

The following feasible alternatives have been identified for further consideration in the Environmental Impact Assessment Report (EIAR):

- **Location alternatives:**
 - One location for the proposed Hoekplaas PV plant; and
 - Electricity distribution via a 1.64 km 132 kV connection to Cuprum substation.
- **Activity alternatives:**
 - Solar energy generation via a PV plant; and
 - “No-go” alternative to solar energy production.
- **Site layout alternatives:**
 - Two layout alternatives (100 MW with 300 ha footprint and 150 MW with 450 ha footprint).
- **Technology alternatives:**
 - One technology alternative in terms of the solar panel type (PV);
 - Single or Dual or Concentrated Dual axis tracking systems to mount the panels; and
 - Four foundation options.

Identified impacts

The proposed PV plant could impact on a range of biophysical and socio-economic aspects of the environment. Impacts can result from the construction phase as well as the operational phase. While the construction phase impacts are usually short term, some may have longer lasting effects. A construction phase Environmental Management Programme (EMP) will be compiled to be implemented during the construction phase to manage these aspects.

The operational phase impacts are usually considered to be the long term impacts associated with the project and these will be considered by a suite of specialists during the Environmental Impact Assessment Report (EIAR) Phase. The specialists will also consider ways to manage these potential impacts and these mitigation measures will be included in an operational phase EMP.

Specifically the following potential environmental impacts have been identified for further consideration in the EIAR:

- Operational phase impacts on the biophysical environment:
 - Impact on flora;
 - Impact on fauna (including avifauna); and
 - Impact on freshwater resources.
- Operational phase impacts on the socio-economic environment:
 - Impact on heritage resources (including palaeontology);

- Visual impacts;
- Impact on energy production;
- Impact on local economy (employment) and social conditions;
- Impact on agricultural land; and
- Impact on surrounding land uses.
- Construction phase impacts on the biophysical and socio-economic environments:
 - Disturbance of flora and fauna;
 - Sedimentation and erosion of water ways;
 - Impact on traffic;
 - Storage of hazardous substances on site;
 - Noise pollution; and
 - Dust impact.

The following specialist studies and specialists will be commissioned to provide more detailed information on those environmental impacts which have been identified as potentially being of most concern, and/or where insufficient information is available, namely:

Study	Consultant and Organisation
Botanical assessment	Dr Dave MacDonald of Bergwind Botanical Tours and Surveys
Agriculture potential assessment	Mr Kurt Barichiev of SiVEST
Aquatic assessment	Mr James Mackenzie of Mackenzie Ecological & Development Services
Hydrology	Mr Richard Hirst of SiVEST
Avifauna assessment	Dr Andrew Jenkins of Avisense Consulting
Heritage Impact Assessment	Mr Jayson Orton of ACO
Archaeology	
Cultural heritage	
Palaeontology	Dr John Almond of Natura Viva
Visual Impact Assessment	Mrs Karen Hansen

Public Participation

Public participation is a key component of this EIA process and will take place at various stages throughout the project. The approach adopted for the current investigation was to identify as many I&APs as possible initially, through a suite of activities, as follows:

- Placing advertisements in local newspapers on 2 November 2011 (the Gemsbok);
- Placing a notice board at the site (8 November 2011);
- Providing written notice and an Executive Summary to potential I&APs, including surrounding landowners, organs of state, ward councillors and relevant authorities (8 November 2011);
- Informing I&APs registered for existing projects in the area on which Aurecon is involved with about the project and providing them with an opportunity to register for this project as well; and
- Requesting potential I&APs to recommend other potential I&APs to include on the database (chain referral process).

Way forward

All registered I&APs were notified of the meetings by means of a letter sent by post, fax or e-mail on 4 November 2011. The notification letters also included a copy of the Executive Summary of the DSR in English and Afrikaans. Copies of this DSR have been lodged in Prieska (Elizabeth Vermeulen) Public Library, letznietz in Copperton and on the Aurecon website (www.aurecongroup.com) - indicate "Current Location" as "South Africa" and follow the Public Participation link).

I&APs have 40 days, **8 November 2011** until **5 January 2011**, to submit their written comments on the DSR. Cognisance will be taken of all comments in compiling the final report, and the comments, together

with the project team and proponent's responses thereto, will be included in the final report. Where appropriate, the report will be updated.

Once the Final Scoping Report has been completed and all I&AP comments have been incorporated into the report, and the client has approved the report, it will be submitted to DEA and the Northern Cape Department of Environmental Affairs and Nature Conservation for their review and comment, respectively. DEA will either reject the application or instruct the applicant to proceed to the EIA Phase, either as proposed in the Plan of Study for EIAR, or direct that amendments are made before continuing.

Public Participation Office

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List of Acronyms

DEA	Department of Environmental Affairs
DSR	Draft Scoping Report
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
ha	Hectare
I&AP	Interested and Affected Party
km	Kilometer
kV	Kilovolt
MW	Megawatts
NEMA	National Environmental Management Act