Proposed Dobbin 75 MW Photovoltaic Solar Facility, Cradock, Eastern Cape

Final Scoping Report

Report Prepared for

AF-ROM Energy (Pty) Ltd

Report Number 444715/5

DEA Reference Number: 14/12/16/3/3/2/333

Report Prepared by

srk consulting

June 2012

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SRK Project Number 444715

June 2012

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List of Abbreviations

BID	Background Information Document
CBA	Critical Biodiversity Areas
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DWA	Department of Water Affairs
DEA	Department of Environmental Affairs (National)
DMR	Department of Mineral Resources
DSR	Draft Scoping Report
EIA	Environmental Impact Assessment
FSR	Final Scoping Report
IAPs	Interested and Affected Parties
NEMA	National Environmental Management Act
PV	Photovoltaic
PPP	Public Participation Process
SAHRA	South African Heritage Resource Agency
SRK	SRK Consulting
ToR	Terms of Reference
PV	Photovoltaic
+ve	Positive
-ve	Negative

Glossary of Terms

Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action.
Indigenous vegetation	Vegetation consisting of indigenous plant species occurring naturally in an area, regardless the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Interested and Affected Party	Any person. group of persons or organisation interested in or affected by an activity, and any Organ of State that may have jurisdiction over any aspect covered by the activity.

Plan of Study for EIA	A document which forms part of a Scoping Report and sets out how an Environmental Impact Assessment must be conducted.
Registered Interested and Affected Party (IAP)	An Interested and Affected Party whose name is recorded in the register opened for the application / project.
Scoping	A procedure to consult with stakeholders to determine issues and concerns and for determining the extent of and approach to an EIA, used to focus the EIA
Scoping Report	A written report describing the issues identified to date for inclusion in an EIA
Photovoltaic	Semi-conductor materials such as monocrystalline or polycrystalline silicon, cadmium telluride and copper indium present in solar panels that generate electricity by converting solar radiation into direct electrical current

1 Background and Introduction

1.1 Background of the project

AF-Rom Energy (Pty) Ltd proposes to develop a 75 MW Solar Facility in the Inxuba Yethemba Local Municipality, in the Eastern Cape. The proposed development will be located on Portion 1 of Farm Het Fortuin No. 66, approximately 30 km north-west of Cradock, adjacent to the exiting Dobbin substation (see Figure 1-1).

SRK Consulting has been appointed by AF-Rom Energy (Pty) Ltd, as the independent consultants to assess the environmental impacts in terms of NEMA, as amended, and the EIA Regulations, 2010, for the proposed 75 MW Dobbin Solar Facility.

In terms of the National Environmental Management Act 107 of 1998 (NEMA), as amended, and the Environmental Impact Assessment (EIA) Regulations, 2010, an environmental assessment process must be undertaken for certain listed activities. The main activity associated with the Facility is listed under GNR 545 of 18 June 2010 and as such requires a full Scoping and Environmental Impact Assessment (S&EIA). Notwithstanding this, an application was submitted, in terms of Section 20(4) of Government Gazette No. 543, to conduct a Basic Assessment process instead of a S&EIA, and a Draft Basic Assessment Report was distributed for public comment. DEA has subsequently turned down the application for downscaling to a Basic Assessment process, and hence the prescribed Scoping and EIA process is being followed. .

The Scoping Study includes a Public Participation Process (PPP), aimed at identifying issues and concerns of Interested and Affected Parties (IAPs). The objective of the Scoping Study is to identify those issues and concerns that must be investigated in more detail, and which will be reported in a subsequent Environmental Impact Report (EIR). The Final Scoping Report (FSR) presents the findings of the Scoping Study, and offers an opportunity for key stakeholders and IAPs to review the issues identified, and to make any further comments.

1.1.1 Applicant Details

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1.1.2 Environmental Assessment Practitioner Details

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An EIA application form was submitted to the National Department of Environmental Affairs (DEA) in January 2012. A copy of the Department's acknowledgement of receipt of the EIA application form is attached as Appendix A of this report. A signed copy of the EAP declaration of interest is attached as Appendix H.

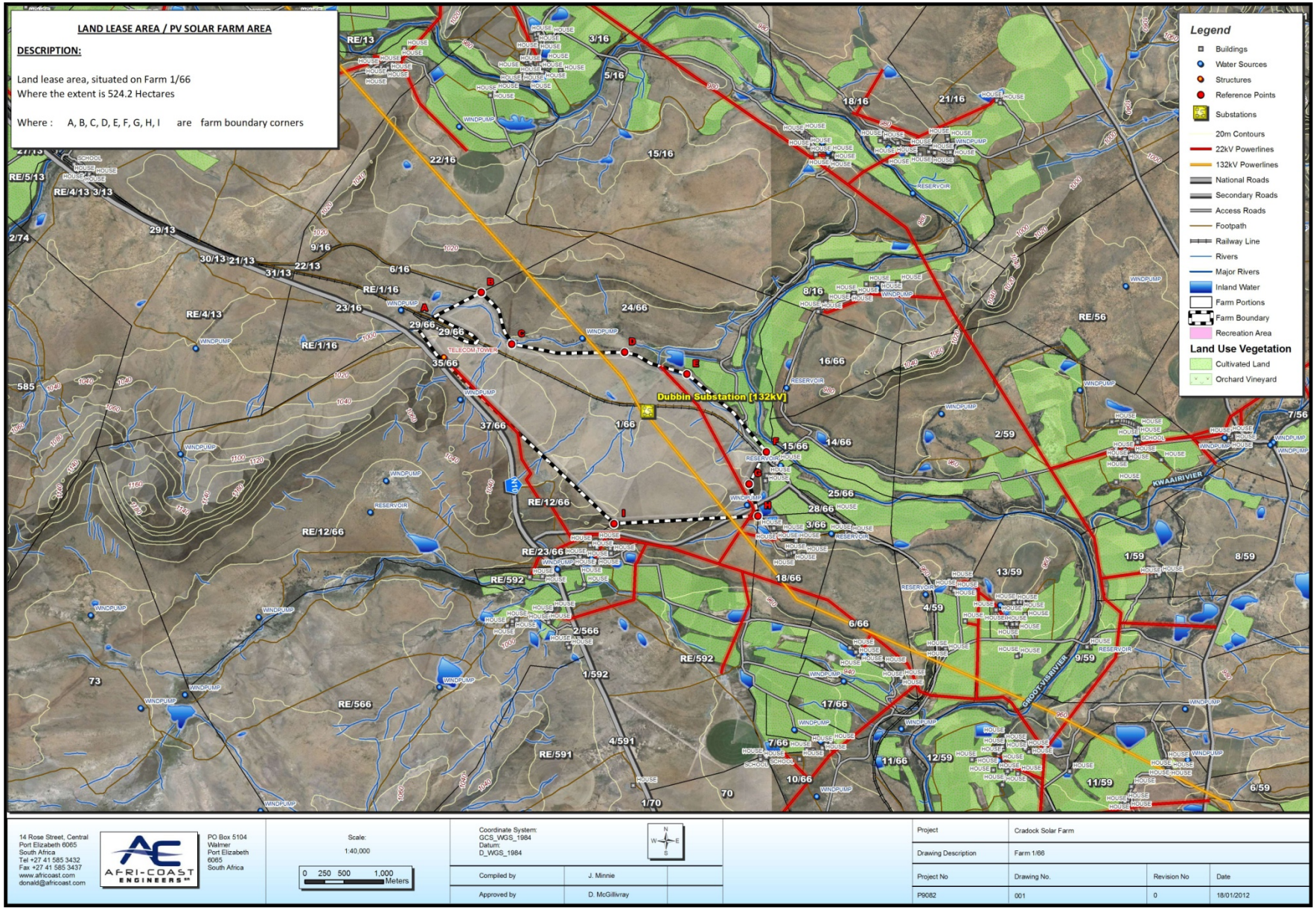


Figure 1-1: Site Locality Plan

1.2 SRK Profile and Expertise of Relevant Environmental Assessment Practitioners (EAP's)

SRK has been appointed by the AF-ROM Energy as the independent consultants to undertake the EIA Process required in terms of applicable legislation.

SRK Consulting comprises over 1000 professional staff worldwide, offering expertise in a wide range of environmental and engineering disciplines. SRK's Port Elizabeth environmental department has a distinguished track record of managing large environmental and engineering projects and has been practicing in the Eastern Cape since 2001. SRK has rigorous quality assurance standards and is ISO 9001 certified.

Environmental Assessment Practitioner: Project coordinator (Tammy Arthur BSc Hons.)

Tammy Arthur is an Environmental Scientist, with over 2 years experience in Basic Assessments (BA's), Environmental Management Programmes (EMPr's) and Environmental Control Officer (ECO) work, as well as report writing. Her training is in Botany and Geography and she has a sound knowledge in Conservation Biology.

Environmental Assessment Practitioner: Internal Reviewer: (Rob Gardiner, MSc, MBA, Pr Sci Nat)

Rob Gardiner is the Principal Environmental Scientist and head of SRK's Environmental Department in Port Elizabeth. He has more than 17 years environmental consulting experience covering a broad range of projects, including Environmental Impact Assessments (EIA), Environmental Management Systems (EMS), Environmental Management Programmes (EMPr), and environmental auditing. His experience in the development, manufacturing, mining and public sectors has been gained in projects within South Africa, Lesotho, Botswana, Angola and

Box 1: Environmental Assessment Practitioner expertise

1.3 Statement of SRK Independence

Neither SRK nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of SRK.

SRK's fee for completing this Report is based on its normal professional daily rates plus reimbursement of incidental expenses. The payment of that professional fee is not contingent upon the outcome of the Report.

As required by the legislation, SRK has completed and submitted a declaration of interest, as part of the EIA application form. A copy of this is included in the EIA application in Appendix A and the qualifications and experience of the individual practitioners responsible for this project are detailed in Box 1 above.

1.4 Assessment of the Scoping Report

Before proceeding to the EIA phase, the Scoping Report and Plan of Study for EIA are assessed by the Department Environmental Affairs (DEA).

In the spirit of cooperative governance, DEA will consult with other relevant organs of state before making a decision. These organs of state could include:

- Department of Agriculture, Forestry and Fisheries (DAFF);
- Eastern Cape Department of Agriculture;

- National Energy Regulator of South Africa;
- Eastern Cape Department of Economic Development, Environmental Affairs and Tourism;
- Eastern Cape Department of Mineral Energy;
- Eastern Cape Department of Mineral Resources (DMR);
- Eastern Cape Department of Water Affairs (DWA);
- South African Heritage Resources Agency (SAHRA);
- Eastern Cape Provincial Heritage Authority;
- South African Petroleum Agency;
- Inxuba Yethemba Local Municipality; and
- Chris Hani District Municipality.

SRK has distributed Background Information Documents (BIDs) to all the organs of state listed above, and will also give them an opportunity to comment on this report (by distributing the Executive Summary).

1.5 Legal Requirements Pertaining to the Proposed Project

The environmental legislation which is applicable to the authorisation of the proposed project is summarised in this section.

1.5.1 National Environmental Management Act (Act No. 107 of 1998) (NEMA)

NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of the State, as well as to provide for matters connected therewith. Section 2 of NEMA establishes a set of principles that apply to the activities of all organs of state that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised; and
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its life cycle.

Section 28(1) states that:

"Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring."

If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution; and
- Remedying the effects of the pollution.

Legal requirements for this project

AF_ROM Energy has a responsibility to ensure that the proposed housing development construction activities and the EIA process conform to the principles of NEMA. The proponent is obliged to take action to prevent pollution or degradation of the environment in terms of Section 28 of NEMA.

1.5.2 NEMA EIA Regulations

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities that may not commence without an environmental authorisation or existing activities in respect of which an application for environmental authorisation is required. In this context, EIA Regulations contained in four General Notices in terms of NEMA (GN R 543, 544, 545 and 546) came into force on 18 June 2011.

GN R 543 lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a Basic Assessment process or a Scoping and EIA process is required to obtain environmental authorisation. GN R 544 lists activities that require Basic Assessment, while GN R 545 lists activities that require Scoping and EIA. The regulations for both alternative processes stipulate that:

- Public participation must be undertaken at various stages of the assessment process;
- The assessment must be conducted by an independent Environmental Assessment Practitioner;
- The relevant authorities respond to applications and submissions within stipulated time frames; and
- Decisions taken by the authorities can be appealed by the proponent or any other interested and affected party.

The following listed activities, identified in GN R 544 as requiring a Basic Assessment are triggered by the proposed development:

> *10.(i) The construction of facilities or infrastructure for the transmission and distribution of electricity- outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts....*

The following listed activity, identified in GN R 545 as requiring an Environmental Impact Assessment, are triggered by the proposed development:

> *GNR 545 (1) The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.*
>
> and
>
> *GNR 545 (15) Physical alteration of undeveloped vacant or derelict land for residential retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.*

Legal requirements for this project

The proposed solar energy facility triggers activities listed in terms of GN R 544 and GN R 545, and as such the proponent is obliged to conduct an Environmental Impact Assessment for the proposed activity in accordance with the procedure stipulated in GN R 543.

1.5.3 National Heritage Resources Act No. 25, 1999

The protection and management of South Africa's heritage resources is controlled by the National Heritage Resources Act 25 of 1999. The enforcing authority for this act is the South African Heritage Resources Agency (SAHRA).

In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of Section 38 of the National Heritage Resources Act, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of development are proposed. The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required.

The Act requires that:

> *"…any person who intends to undertake a development categorised as the ... or any development or other activity which will change the character of a site exceeding 5 000 m² in extent or involving three or more existing erven or subdivisions thereof must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development..."*

Legal requirements for this project

Due to the extent of the proposed development, the potential impacts on heritage resources must be assessed. Based on the results of the Scoping Study, it is proposed to conduct Phase 1 Archaeological and Palaeontological Impact Assessments as part of the EIA.

1.6 Approach to the Scoping Study

The approach taken in this study is guided by the principles of Integrated Environmental Management (IEM) as described in the IEM guidelines published by the Department of Environmental Affairs and Tourism in 1992 (now known as the Department of Environmental Affairs). The approach is therefore guided by the principles of transparency which is aimed at encouraging decision-making. The underpinning principles of IEM are:

- Informed decision making;
- Accountability for information on which decisions are made;
- A broad interpretation of the term "environment";
- Consultation with IAPs;
- Due consideration of feasible alternatives;
- An attempt to mitigate negative impacts and enhance positive impacts associated with the proposed project;
- An attempt to ensure that the social costs of the development proposals are outweighed by the social benefits;
- Regard for individual rights and obligations;
- Compliance with these principles during all stages of the planning, implementation, and decommissioning of the proposed development or activity; and
- Opportunities for public and specialist input in the decision-making process.

The study has also been guided by the requirements of the EIA Regulations set out in terms of the National Environmental Management Act (NEMA).

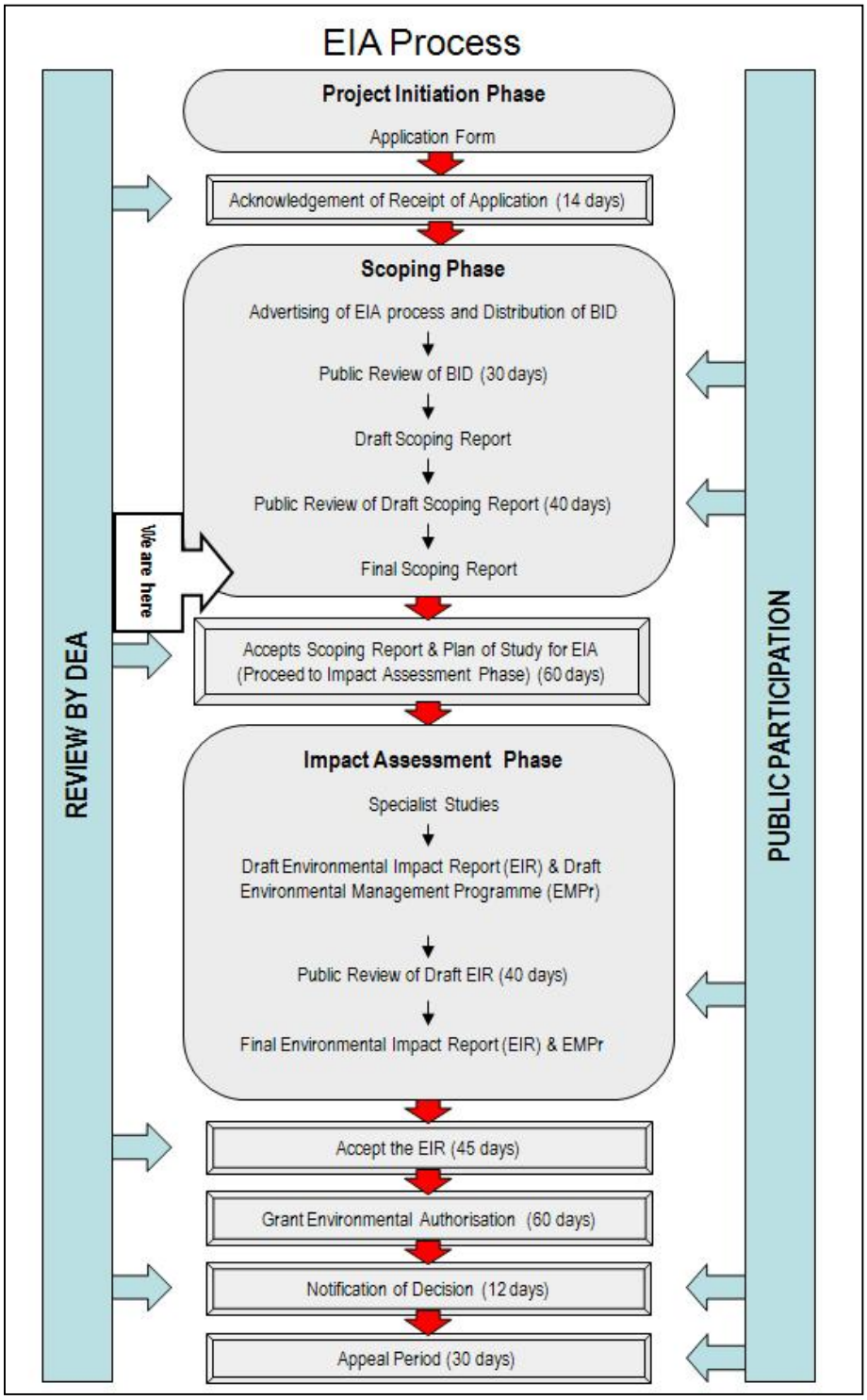


Figure 1-2: Environmental Impact Assessment (EIA) Process

The EIA process consists of two phases, as depicted in Figure 1-2 above. The overall aim of the Scoping Phase is to determine whether there are environmental issues and impacts that require further investigation in the detailed EIA. More specifically, the objectives of the Scoping Phase for this EIA are to:

- Develop a common understanding of the proposed project with the authorities and IAPs;
- Identify stakeholders and notify them of the proposed activity and processes;
- Provide stakeholders with the opportunity to participate in the process and identify issues and concerns associated with the proposed activity;

- Identify potential environmental impacts that will require further study in the impact assessment phase of the EIA process; and
- Develop terms of reference for any studies that will be conducted in the impact assessment phase.

The activities that have been conducted to date as part of this Scoping Study are as follows:

- Advertising of the EIA process in The Cradock Messenger on 13 February 2012 and Die Burger on 20 February 2012 (see copies of advertisements in Appendix B);
- Placement of on-site posters - one at the main entrance and boundary fence of the site (See photographs of the posters in Appendix B);
- Distribution of the Background Information Document (BID) to surrounding land owners and other potential Interested and Affected Parties (IAPs). A copy of the BID is attached in Appendix C, and the table of registered and notified IAPs is given in Table 4-1 in Section 4 below;
- Recording of all issues raised in response to the BID. A summary of the issues raised and responses are presented in Table 4-2 and original correspondence in Appendix D;
- Inclusion of issues raised in response to the BID in the Draft Scoping Report (DSR);
- Preparation of a Draft Scoping Report;
- Distribution of the Draft Scoping Report to public venues for review by IAPs;
- Distribution of an Executive Summary to all IAPs registered for this project;
- Compilation of issues raised in response to the Draft Scoping Report and integration of these comments into the Final Scoping Report (this report);
- Distribution of the Final Scoping Report to public venues for review by IAPs, and distribution of an executive summary to all IAPs registered for this project; and
- Submission of the Final Scoping Report (FSR) and the Plan of Study for the EIA to DEA for consideration and approval. Once approved, the EIA process can proceed to the detailed Impact Assessment phase.

1.7 Purpose of this Final Scoping Report

The Scoping process is aimed at identifying the issues and/or impacts that may result from the proposed activities in order to inform the Impact Assessment phase of the EIA process. The FSR will form the basis of the Terms of Reference (TOR) for specialist studies, and it is therefore important that all issues and potential impacts that may be associated with the proposed development be identified and recorded.

The EIA process thus far has focussed on developing a more detailed description of the development proposal (which is expanded on in Section 2), and on identifying the potential impacts and issues and concerns of Stakeholders and IAPs.

IAPs are encouraged to review the FSR to ensure that their comments have been accurately recorded and understood. Further comments received will be included in the Draft Environmental Impacts Report.

1.8 Assumptions and Limitations

The following assumptions have been made during the Scoping Study and in the compilation of this document:

- That, due to the cost of preparing detailed designs and plans, such detailed design/ planning information would only be developed in the event of environmental authorisation being granted. As such, it is anticipated that, as is typically the case in an EIA process, the EIA will assess broad land uses ; and
- That the comments received in response to the public participation programme so far, are representative of comments from the broader community.

Notwithstanding these assumptions, it is our view that this Final Scoping Report provides a good description of the potential issues associated with the proposed development, and a reasonable Plan of Study for EIA.

1.9 Structure of this Report

This report is divided into eight chapters:

Chapter 1 Background and Introduction

Introduces the Scoping Study, and the legal context, for the proposed solar facility

Chapter 2 Description of Development Proposal

Describes the various components of, and the motivation for, the proposed solar facility

Chapter 3 Nature of the Affected Environment

Provides an overview of the affected biophysical and socio-economic environment in the Cradock area

Chapter 4 The Public Participation Process

Describes the Public Participation Process (PPP) followed, and the issues & concerns that have been raised by Interested and Affected Parties (IAPs)

Chapter 5 Identification of Potential Impacts

Describes the potential positive and negative environmental impacts of the proposed solar facility

Chapter 6 Plan of Study for EIA

Provides a plan on how SRK proposes to address the identified potential impacts in the EIA phase

Chapter 7 The Way Forward

Describes the next steps in the scoping process

Chapter 8 References

2 Description of Development Proposal

2.1 Motivation for Proposed Activity

2.1.1 Electricity Generation

Two of the main rationales for the proposed solar facility are the need for additional energy generation as a result of increasing energy demand, as well as the contribution to the establishment of South Africa's renewable energy sector.

The White Paper of Renewable Energy (November 2003) recognises that South Africa's energy generation is predominately supported by coal-based energy generation (as a result of our large amount of coal resources) and has an extremely low market share of renewable energy generation. However, it is also recognised that the emissions of greenhouse gases, such as carbon dioxide, from the use of fossil fuels has led to increasing concerns about global climate change. The advancement of renewable energy resources is therefore recognised as a major contributor in countering climate change, protecting our natural resources, the biophysical environment as well as providing a range of environmental, economic and social benefits that will contribute towards long-term sustainability.

As reflected in the White Paper, the diversification of supply is an important element of improved energy security. South Africa is also well endowed with renewable energy resources, that can be sustainable alternatives to fossil fuels, but so far these have remained largely untapped.

The proposed solar facility would therefore contribute to energy security, both in terms of generating capacity, and in terms of diversified supply.

As the proposed development will also provide employment for some of the local community members, it is anticipated that the proposed development will provide some level of economic and social upliftment to surrounding local communities. These are discussed in the following two sections.

2.1.2 Economic Development

Although not the primary motivation for the proposed development, in terms of the bidding rules for the REFIT programme, the project will also contribute to economic development.

Under the guideline of the Integrated Resource Plan 2010- 2030, the RFP 3/11/2010 (Request for Proposal DOE/001/2011/2012) and REFIT program, successful bidders for renewable energy projects are obligated to develop a comprehensive Economic Development Plan. The Economic Development Plan will include the following seven dimensions:

1. Local Content;
2. Job creation;
3. Ownership;
4. Management Control;
5. Preferential Procurement;
6. Enterprise Development; and
7. Social Economic Development;

Minimum requirements include the following qualification criteria:

1. 40% South African Ownership;
2. Minimum BBBEE Level 5 status contributions from South African partners;
3. Local Community Ownership through a community trust; and
4. Minimum requirements in Local content, Job Creation, Ownership and Social Economic Development.

These measures have been put in place to ensure that the projects contribute towards both the growth and the transformation of the South African Economy. These contributions will vary from project to project, a typical project would contribute between 1.5 and 2.5% of the project turnover to community upliftment, and between 5 and 15% of the project equity to a community trust.

AF-ROM is committed to ensuring that their bid not only meets both the Department of Energy and NERSA's Economic Development requirements but also contributes towards the achievement of their goals and subsequently that of government.

In the case of AF-ROM Energy's Dobbin project, such contributions could amount to between R5 m and R15 m per annum for socio- economic development.

2.1.3 Employment opportunities

It is expected that maintenance activities during the operational phase will include inter alia, replacement and washing of the PV panels (potentially using water obtained from existing facility boreholes or reservoirs).

Approximately 400 workers will be required for the construction phase and approximately 45 permanent staff will be employed for the operational phase.

Table 2-1: Employment opportunities during construction

Type of labour	Number of labourers	Local/non-local
Unskilled labour	165 – 220	100 % employed from local community
Semi-skilled labour	68 – 90	80 -90 % employed from the local community
Skilled labour	Mechanics: 30 – 40	75 – 80% employed from local community
	Electricians: 8 -10	50 % employed from the local community
	Engineers: 15 -20	100 % non- local

Labourers will be from local communities and as such will have their own, existing, accommodation. Skilled labour (30-35 labourers) will be housed in local guesthouses and/ or rental accommodation. Semi-skilled labour will need temporary housing (20 labourers) would be housed either in local accommodation, or the construction company would negotiate temporary facilities with the local municipality for construction of a construction camp, usually prefabricated housing.

Table 2-2: Employment opportunities during operation

Type of labour	Number of labourers	Local / non-local
Semi-skilled	Security guards: 17	Local
Skilled	Security shift supervisors: 2	Local
Skilled	Security manager: 1	Non-local
Unskilled	Cleaning staff: 17	Local
Semi-skilled	Cleaning management: 1	Non-local
Skilled	Electricians: 2	Non-local
Skilled	Management: 5	Non-local

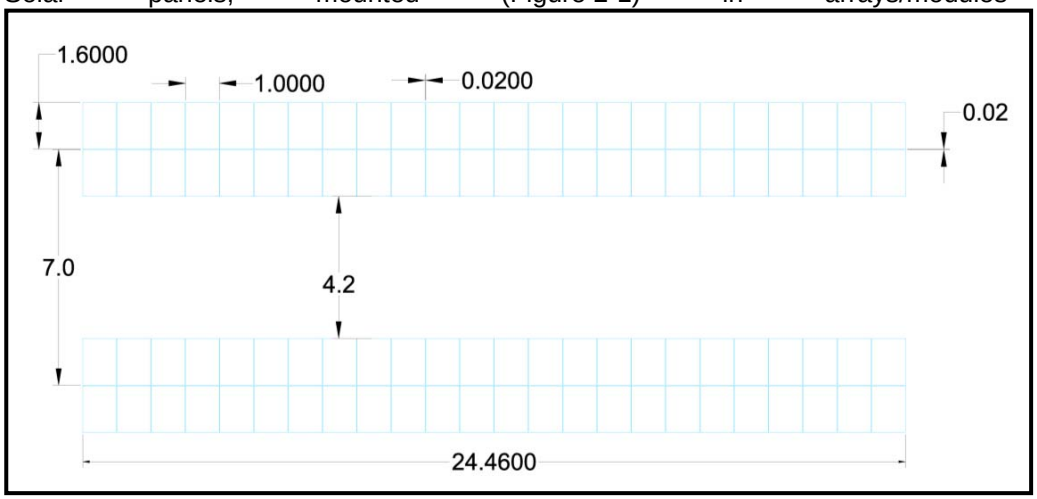
No staff will be accommodated on site, but rather will commute to the site.

2.2 Proposed Activities

Photovoltaic (PV) electrical power if generated by converting solar radiation into direct current electricity using semi-conductors which convert light energy into electrical energy. Solar panels are made up of a number of solar cells containing semi-conductors. A number of types of semi-conductors are commercially available, of which Copper Indium Gallium Selenide/ Sulphide (CIS) panels, and/or Silicon panels are proposed for this development. Solar panel may either be conventional or thin film technology.

The main components of a solar energy facility are listed as follows:

- Solar panels, mounted (Figure 2-1) in arrays/modules (



- **Figure 2-2**);
- Arrays/modules of solar panels arranged in clusters;
- Underground low voltage cables linking solar panels within a cluster to an inverter;
- Underground power lines (of a medium voltage) will be installed from inverter substations to a central collector/ step-up substation;
- The step-up substation will be an outdoor substation with transformers to step up the medium voltage (either 22 kV or 33 kV) to High Voltage (HV) 132 kV;
- A new 132 kV overhead line (less than 1 km in length) will be constructed and will run from the step-up substation to the Dobbin Eskom Substation which connects into the Eskom grid;
- Roads (Internal roads and access);
- Buildings (office, a control room for operation and maintenance personnel and equipment storage, ablution facilities for); and
- Security fencing (3 m high mesh fencing and security lighting (motion detecting spotlights) to be placed around the boundary of the site.

2.3 Project Phases and associated physical activities

The construction phase is expected to start within one year of successful application for preferred bidder status in the Department of Energy's REFIT programme, and take one year to complete. The operational phase is expected to have a lifespan of approximately 25 years after which the facility would either be decommissioned or refurbished for an additional 25 year operating period.

The main physical activities that will take place during each of the phases of the development are summarised below.

2.3.1 Construction phase (10 -12 months)

The following activities will take place during the construction phase:

- Conducting of surveys prior to construction (typically a geotechnical survey, a site topographical survey etc.);
- Clearing of vegetation in selected areas (e.g. for roads and substations) and possible removal of topsoil that will be stock piled and backfilled/ spread on site after construction;
- Construction of internal access roads as well as rehabilitation/upgrading of access road from the nearest provincial road;
- Transportation of equipment – most of the equipment could be transported in modules and would not need special arrangements except for the transformers may be classified as abnormal loads;
- Construction of camp and temporary equipment lay down areas – equipment will be temporarily stored in the lay down area before installation;
- Installation of PV panels, which entails the drilling of holes into the ground in order to install round galvanised steel posts upon which modular frames (with the solar photovoltaic panels) are to be attached to;
- Installation of a security fence around the boundary of the site. The area to be fenced is expected to be between 150 and 250 ha;
- Construction of inverter substations;
- Construction of a step-up substation. The substation will have transformers to step up the medium voltage (either 22 kV or 33 kV) to high voltage (HV) 132 kV. Switchgear and metering equipment will also be established in the substation;
- Installation of internal medium voltage (MV) underground power lines from the inverter substations to a central collector/ step-up substation;
- Construction of a 132 kV overhead power line. An overhead power line of approximately 1 km (length to be confirmed) will run from the step-up substation to the Eskom Substation;
- Construction of Control room for the operation, maintenance personnel and equipment storage; and
- Site rehabilitation.

2.3.2 Operation and Maintenance Phase (± 25 years)

The following activities will take place during the operation and maintenance phase:

- Cleaning of panels – Staff will be on site to clean PV panels four times a year (in 90 day cycles);
- Security staff will be permanently on site; and
- Control/ maintenance staff will be on site as required.

2.3.3 Decommissioning Phase

The following activities will take place during the decommissioning phase:

- Site preparation – a laydown area will be required when disassembling the equipment. Suitability of all roads should be assessed; and
- Disassembling and removal of equipment.

2.4 Project Alternatives

2.4.1 Site Alternatives

An area of 524.2 hectares has been leased by Af-Rom Energy (see Figure 1-1 on page 1) although the actual footprint of the development is anticipated to be less than 250 hectares.

No site alternatives are proposed as part of this application and consequently no site alternatives are assessed. The Dobbin site was identified based on its favourable climatic conditions for a solar facility, close proximity to the existing Dobbin 132 kV substation for connection to the Eskom grid, existing transport access onto the site, availability of water, and secure conditions (no casual traffic around the site).

2.4.2 Activity alternatives

Af-Rom Energy is specifically aimed at Photo-Voltaic Solar Facilities, and as such no activity alternatives are proposed.

2.4.3 Layout alternatives

The precise layout of the facility is dependent on the environmental and technical factors associated with the site. The input of a variety of specialists has been utilised in defining preferred setback lines from environmentally sensitive areas (water courses, sensitive plants/species, heritage features, etc.), and considerations of visibility and agricultural potential. This base layer has been used to generate two layout alternatives derived from the different sun tracking technology alternatives.

Alternative 1: Fixed Panels

This layout alternative is determined by the fixed panel mounting system, as described in Figure 2-1 and

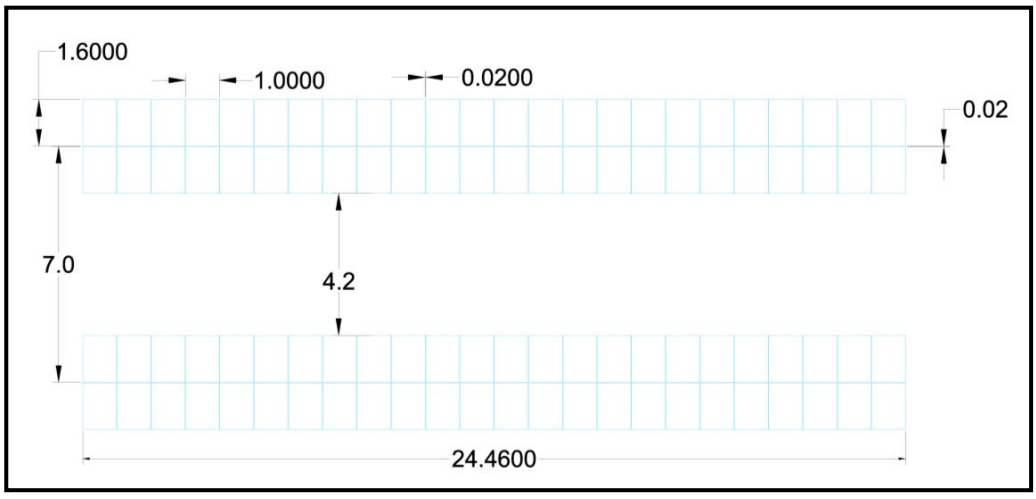


Figure 2-2. Under this alternative, modules of solar panels are supported on round galvanised steel frames. The proposed solar facility will be constructed in clusters, with a certain number of rows of solar panels per cluster (Figure 2-3), each row ±4.2 m apart. Clusters will be connected by underground cables to inverter substations.

The arrangement of fixed panels, involving two rows of panels on an array for each 4.2 m separation between arrays, results in a smaller (and denser) development footprint (Figure 2-4). On the other hand, the yield from each fixed panel is less than that obtained by means of tracking panels (tracking panels have a 20% higher yield). Fixed panels are advantageous in the extent of land required, but are not preferred economically.

In this arrangement, panels are orientated along an east / west axis, facing to the north.

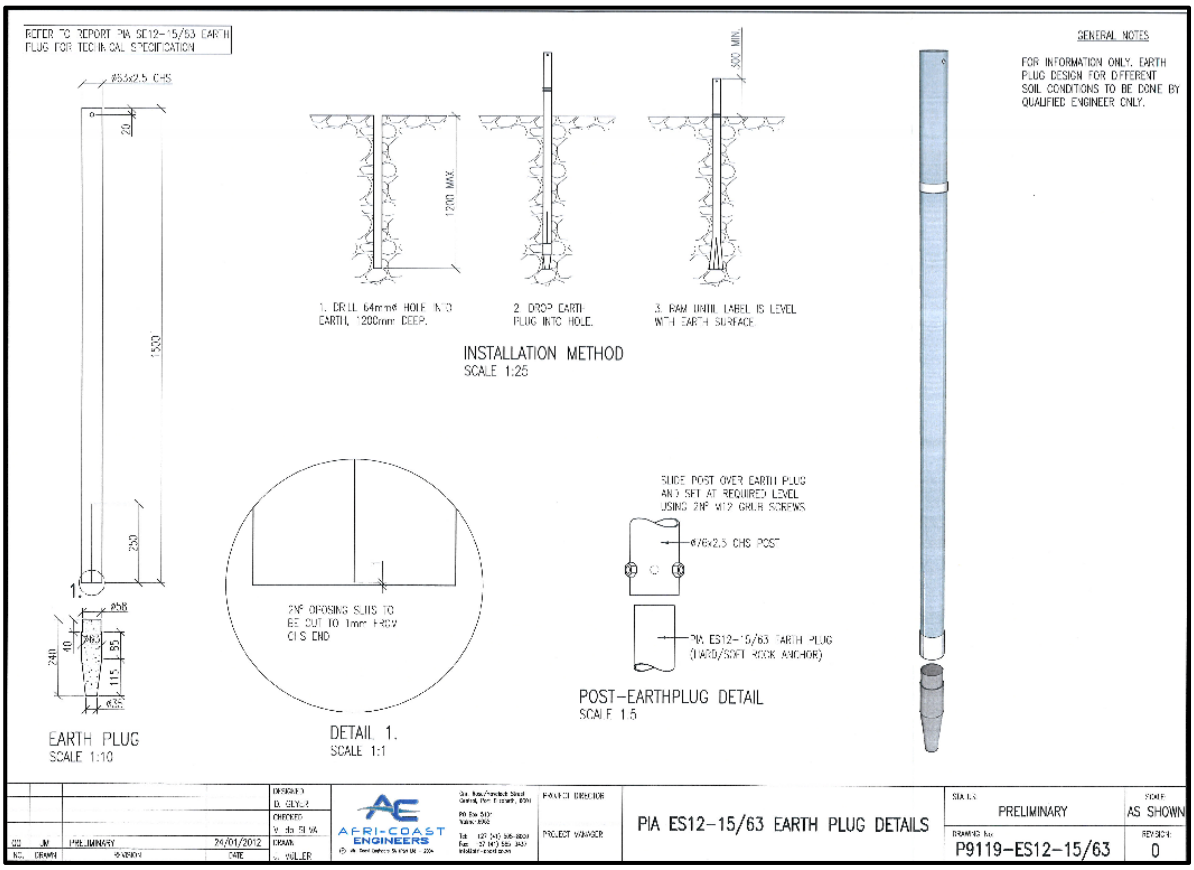


Figure 2-1: Proposed anchoring system

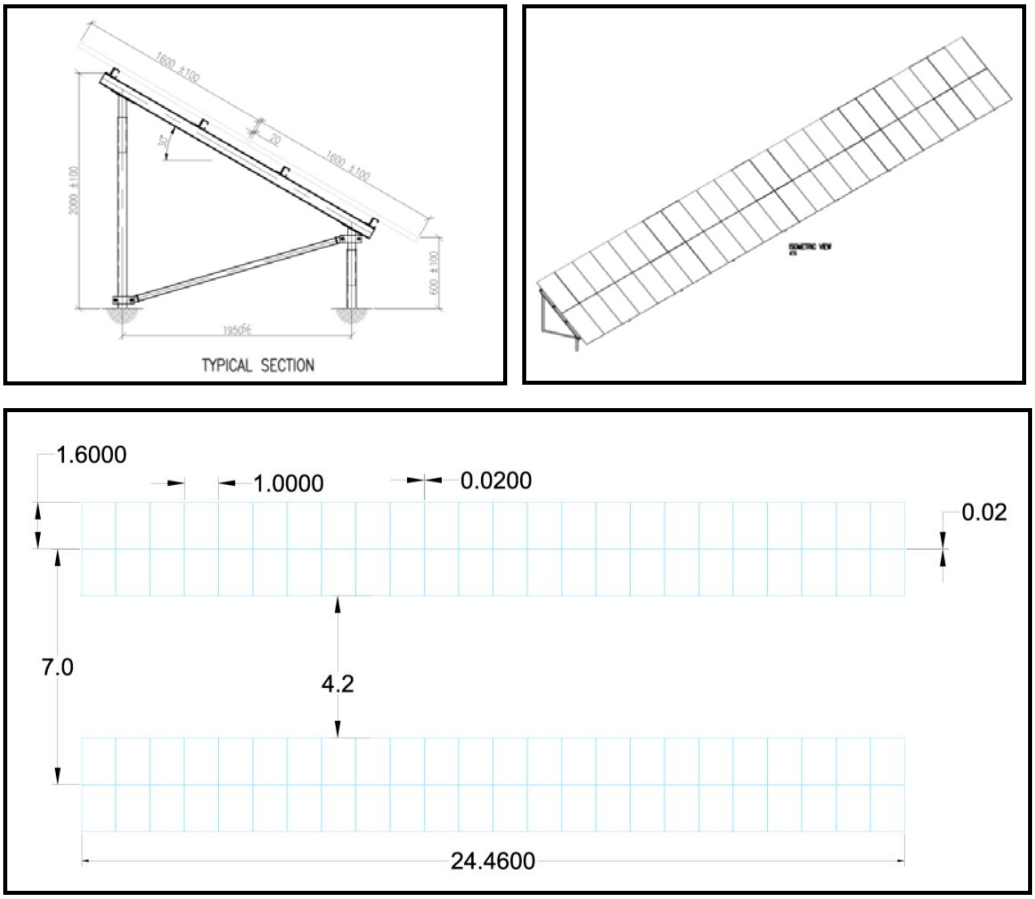


Figure 2-2: Typical arrangement of fixed panels (Drawing number P8801 - ELE - DET - 02 - SHT1 - PRE - 00, Appendix G)

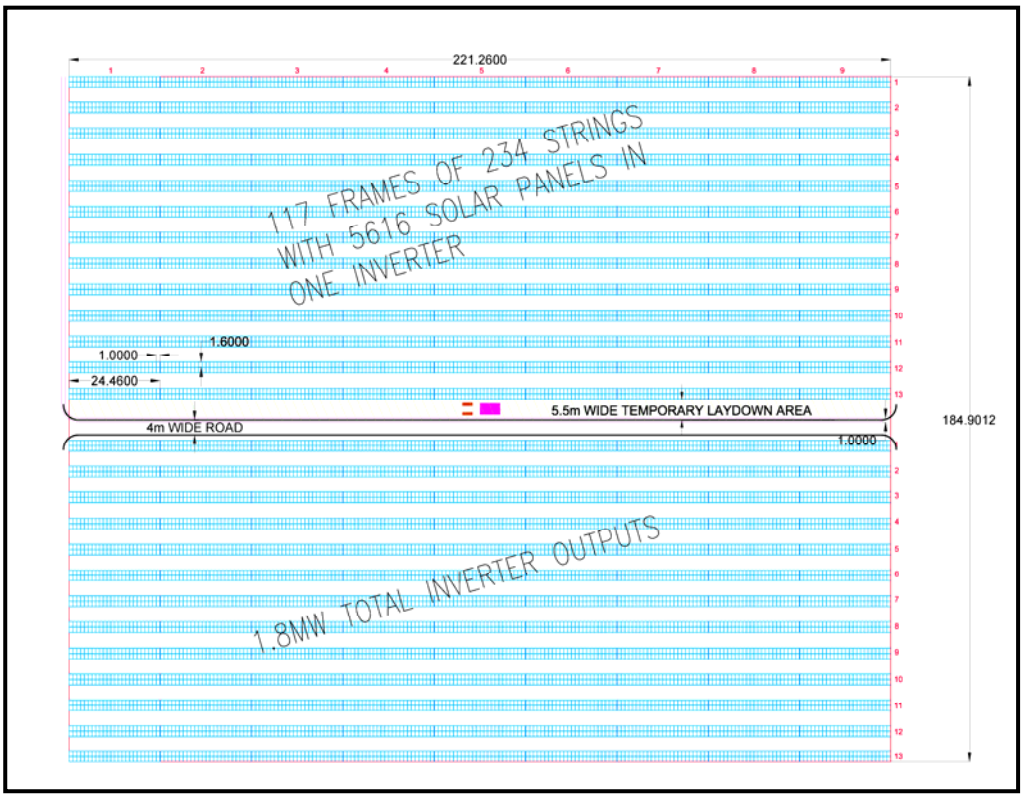


Figure 2-3: Block layout of layout alternative 1, fixed solar panels (Drawing number P8801 - ELE - DET - 01 - SHT1 - PRE - 00, Appendix G)

Figure 2-4: General arrangement of layout alternative 1 (Drawing number P8801 - ELE - GA - 01 - SHT1 - PRE - 00, Appendix G)

Alternative 2: Tracking Panels

This layout alternative is also determined by the space and orientation requirements for the tracking system. Under this alternative, panel are arranged in continuous lines on a north-south axis and rotate around this axis to maintain a constant angle of incidence with solar radiation.

The general arrangement of tracking frames is shown in (Figure 2-5) and of each cluster in (Figure 2-6). Clusters will be connected by underground cables to inverter substations, and separated from each other by a ±5 m wide road. This arrangement leads to layout alternative 2 (Figure 2-7).

This layout alternative has the following consequences:

- Higher yield from panels (approximately 20% higher);
- Less shade under the panels, i.e. for any point of the surface, the amount of time that such a point is in the shadow of a panel is less than for fixed panels; and
- Less possibility of reflections to nearby receptors.

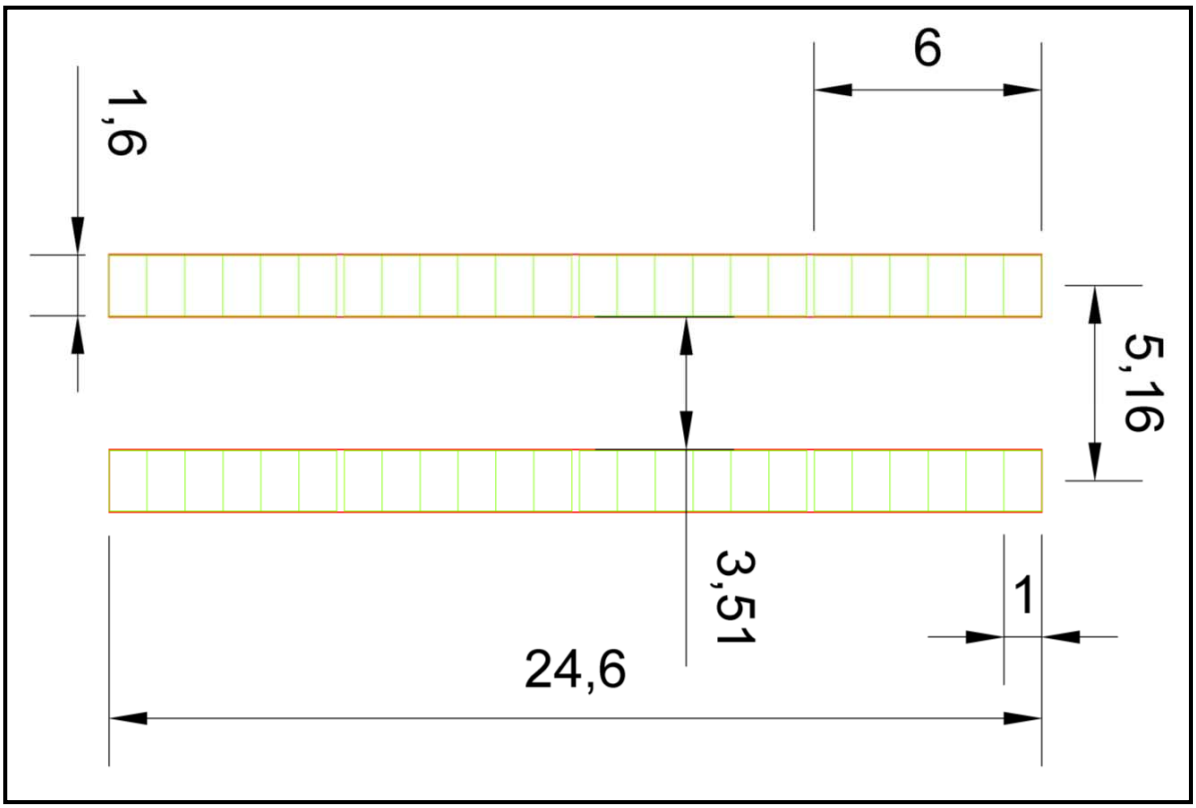


Figure 2-5: Arrangement of tracking frames (Drawing number P8801 - ELE - DET - 02 - SHT1 - PRE - 00, Appendix G)

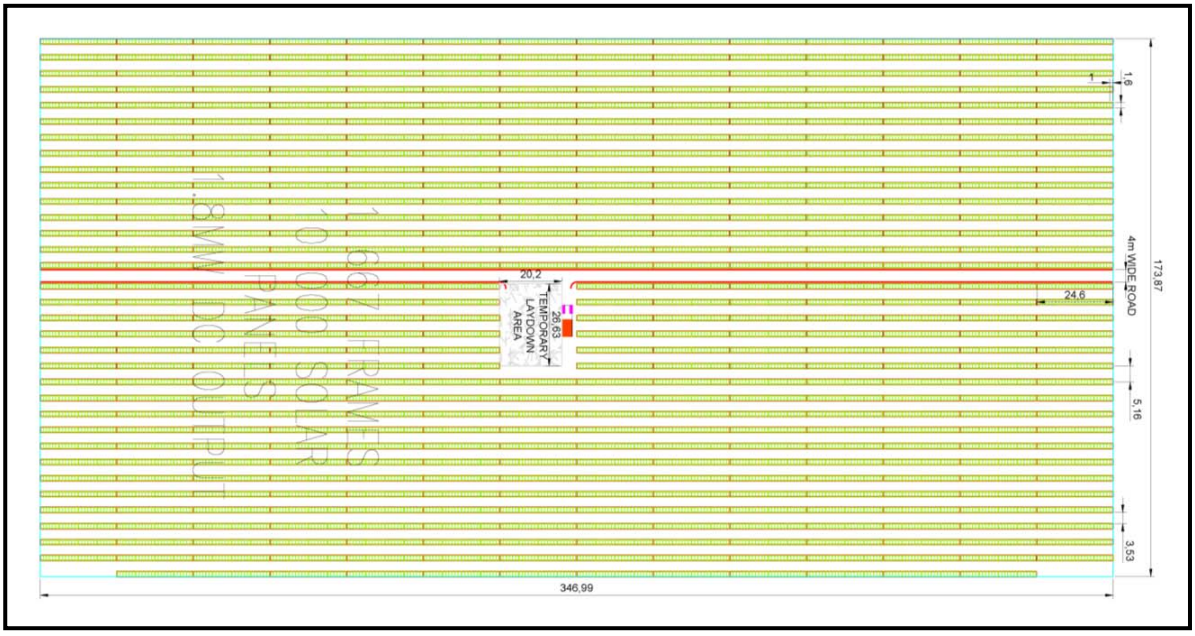


Figure 2-6: Block layout of layout alternative 2, tracking solar panels (Drawing number P8801 - ELE - DET - 01 - SHT1 - PRE - 00, Appendix G)

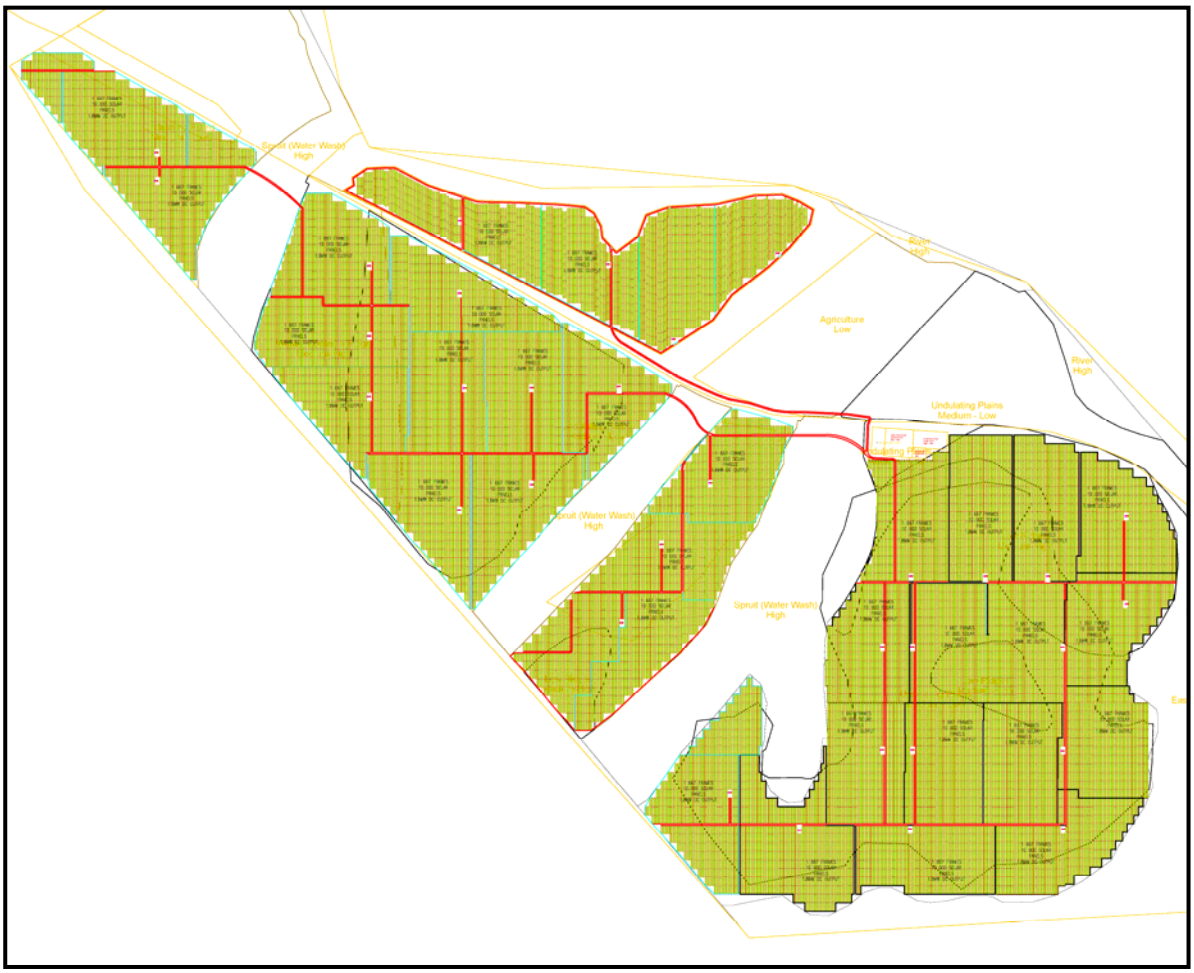


Figure 2-7: General arrangement of layout alternative 2 (Drawing number P8801 - ELE - GA - 01 - SHT1 - PRE - 00, Appendix G)

2.4.4 Technology alternatives

Semi-conductor technology

Technology alternatives have been considered in the selection of PV semi-conductor technology. Solar panels are made up of a number of solar cells containing semi-conductors. A number of types of semi-conductors are commercially available, of which Copper Indium Gallium Selenide/ Sulphide (CIS) panels, and/or Silicon panels are preferred for this development. Solar panels may either be conventional or thin film technology.

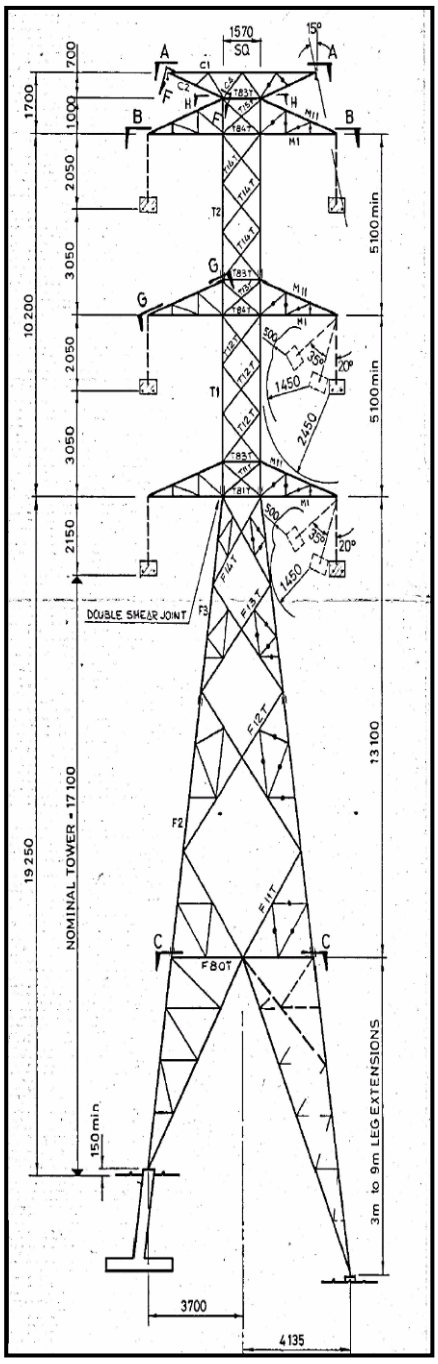
Cadmium Telluride panels are a technically viable alternative, but have been excluded from further assessment due to potential concerns expressed regarding these PV panels on other EIA's, and in particular that they contain hazardous chemicals. The potential for leaching of these chemicals into the environment during normal operation is exceptionally low, and as these chemicals have a high value the recovery of these from used panels would be commercially attractive (hence reducing the risk of incorrectly disposed panels). Notwithstanding this, due to the potential concerns from Interested and Affected Parties, Cadmium Telluride panels are not proposed for this facility.

Overhead vs Underground 132 kV power line

Generated electricity is collected via a system of underground medium voltage cables, and then transformed into high (132 kV) voltage and reticulated to the existing 132 kV Dobbin substation. The length of the 132 kV line depends on the final layout, and the position of the internal substation, which is most energy efficient if in the centre of the PV panels. The length of the 132 kV line is

expected to be in the order of 1 km or less. The following alternatives are considered for this 132 kV line:

- **Above ground transmission (preferred technical alternative):** The most economical; and technically preferred alternative is a 30 m high lattice mast similar to the generic design reproduced here. This design is similar to the existing Eskom lines to the Dobbin substation. Above ground transmission is preferred due to initial cost, ease of maintenance, and ability to span environmentally sensitive areas and the Transnet railway line. On the other hand, above ground lines are visible, and can have a negative impact on birds.
- **Below ground lines** are technically feasible and would be implemented in the event that environmental above ground lines are environmental unsuitable.



2.4.5 Operational alternatives

Cleaning of the panels (to optimise their operation) would be necessary from time to time (depending on the amount of dust in the air). This could either be done using water, or waterless cleaning (which the applicant is proposing when possible, so that less water is required during operation).

It is assumed in that panels will be washed with water, including small amount of biodegradable detergent, four times a year (90 day cycles). Approximately 9,500 litres of water per day will be required to achieve this. It is anticipated that existing boreholes within close proximity to the facility be used as the primary water source. Alternatively, municipal water can be obtained by tankers from Cradock; however this will have implications on carbon emissions. A third technical option is by dry means.

2.4.6 No-go option

The no-go alternative would see the current land use of the site continue. Not implementing the activity would have the following socio-economic and environmental implications:

- Comparatively low value agricultural activity would continue;
- No production in energy would result in less energy security at a national level;
- The potential for job creation associated with the project would be lost; and
- Additional social benefit schemes (such as job training and skills programs), linked to the development would not materialise

2.5 Associated infrastructure

In addition to the main components of the development proposal as listed in Section 2.2, a number of related infrastructure is required.

2.5.1 Roads (access and internal)

Access to the site will be via an existing gravel road that turns off the N10, which may need to be rehabilitated/ upgraded. Internal roads will need to be constructed on the site to access all parts of the development for the whole duration of the development. These roads could be gravel or paved.

2.5.2 Water supply

Water is required on site for ablutions and for washing of panels. During the construction phase water may also be needed for dust suppression and building requirements.

Water supply to the site is likely to be from boreholes, either existing or new. In the event that groundwater supply is not environmentally sustainable, then water would need to be delivered by road tanker from the nearest water services provider.

The anticipated water demand during operation is estimated to be 9,500 L/day.

2.5.3 Wastewater

Small quantities of sanitary wastewater would be generated from staff facilities on the site. It is anticipated that this waste stream would be directed to a septic tank and soak away. In the event that this is not technically feasible, then conservancy tank(s) would need to be installed.

2.5.4 Solid Waste Management

A number of waste streams are anticipated. These include:

- Considerable amounts of solid waste (mainly packaging material) during the construction phase. This waste stream, and the storage thereof, would be temporary and inert;
- Small quantities of domestic waste associated with the staff facilities during the construction and operational phases;
- Occasional scrapped equipment during the operation of the site (e.g. defective panels, tracking systems, etc.); and
- Occasional transformer oils from routine maintenance activity.

It is anticipated that these, and other waste streams can be readily managed, including any temporary on site storage, and transportation for off-site disposal. A considerable amount of the waste generated would be recyclable, and some of this would have high economic value.

3 Nature of the Affected Environment

The receiving environment has been described using a combination of on-site observations, GIS information, specialist studies and previous studies currently available to SRK.

3.1 Biophysical Environment

3.1.1 Archaeology

Archaeological visibility was generally good throughout the proposed area except where dense grass and bush vegetation occurred. The exposed and disturbed areas were investigated for the possibility of archaeological remains, features, and sites.

The proposed area has been heavily disturbed by the construction of the Dobbin Substation and associated powerlines that run east-west across the property and the Telkom tower and associated telephone lines that also run east-west across the proposed area, as well as the Cradock to De Aar railway line that cuts through the proposed area. Cultural agricultural lands, internal dirt farm roads and fences, erosion dongas and a quary (DQu1) also add to the areas that have been disturbed and may therefore expose or move the archaeological heritage remains out of *in situ* context.

Isolated surface scatters of patinated and weathered Middle Stone Age stone artefacts were documented within the proposed area. The stone artefacts were mainly manufactured on a fine grained black (hornfels) raw material and included flakes, blades, and cores. Some of the stone artefacts showed evidence of secondary retouch and edgedamage, although some of the edge-damage is recent and may have been caused from trampling by humans and animals. The surface scatters of stone artefacts are probably not in situ and therefore occur in a secondary context. No other archaeological organic or material remains were observed in associated with the stone artefacts. However, according to previous observations the stone artefacts may occur between the surface and 50-80 cm below ground.

A Later Stone Age (LSA) site (HF1) was documented in the north-western portion of the proposed development. The relatively exposed area is situated on a slight gradient slope and is approximately 75 m x 75 m in extent. The site comprised several formal tools such as scrapers and an adze with several flakes and chips manufactured from a fine-grained black (hornfels) raw material. It is unlikely that the site would have any significant depth of archaeological deposit. No other organic or material archaeological remains were observed in association with the stone artefacts.

Several rock engravings were documented on the outcrop that extends from the N10 north across the proposed area (DRE1-DRE4). Granite boulders occur along the top of the outcrop extending north-south through the proposed development for approximately 1050 m. The images comprised mainly scratches, cross hatchings, and a few animal and indeterminate images. More than twenty granite boulders with rock engravings were recorded along the extent of the outcrop, however, several more granite boulders with engravings were observed during the walkthrough. A pile of stacked rocks topped with a granite rock with engraving was documented at the area marked DRE2. No other material or organic archaeological remains were found in association in and amongst the boulders. Rock engravings are generally associated with the Later Stone Age (LSA) made by hunter-gatherers and several rock engravings on similar boulders have been documented within the greater Cradock and Karoo area. However, rock engravings may also be attributed to the historical period which would have been made by shepherds overseeing domesticated animals.

Broken glass, ceramics, and fragments of metal and tin occur along the entire extent of the railway line that passes through the proposed area. The remains possibly comprise both recent and later pieces and have presumably been discarded from the trains that pass through the area. Broken glass, ceramic, and fragments of metal and tin also occur adjacent to the internal farm road between

the areas marked DRE1 and DF3. The area resembles a dump and similarly seems to contain both recent and later pieces.

Several packed stone features occur within the proposed area. The area marked DF1 and DF2 comprises four packed rock features immediately east of the quarry. It is possible that these packed rocks may be associated with the quarry activities. DF3 is a neatly arranged dry packed stone feature situated immediately south of the internal farm dirt road. The packed rock feature at the area marked DF4 occurs north of the HF1. The remains of a weir was documented along the riverine area, however, it has been established that these areas will not be affected by the proposed development. A dry packed stone wall runs along the existing fence line on the eastern boundary outside. The stone wall occurs outside of the proposed development area and is not expected to be affected by the proposed development.

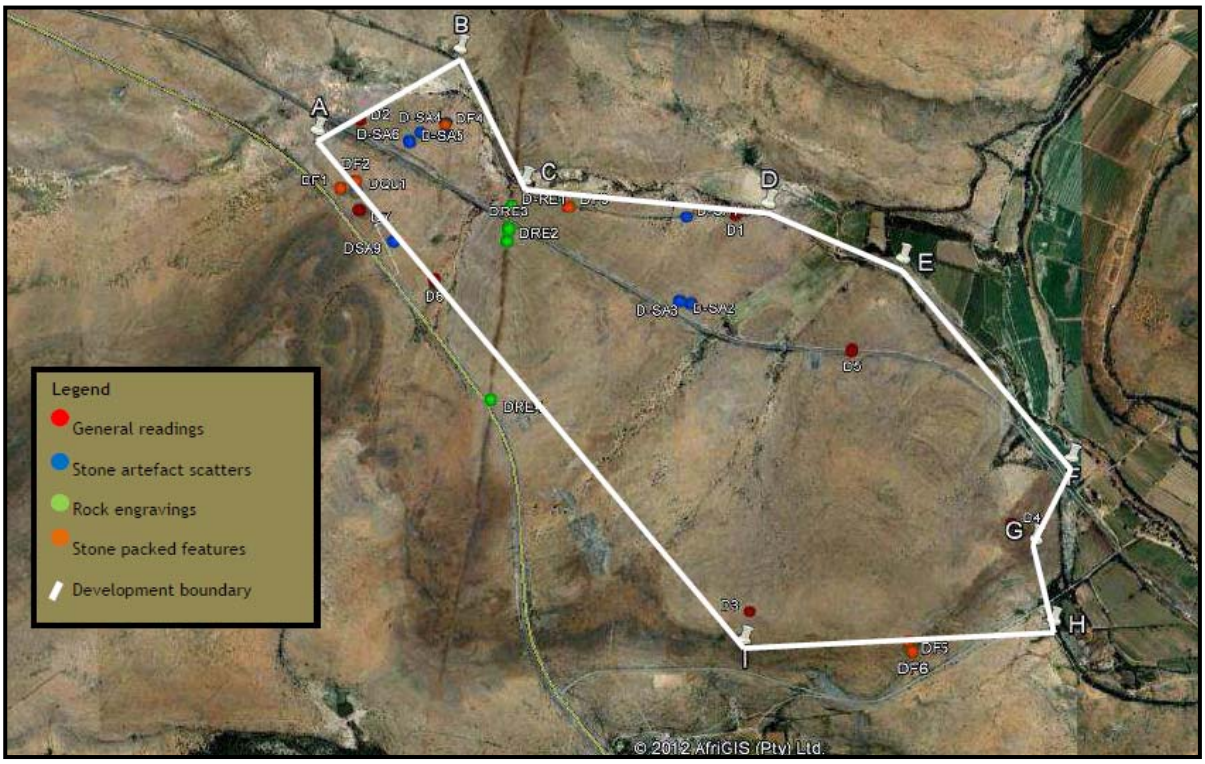


Figure 3-1: Location of identified artefacts

3.1.2 Geology & Palaeontology

This section is based on a Palaeontological Assessment conducted by Dr John Almond of *Natura Viva cc* as part of the discontinued Basic Assessment process (Almond, 2012).

The area is largely underlain at depth by fluvial sediments of the Late Permian Adelaide Subgroup (Pa, Lower Beaufort Group, Karoo Supergroup) that are extensively intruded here by dykes and sills of the Early Jurassic Karoo Dolerite Suite. The Adelaide Subgroup is not subdivided on the Middelburg sheet map due to lack of key marker horizons. However, on the basis of palaeontological data the study area can be equated with the Balfour Formation of the Eastern Cape which is characterized by fossil faunas of the Dicynodon Assemblage Zone. The finely-stepped terrain, well seen on satellite images, suggests that this part of the Adelaide Subgroup succession is rich in thin sandstone packages (cf Barberskrans Member). However, this may also reflect the regional thermal metamorphosis (baking) of the Beaufort Group rocks here by a substantial underlying dolerite sill, the margin of whose outcrop is clearly seen as a rusty brown zone on the satellite image towards the west of the study area.

Given the paucity of natural bedrock exposures, the best sections through the Adelaide Subgroup rocks here are seen along extensive railway cuttings, in N10 road cuttings, in shallow irrigation ditches and in the walls of a large borrow pit just to the south of the area. The railway cuttings were not examined closely for reasons of safety and access, however they show lenticular packets of channel sandstones (secondarily stained with rust from the railway) interbedded with hackly-weathering, grey-green to blue-grey mudrocks. Interesting sedimentological features seen here include probable abandoned meander channels infilled with thinly-laminated, dark mudrocks (possibly hosting fossil remains of aquatic fauna, such as bivalves, fish or amphibians) and large-scale epsilon cross-bedded sandstones reflecting lateral migration of sandy point bar deposits. In the borrow pit can be seen massive to thinly-bedded, blue-grey siltstones and darker claystones representing distal, fining-up floodplain deposits; thin, lenticular channel sandstones also occur here. The mudrocks contain sparse, rusty-brown to speckled calcrete nodules that are occasionally concentrated along laterally-persistent zones reflecting ancient soil horizons. The calcretes in the study region have generally been secondarily ferruginised and silicified as a consequence of dolerite intrusion. Curious isolated, sand-infilled bodies of lenticular cross-section and 1cm thickness within the much finer-grained overbank mudrocks might be fossil invertebrate burrows, though this is highly speculative.

On the gently-sloping hill slopes near the electrical substation where the solar facility, the Adelaide Subgroup rocks are largely obscured by reddish brown soils and downwasted gravels largely composed of platy, angular sandstone clasts, with minor silicified calcrete nodules, quartzites (rarely flaked), hornfels, and dolerite. Rare mudrock exposures show weathered olive green, hackly-weathered sediments, sometimes baked reddish-grey with a more splintery, hornfels fracture, and thin (cm-thick) distal crevasse splay sandstones. More prominent-weathering, buff, sheet-like channel or crevasse-splay sandstones show well-developed ripple cross-laminated upper surfaces. Occasional sandstone float blocks preserve small-scale (1-2cm wavelength) linear-crested wave ripples and were probably deposited within a playa lake on the Permian floodplain.

A major dolerite sill and a swarm of NNE-SSW trending dolerite dykes are mapped intruding the Beaufort Group sediments in the study region. A high proportion of the Beaufort sediments within the study area must have experienced thermal metamorphism and attendant chemical alteration (metasomatism) during dolerite intrusion in Early Jurassic times. Clear sections through one of the main, steeply inclined dolerite dykes are seen in railway cuttings while the sharp contact between massive to well-jointed, dark-grey dolerite of the main sill and the overlying baked, well-bedded Beaufort Group sediments is well-exposed in road cuttings along the N10. Small, obliquely-inclined dolerite dykes leading off from the main sill are also seen here. The mudrocks have been metamorphosed to hornfels, while the channel sandstones are altered to pale quartzites. A substantial abandoned quarry excavated into the main dolerite body is situated just west of the study area.

Good sections through the rocky superficial sediments are exposed along the edges of the main borrow pit. The Beaufort Group bedrocks here and elsewhere are mantled by soils containing numerous dispersed, subhorizontal platy clasts of sandstone within a matrix of mudrock fragments. Downwasting of these deposits, which are perhaps of colluvial origin, leads to the surface mantle of platy sandstone gravels that covers much of the study area. Coarse, bouldery, calcrete-cemented alluvial gravels, mainly of sandstone, are exposed in shallow stream beds traversing the study area.

3.1.3 Topography

The site is characterised by undulating rocky landscape. The overall topography of the study site is slants in a north-easterly direction, but this does not happen relatively uniformly, but rather ‘stepwise’. Small low plateaus are interrupted by narrow, somewhat rockier and steeper ridges –

followed by small lower-lying plateaus that are again separated from the lower undulating plains by similar small ridges (Bredenkamp, 2012).

3.1.4 Land Use

This section is based on an Agricultural Potential assessment conducted by Mr John Phipson of Mzansi Agriculture as part of the discontinued Basic Assessment process (Phipson, 2012).

The site falls under Land Capability Classes (LCC) VII and VIII, suitable for livestock and game only. The site is used for supplementary winter grazing in dry years and other occasional casual use. There are no current crops on the site, nor evidence of any previous crops.

3.1.5 Surface Water

There are a number of drainage lines that cross the site and drain into the Great Fish River that is located east of the site. A small dam is also located at a lower point of one of the drainage lines.

3.1.6 Ecology

This section is based on a vegetation & flora assessment, and an avi-fauna assessment, conducted by Ecoagent ecology and biodiversity consultants as part of the discontinued Basic Assessment process.

Vegetation and flora

According to the South African vegetation map, three vegetation types occur on site, namely Tarkastad Montane Shrubland, Eastern Upper Karoo and Southern Karoo Riviere which are all classified as least threatened (Mucina and Rutherford, 2006). Although the conservation status of the vegetation types covering the study site is considered least threatened, it must be noted that the site does fall into the Albany Centre of Endemism, with several species of which the threat status is expected to change with land transformation and global change. Further, the site also is classified as an Aquatic Critical Biodiversity Area (Levels A2b, A (E) 3a, and A (E) 3b) according to the Eastern Cape Biodiversity Conservation Plan Handbook. This implies that whatever happens on the site may have consequences for adjacent and downstream aquatic ecosystems as well.

The larger area has at least seven plant species of conservation concern. It supports four main structural habitats for flora, being water washes, moderate to steep dolerite ridges, shallow ridges and undulating plains. The habitats considered most sensitive on the site are the dolerite ridges and water washes

The study site supports four main structural habitats for flora, being clay-rich plains, shale flats, shale ridges and dolerite outcrops. The habitats considered most sensitive on the site are the dolerite outcrop and shale ridges. The clay-rich plains have the lowest sensitivity and, together with the surrounding shale flats could be used for the proposed development, although this may impact on available grazing, the stability and composition of the vegetation, and could be a cause of excessive degradation of the area and beyond if appropriate measures are not taken.

The habitat based plant communities present on the site may be summarised as follows (Figure 3-2):

- Water washes: Higher moisture levels stored underground support a higher and denser vegetation than on the overall surrounding areas Dominant species include *Acacia karroo* and *Eragrostis lehmanniana*;
- Low Ridges: Due to a larger component of surface rock, low ridges on site provide more niches for a higher diversity of species than the surrounding flatter areas and thus provide several ecosystem functions to the surrounding environment. Dominant species include *Ocimum burchellianum, Rhigozum obovatum*, and *Ruschia intricate;*

- Eastern Dolerite Ridge: This relatively small portion along the south eastern to north eastern fringe of the study area presents the highest diversity in habitat-niches due to the very variable substrate and associated moisture retention properties. Of all the habitats on the site, it has the highest diversity of succulent plants. Dominant species include *Diospyros lycioides, Ocimum burchellianum, Pentzia incana,*and *Heteropogon contortus;*
- Western Dolerite Ridge: This ridge traverses the site in an almost straight, north-south narrow band the rockiness acts as mulch and protection of growing tips to vegetation here, rendering it a higher resilience and a generator of seed to surrounding areas. Although the species composition is not as unique as on the eastern dolerite ridge and its rockiness makes it unsuitable for grazing, the seed-generating function of this ridge is of agricultural value Dominant species include Ocimum burchellianum and Heteropogon contortus;
- Undulating Plains: Species diversity for this community is indicated as very high, but that may be misleading as on a site-specific scale, diversity will be much lower. Dominant species include *Ocimum burchellianum, Pentzia incana, Ruschia intricata,* and *Eragrostis lehmanniana.*

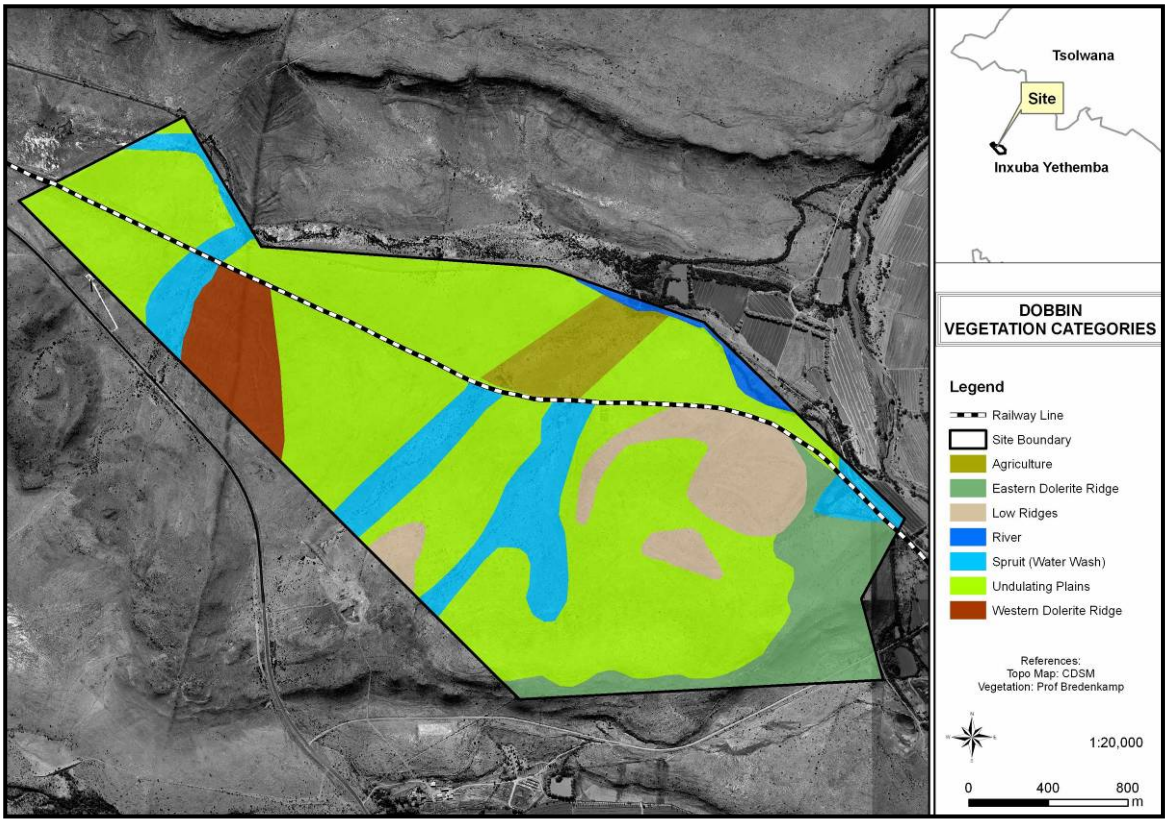


Figure 3-2: Plant communities per habitat type

Avifauna

Many of South Africa's endemic and range restricted avifaunal species occur in or are confined to the Karoo. This habitat system will favour avifaunal species associated with arid and semi desert areas such as warblers, cisticolas, chats, larks, buntings, bustards and korhaans that prefer large open areas for foraging, roosting and breeding purposes. These birds are found in areas with low human populations and most are consequently not classified as threatened, despite there being few protected areas in the Karoo. However the Karoo is home to some of the most threatened species.

The following birds may occur on the study site and are classified as vulnerable according to the Red Data Bird Species list:

- Ludwig's Bustard (*Neotis ludwigii*): These birds are frequently killed in collisions with overhead lines. The entire area on the study site offers ideal breeding, roosting and foraging habitat for this species;
- Blue Crane (*Anthropoides paradiseus*): Grassland loss through land-use alternation combined with agrochemical poisoning is the main reasons for this species population decline. The entire area on the study site offers ideal breeding, roosting and foraging habitat for this species;
- Lesser Kestrel (*Falco naumanni*): The Lesser Kestrel is sensitive to dense human disturbance and population. Fragmentation of its preferred open grassland habitat is one of the main threats to this species as well as the human disturbance that comes with development. The habitat on the study site offers ideal foraging habitat for this species.

The following birds may occur on the study site and are classified as near threatened according to the Red Data Bird Species list:

- The Black Harrier (Circus maurus): The largest threat to this species is loss and mismanagement of their breeding habitats and the fluctuation of its rodent prey base. The habitat on the study site offers ideal foraging habitat for this species; and
- Lanner Falcon (Falco biarmicus): There are reports of decreasing numbers in intense agricultural in the grassland biome. Extinction can also be attributed to poisoning.

The habitat on the study site offers ideal foraging habitat for this species. They may breed on suitable cliffs surrounding the area or on man made structures on and surrounding the study site.

3.1.7 Visual

This section is based on the Visual Impact Specialist study conducted by Mr. Wouter Jordaan, Mr. Keagan Allan and Ms. Andrea Murray-Rogers of SRK's Durban office as part of the discontinued Basic Assessment process.

Visual Character

The site lies to the east of the N10 within the boundary of Portion 1 of Farm Het Fortuin No. 66.

The site is surrounded by predominantly pastoral agricultural fields. Plates 3.1 and 3.2 provide examples of the type of vegetation and topography found around the site.

The study area can be divided into distinct 'land types' each with a dominant landscape character. These land types are:

- Agricultural; and
- Semi-natural areas.

Table 3-1 presents the various landscape character descriptions that are used in the Hassell Matrix. Table 3-2 presents how each of the main visual components of the proposed Dobbin operation can be described from Table 3-1.

Table 3-1: Land Use Character Rating System

Description	Value	Typical Character / Use
Unmodified landscape/natural	5	No / minimal impact associated with the actions of man. National parks, coastlines, pristine forest areas.
Natural transition landscape	4	A changing landscape character associated with the interface between natural areas and modified rural / pastoral or agricultural zones.
Modified rural landscape	3	Typical character is rural landscape, defined by field patterns, forestry plantations and agricultural areas and associated small-scale roads and buildings.

Transition landscape	2	Transitional landscape associated with the interface between rural, agricultural area and more developed suburban or urban zones.
Highly modified landscape, urban/industrial.	1	Substantially developed landscape. High levels of visual impact associated with buildings, factories, roads and other related infrastructure.

Table 3-2: Visual Character of the Main Features

Study Site	Visual Character	Rating
Dobbin Site and Associated Infrastructure	The visual character on and around the proposed Dobbin site could be described as being a Modified Rural Landscape, primarily due to agricultural land and grasslands which surround the site, as well as the small developments which surround the site	3

As it can be seen in Plates 3.1 and 3.2 the Dobbin site is surrounded by undulating grassland plains, which places it into the Modified Rural Landscape Category. Figure 3.1 shows the topography around site. The Dobbin site is located in a natural low-point in the landscape, surrounded by small hills which aid in containing views of the site to within the valley.

Plate 3.1: View east from the N10 towards the site showing low vegetation and relatively flat topography

Plate 3.2: View south south-east towards the site from the N10, showing the vegetation and topography

Visual quality

The proposed Dobbin site falls in an area which is relatively flat. The N10 and a railway line runs through the site on the north-west portion of the site. The site is located to the east of the N10 within the boundary of Portion 1 of Farm Het Fortuin No. 66. Due to this, the visual quality rating for the area could be described as MEDIUM, due to the lack of natural features in the close vicinity of the site.

Sense of Place

In terms of being distinct from other areas, this site falls along the N10 between Middelburg and Craddock; the landscape between these two towns is relatively flat and made up of pastoral agricultural fields. Thus this site is not different from the surrounding landscape in its current form, thus altering the site through constructing the PV arrays may change the sense of place for the site. This change could be seen as a positive, as the sense of place of the site could allow for the site to be unique in the area. Currently, the sense of place for the site could be seen as LOW.

Visual Exposure

Due to information pertaining to the layout of the Dobbin Site, four hypothetical scenarios were used in terms of creating the viewsheds for the site. In order to determine which portion of the full site would have a lower visibility based on the viewshed, the site was divided into four areas (A, B, C and D). Viewsheds were created for each of these sites and the visual exposure was determined for each. A viewshed analysis (from the centre of the site) is shown in Figure 3-3.

It must be noted for the study of the visual impact of the proposed activities at the Dobbin Site, each of the activities were investigated separately. Due to the contour dataset not taking into account existing vegetation, structures or small undulations in the landscape, each of the activities was modelled on a hypothetically featureless surface. Areas on this surface, where the given activity may be visible, are highlighted.

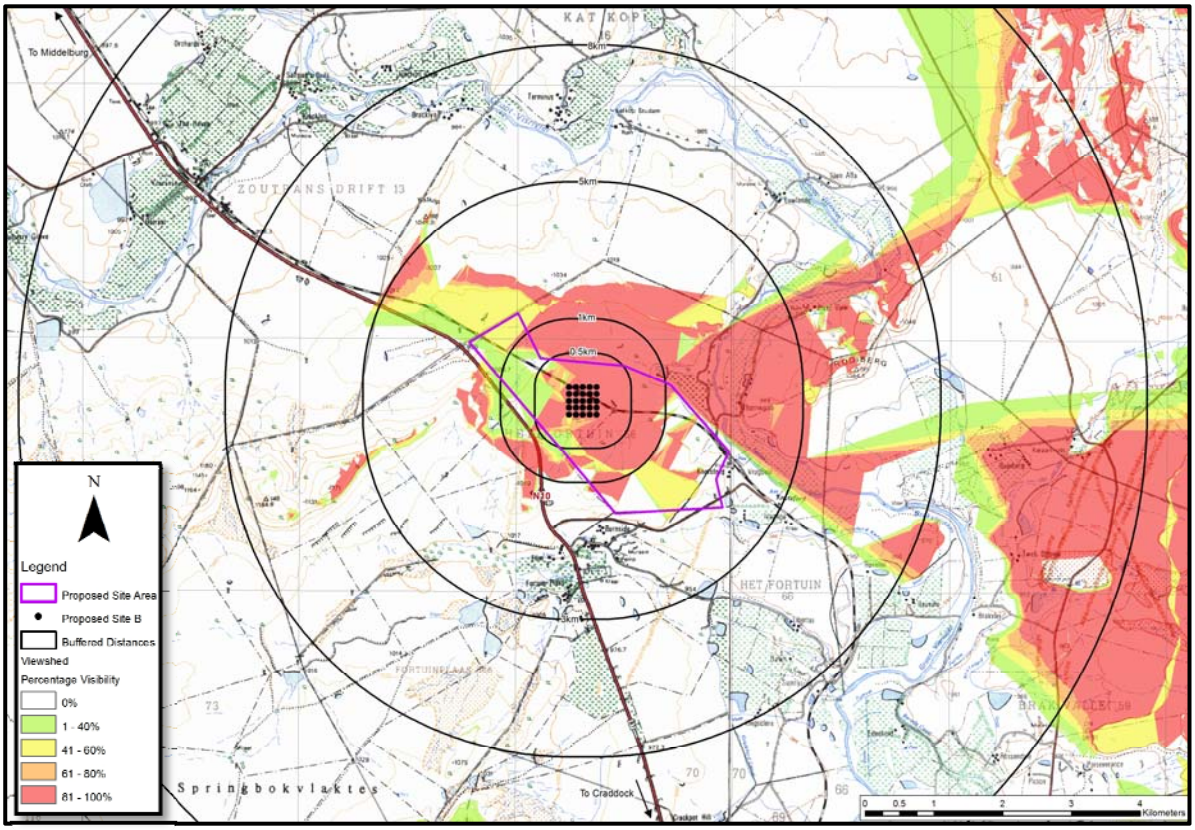


Figure 3-3: Viewshed analysis from centre of the site

3.1.8 Noise

The site is remote and ambient noise is that typical of deeply rural areas. The only routine sources of noise generated by human activity are the occasional trains passing the site, electrical noise from the existing substation and N10 road users. Neither of these noise sources is significant.

3.2 Existing Socio-Economic Environment

This section is based on the Socio-Economic Specialist study conducted by SRK's Cape Town environmental department as part of the discontinued Basic Assessment process (Placeholder2).

3.2.1 National Context: South Africa

South Africa is a middle-income developing country with an abundance of natural resources. It is the most industrialised country in Africa, leading the continent in industrial output and mineral production, with well-developed financial, legal, communication, energy and transport sectors. South Africa also has a smaller, but well developed, informal economy which interacts with the formal economy.

Two of the biggest challenges facing growth in the South African economy are poverty and unemployment. Current estimates place unemployment figures in South Africa at ~24%. The South African government aims to alleviate unemployment and poverty with policies aimed at increasing economic growth in a stable economic environment.

Between 1999 and 2008 South Africa experienced sustained economic growth with GDP growing at an annual average of 5.4%. The 2008 global financial crisis resulted in a reduction in local and international demand for goods and services and a temporary contraction of GDP, before growth recovered in the third quarter of 2009. More recently (2011) growth has slowed again.

During the period 1970 – 2010, the South African economy has undergone a process of restructuring, with pronounced shifts in the contributions of various sectors. In terms of relative contribution to GDP, the tertiary sector (services) grew by ~10%, an expansion which coincides with a contraction in the primary (agriculture, fishing and mining) and, to a lesser extent, secondary (manufacturing) sectors.

The most important industries in South Africa, from a contribution to GDP perspective, are (in order of importance) financial and other services, manufacturing, commerce, transport and communication and mining and quarrying.

In 2007, just fewer than 10 million people (out of a population of roughly 48 million) were formally employed in the South African economy. Following the onset of the recession, formal employment contracted by more than 250 000, or 2%, in the first half of 2009. The majority of job losses were in the less skilled sectors of the employment market.

Employment creation remains a major social and political challenge for the South African government and a period of sustained economic growth is required before significant gains in the job market will be achieved.

3.2.2 Regional Context: Eastern Cape Province

The Eastern Cape lies in the south-eastern portion of South Africa, bordered by the provinces of the Western Cape to the west (only ~120km from the project area), Northern Cape to the north-west (only ~90km from the project area), Free State to the north and KwaZulu-Natal to the east. Lesotho is to the north of the province, and the Indian Ocean to the south. The province occupies nearly 15% of South Africa's land area (~170 000km2) making it the second largest province in South Africa after the Northern Cape. The population of the Eastern Cape is ~6.75 million people, making it the

third most populous province in the country. The population density is about 40 people per km^2 (similar to the population density nationally).

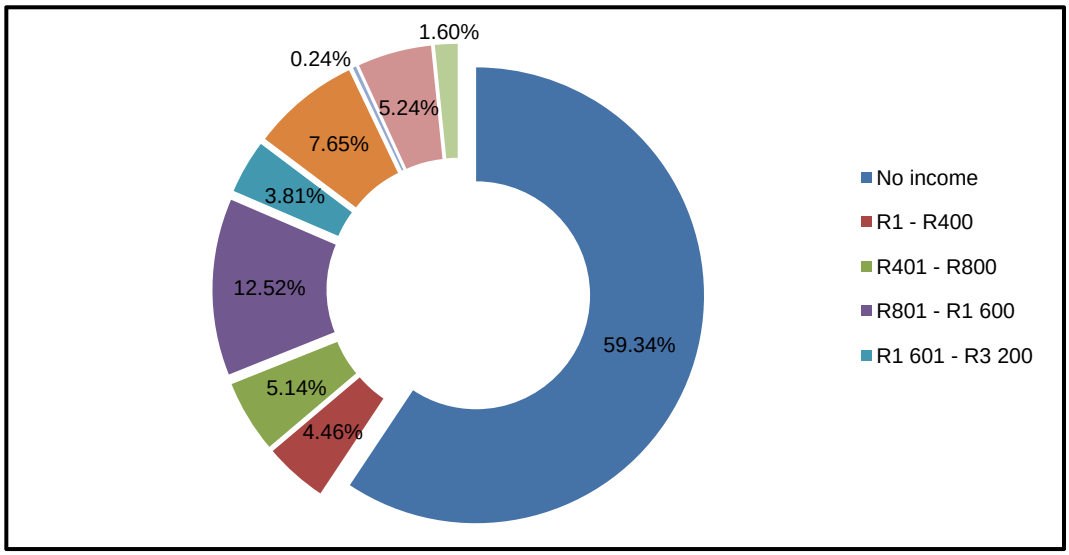
The Eastern Cape contributes approximately 7.8% to national GDP (2007). In 2007, the largest economic sectors were the 'finance, real estate and business services' (~20% of Regional Gross Value Added – GVA-R), 'general government services' (~18% of GVA-R) and 'manufacturing' (~16% of GVA-R). Mining and quarrying had the lowest contribution (0.2%) to GVA-R.

The Eastern Cape is a mountainous province. The west is mostly semi-arid Karoo, except for the temperate rainforest of the coastal Tsitsikamma region in the far south-west. The coastline is known for its rough seas and rugged rocky outcrops, broken up by the occasional beach. The region from East London towards KwaZulu-Natal, known as the Transkei, has lush grassland with occasional forest, set in rolling hills and deep gorges (Mediaclubsouthafrica, 2012).

Major towns in the Eastern Cape include Port Elizabeth and East London, both important harbours, and the provincial capital, Bhisho, inland near East London.

Overall, the economic situation of people in the province is very poor. The unemployment rate is high at close to 40% (40% of those people actively seeking employment were unable to find jobs for more than two months of searching). A full 47% of the population in this age group was not economically active in 2007 (StatsSA, 2007).

Correspondingly, ~60% of people aged 15 to 64 reported having no income, while the largest percentage of income earners received between R801 and R1 600 per month (see Figure 3-4).



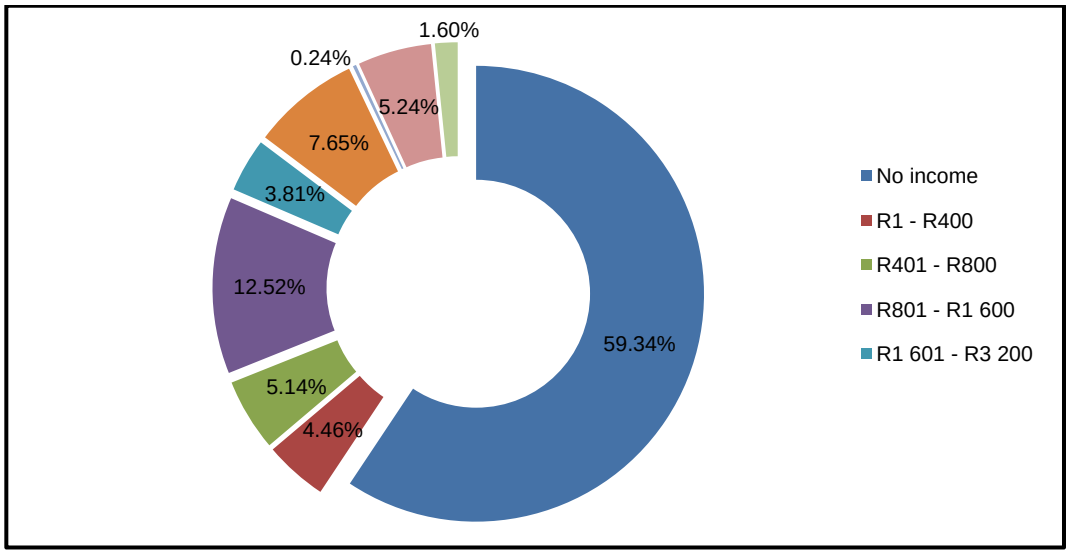


Figure 3-4: Income levels of people 15 - 64 years old in the Eastern Cape

Source: StatsSA (2007)

Approximately one third of the total population in the province received a social grant in 2007, which is higher than most other rural provinces of South Africa; most of these grants were child support grants, followed by old age pensions. The high contribution of government services to the provincial economy is a reflection of the level of public financial investment required to support the largely impoverished population.

In line with the low employment figures in the province, only 30% of the population aged 15 to 64 specified an employment sector; most of these are active within the 'community and social services', 'manufacturing and wholesale' and 'retail trade industries' (

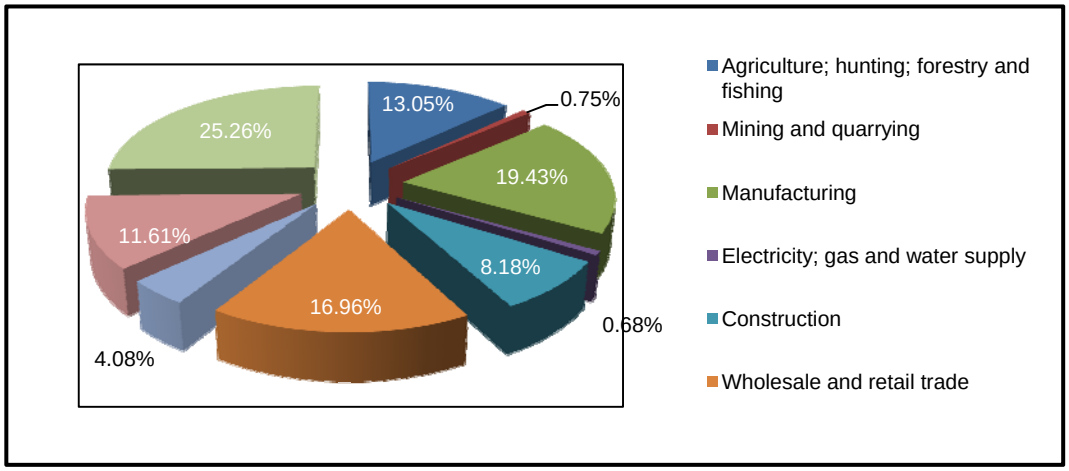


Figure 3-5).

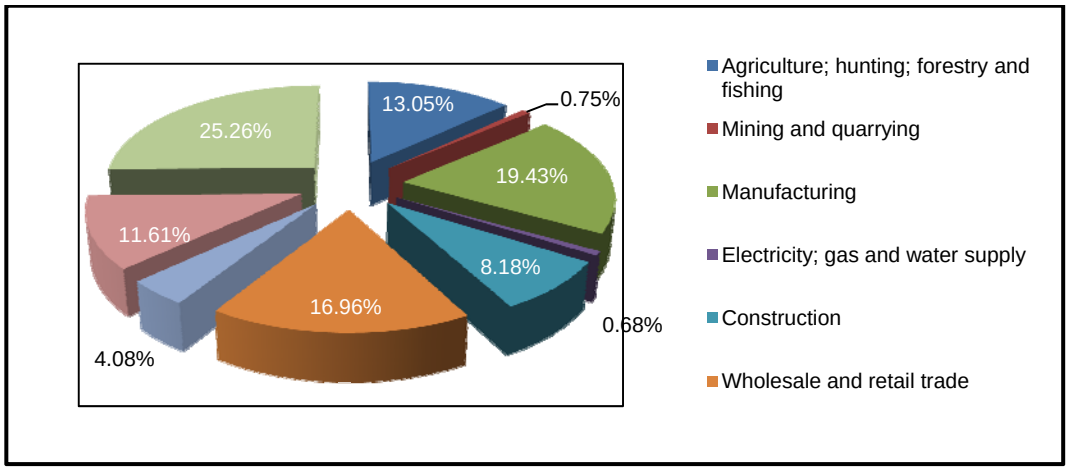


Figure 3-5: Employment sectors of people 15 - 64 years old who specified a sector

Source: StatsSA (2007)

4.3 Local Context: Inxuba Yethemba Local Municipality (IYLA)

The IYLA, within which Het Fortuin Farm 1/66 is located, is the westernmost municipality in the Chris Hani District Municipality.

It is located in the Eastern Cape Province ~240 km north of the Nelson Mandela Bay Metro and borders the Northern Cape Province to the west.

The local municipality is ~11 700 km2 in size. The main urban centres in the municipality are Cradock (including the communities of Lingelihle and Michausdal) and Middelburg (including the communities of Kwanonzame, Lusaka and Midros) which are connected by the N10 road – a vital regional economic link (IDP, 2011).

The following socio-economic baseline focuses on the IYLA.

Demographics

The total population in the municipal area remained stable between 2001 and 2007 .The majority of the population in the municipal area are of African descent (black people); however, the proportion of black people to other population groups declined between 2001 and 2007 (see Figure 3-7 possibly as result of outmigration driven by high unemployment in this population sector (see Table 3-3). There was an increase in the proportion of people of European origin (white people) over the same period.

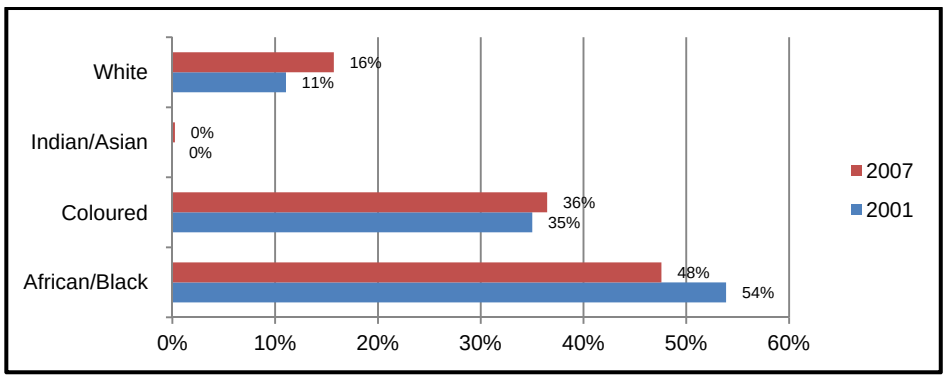


Figure 3-6: Population Distribution in the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Some 61% of the population of the INXUBA YETHEMBA LOCAL MUNICIPALITY are of a working age (2007), while ~31% are below the age of 15 and ~8% are over the age of 65

A decrease in the relative proportion of the population that is of working age between 2001 and 2007 is reflected in an increasing dependency ratio over the same period

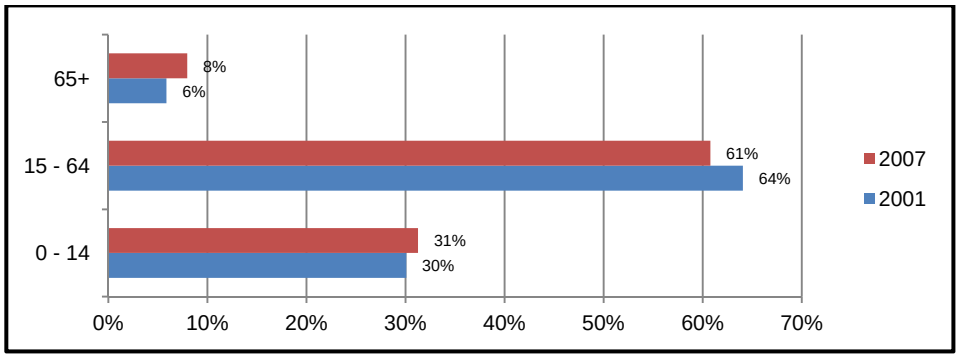


Figure 3-7: Age profile for the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

An increase in the dependency ratio indicates an increase in the dependency of the non-productive portion of the population on the productive, and therefore an increase in pressure on social services[1]. The increase in the dependency ratio over the reporting period for the local municipality is cause for concern as it remains significantly higher than the national average (~0.50). This indicates that government expenditure will have to focus proportionately more on social and community services as opposed to spending on more productive enterprises. This is likely to account for the relatively high government expenditure in the local economy (see Figure 3-13).

Table 3-3: Dependency ratio for the Inxuba Yethemba Local Municipality

Persons	2001	2007
Dependency Ratio	0.56	0.65

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Education

Almost 15% of the population over the age of 20 in the municipality have no formal schooling, and only ~30% have formal schooling at or above Grade 12 (see Figure 3-8).

Although somewhat concerning, low levels of formal education can be anticipated in a somewhat rural community, and education attainment has increased significantly between 2001 and 2007

Although there are schools in the municipality, significant distances must be travelled in order to access these facilities (located predominantly in Middelburg and Cradock) from rural areas.

[1] An increase in dependency can be a result of a number of factors, for example: increased health care improving life expectancy and decreasing deaths at child birth, out migration by the economically active workforce or illness such as HIV/Aids that tends to affect those between the ages of 15 and 64. Given the discrepancy in measured population numbers for the local municipality it is difficult to draw meaningful conclusions regarding the decline in dependency ratio.

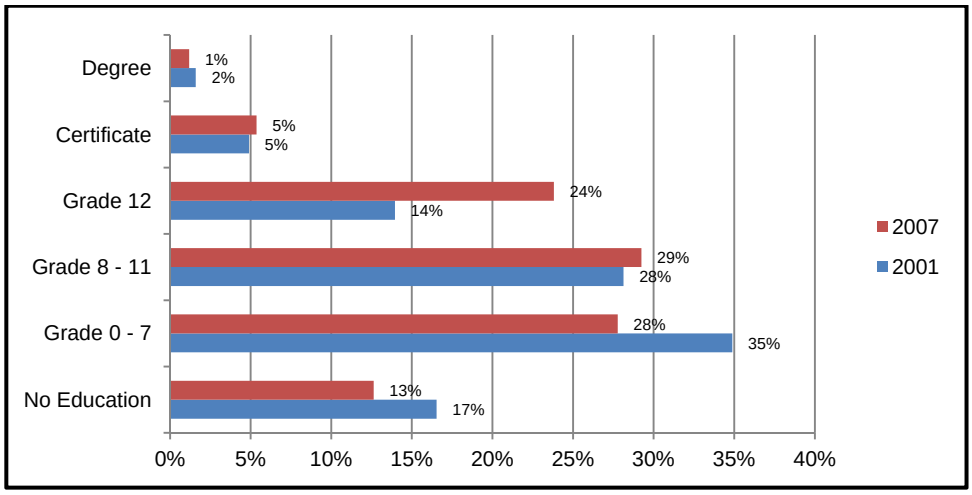


Figure 3-8: Education attainment for the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Income

Between 2001 and 2007, the proportion of people in the area that earned no formal income decreased from 64% to 45%, indicating an improvement in the general situation of the poorest members of the population. The decrease in persons earning no income corresponds with a marked increase in those persons earning between R800 and R1 600 per month – above the South African Government poverty threshold of ~R440 a month. The fact that ~65% of the population remain below this threshold is an indication of the social challenges facing the region (Figure 3-9).

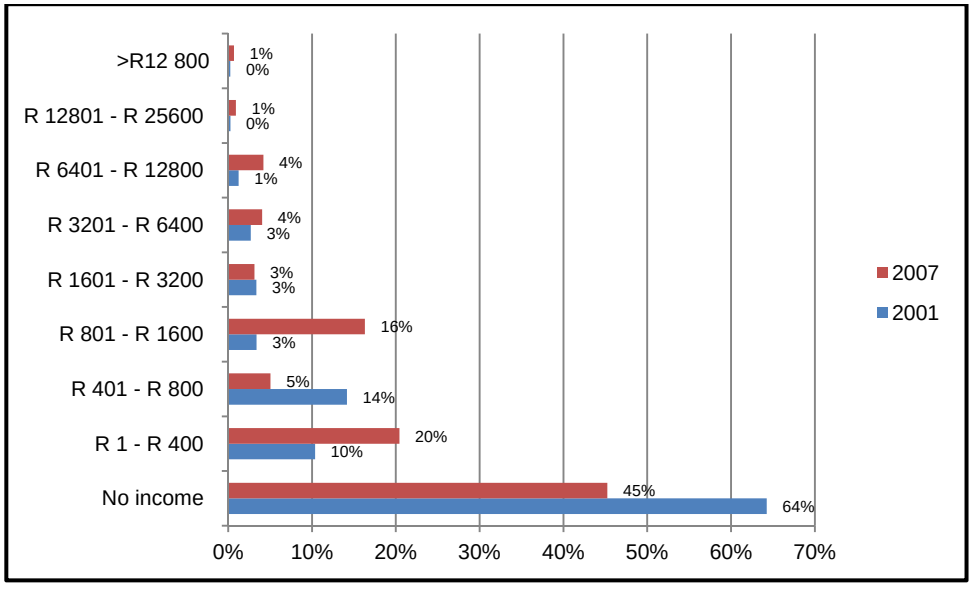


Figure 3-9: Monthly personal income categories in the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Household Types and Sizes

Housing is a basic human need and influences health, welfare and economic productivity of individuals. It is also a good indicator of the standard of living. To achieve the Millennium Development Goals, South African Government Policy is designed to ensure that its citizens live within good housing conditions. In order to achieve this goal, informal dwellings and bucket type toilets must be eliminated, and citizens must have access to electricity for lighting and to clean, safe water within a reasonable distance.

The number of formal households as a proportion of total households remained fairly stable over the reporting period (2001 – 2007) at ~97% (see Figure 3-10). The proportion of informal dwellings in the region has increased slightly from 0.7% to 1.81% of the total between 2001 and 2007. Although these figures indicate a favourable situation in terms of the provision of housing, high numbers of people per household, the poor condition of existing households and a backlog on the waiting list for housing indicates that challenges remain in this regard.

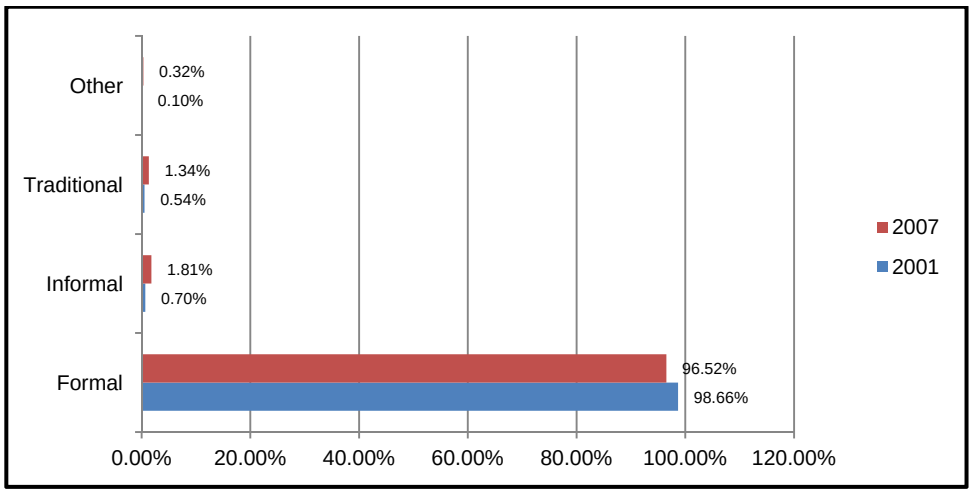


Figure 3-10: Household types in the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Access to Basic Services

The provision of basic services has improved in terms of water, electrical, sanitation and waste infrastructure development between 2001 and 2007 (see Figure 3-11). Each of these areas of service provision is discussed briefly here.

More than 90 of households have access to piped water on their property. Most of the remaining households, which are located predominantly in rural areas, have access to natural water, albeit below RDP standards (IDP, 2011). Water supply capacity is listed as a possible threat to future development, and additional supply sources need to be investigated to meet the demands of the growing population (IDP, 2011).

By 2007 more than 90% of the Inxuba Yethemba Local Municipality municipal population had access to flush toilets, and by 2010 access had been facilitated to the majority of the households without access to flush toilets (IDP, 2011). A consequent challenge as a result the development of infrastructure to meet the sanitary needs of the community (and therefore the increase in sewage load) is the required upgrade of municipal water treatment facilities and bulk sewer connections.

Although there was a significant increase in the number of households with access to electricity for cooking between 2001 and 2007, more than 20% were still not serviced in 2007. The Inxuba Yethemba Local Municipality is struggling to meet the demands of the growing regional population. Similarly to waste water infrastructure, electrical infrastructure needs to be upgraded urgently to meet the needs of the community (IDP, 2011).

By 2007 more than 10% of households were still required to dispose of domestic waste in their private capacity. Since 2007 there have been only marginal improvements in this regard. Waste management infrastructure in the IYLM is largely in a state of disrepair and urgently needs to be upgraded in order to meet the existing and growing needs of the community.

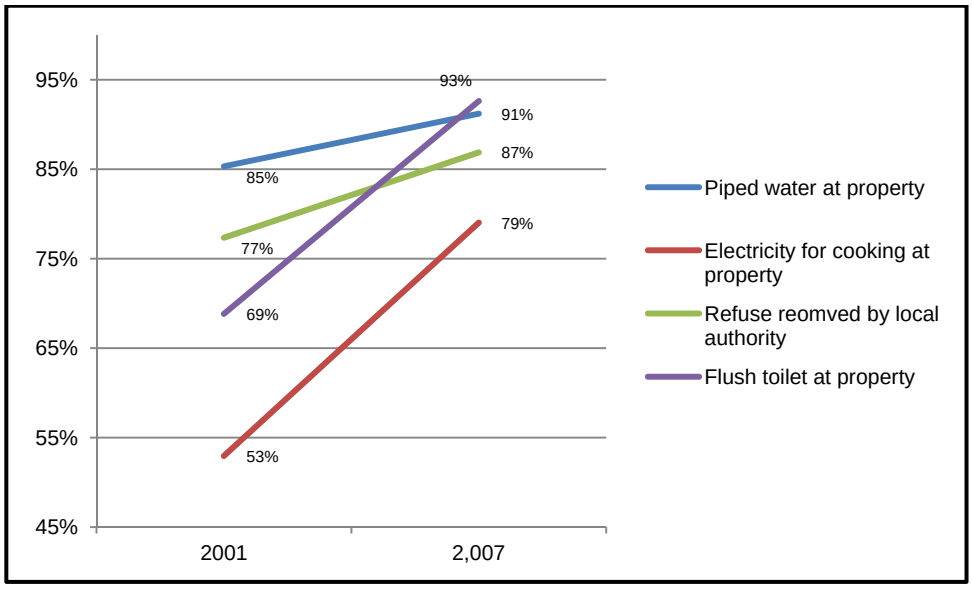


Figure 3-11: Access to basic services in the Inxuba Yethemba Local Municipality in 2001 and 2007

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

Crime

'Property related' and 'contact and aggravated' crime decreased in the period from 2007 to 2011, while 'drug and alcohol' related crime has steadily increased over the same period within the jurisdiction of the Cradock police station (within which the site falls) (see Figure 3-12).

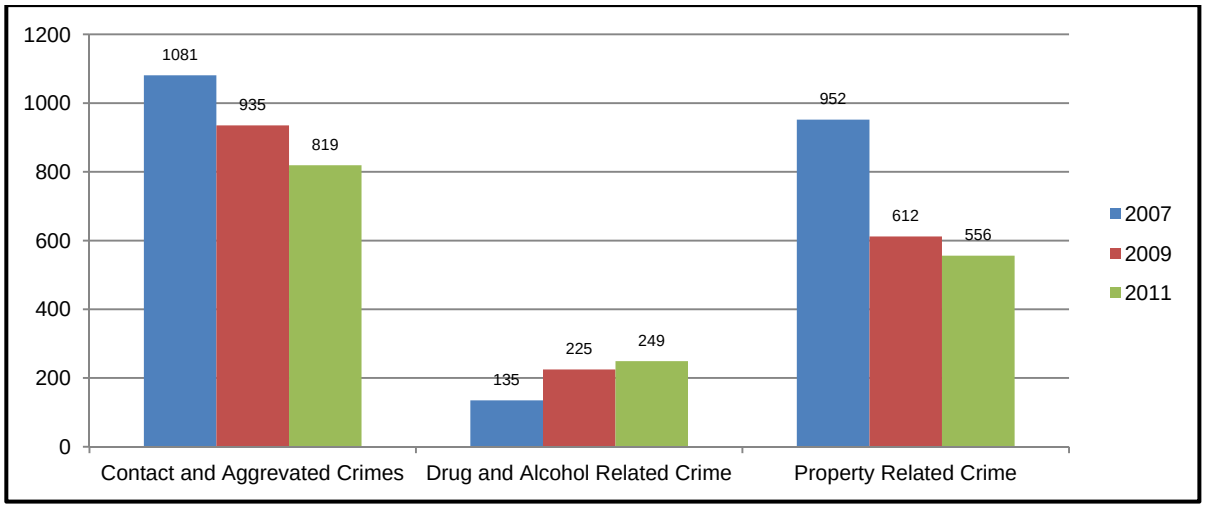


Figure 3-12: Crime statistics for the Cradock police station

Source: SAPS Annual Crime Statistics, 2011

Local Economy

The GVA-R for the Inxuba Yethemba Local Municipality was ~R1.9 billion in 2009. Figure 4 9 indicates the relative contribution of the various general industries to the GVA-R of the Inxuba Yethemba Local Municipality for 2008 and 2009. It can be seen that government services make up a significant portion of the local economy in 2009 and had increased in relative contribution from 2009, indicating that social welfare grants are increasingly relied on. Finance, insurance, business services and real estate plays an equally important role in GVA-R (particularly financial services in Cradock – IDP, 2011) albeit at a lower relative strength than in 2009.

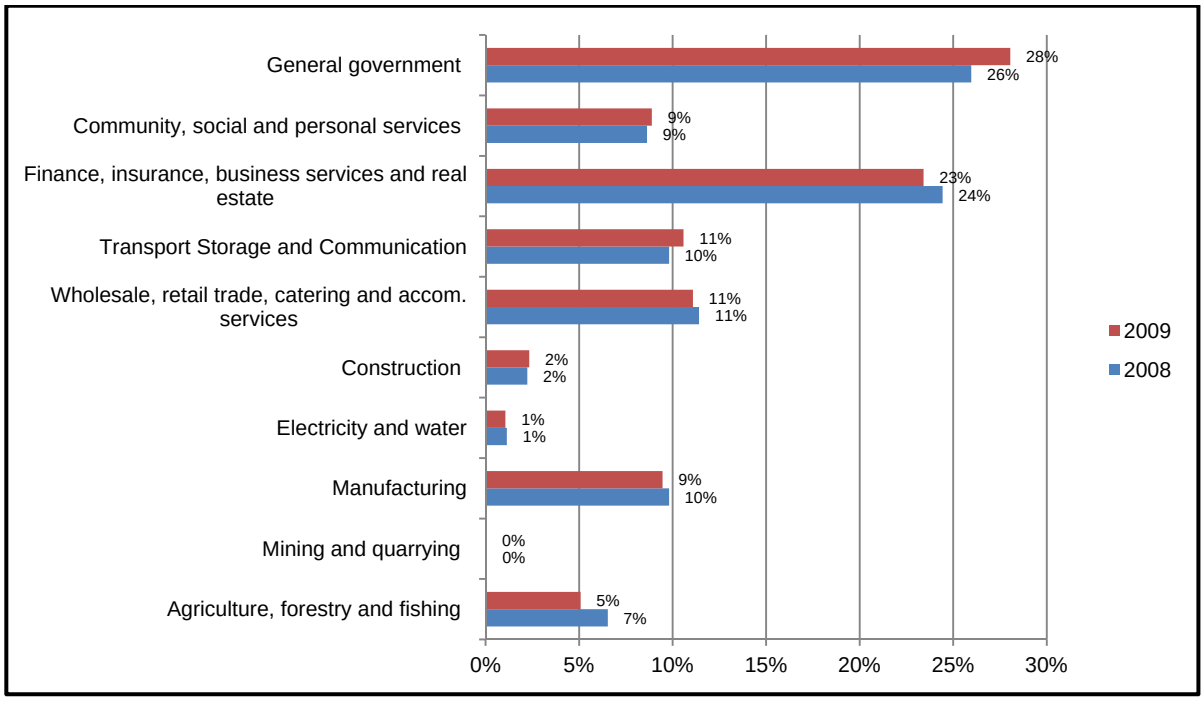


Figure 3-13: Contribution of various economic sectors to Inxuba Yethemba Local Municipality GVA-R in 2008 and 2009

Source: ECSECC (2010)

It is also likely that tourism plays an important role in the modest local economy given the relative size of the 'transport' and 'wholesale and retail trade, catering and accommodation' industries. Tourism in the Inxuba Yethemba Local Municipality is largely nature-based or associated with the rich heritage of the region (IDP, 2011). The character of the surrounding area is therefore an important aspect of the local economy. There are a number of guesthouses located in Cradock and Middelburg (IDP, 2011).

Local Employment

The Inxuba Yethemba Local Municipality has a particularly high unemployment rate of ~38% (see Figure 3-14) compared to the national average of ~20%. White people are employed at a much higher rate than people black and coloured people. Overall unemployment dropped in the Inxuba Yethemba Local Municipality between 2001 and 2007 by 5%.

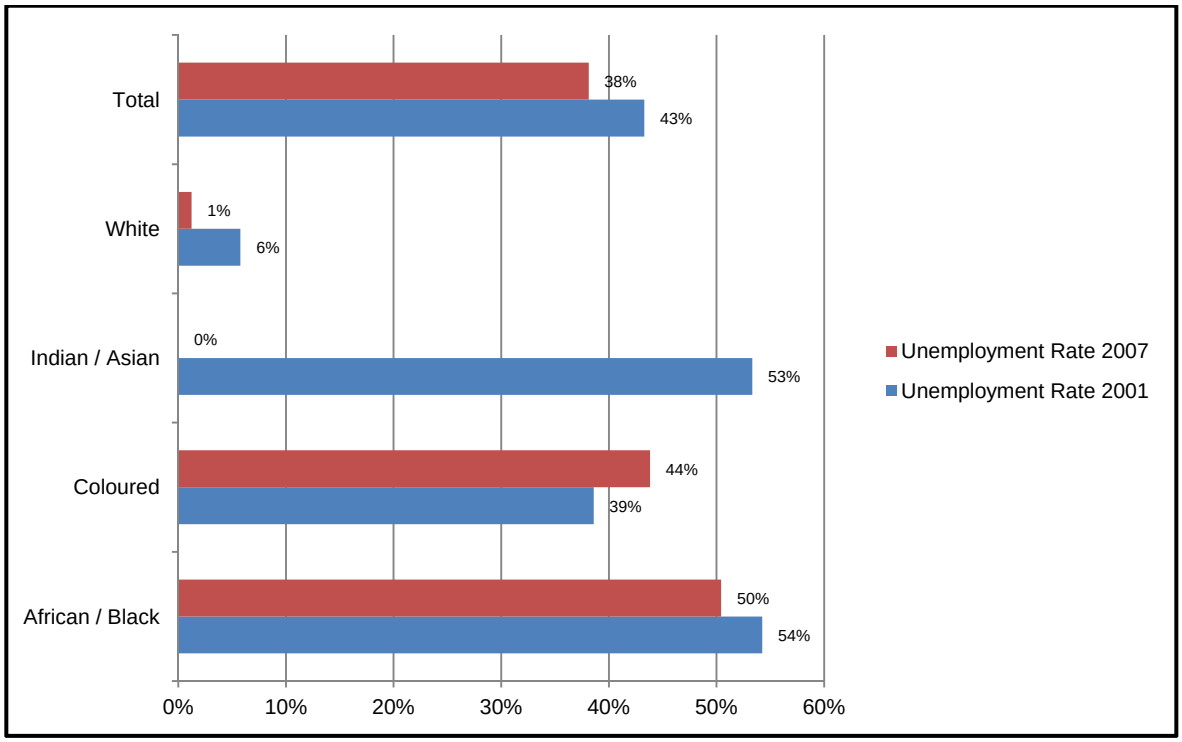


Figure 3-14: Unemployment in Inxuba Yethemba Local Municipality

Source: StatsSA Community Survey (2007)

The services sector employs the majority of the employed population (~29%). It is likely that government expenditure in community and social services accounts for the high proportion of employment in this sector (see Figure 3-15).

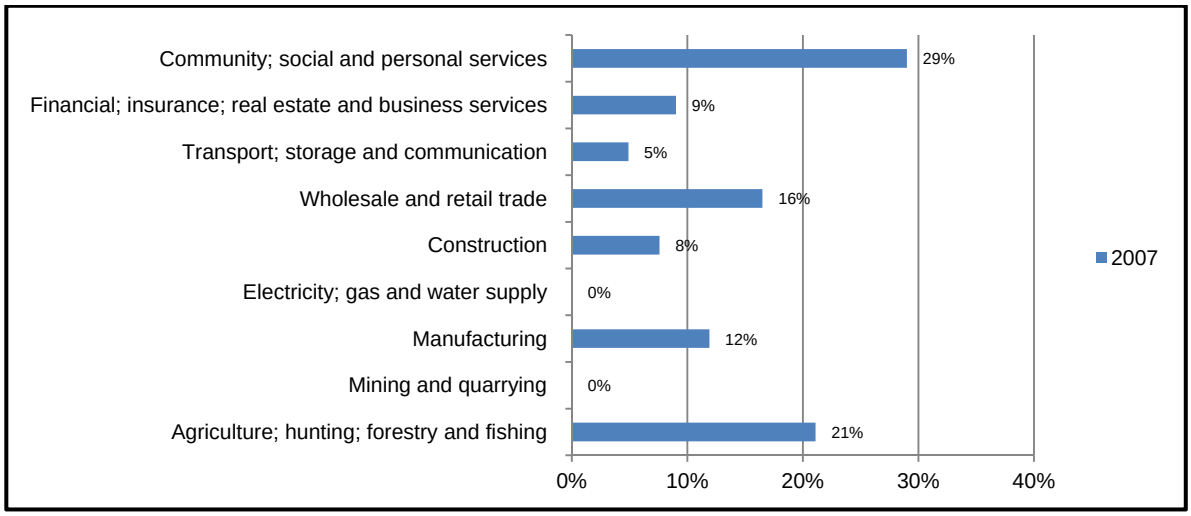


Figure 3-15: Sectoral employment in the Inxuba Yethemba Local Municipality

Source: StatsSA Census (2001) and StatsSA Community Survey (2007)

3.2.3 Historical and Cultural Environment

Het Fortuin Farm is located within the western extent of the Karoo Basin, one of the few basins worldwide in which the terrestrial fossil record, for the 45-million-year interval spanning the Permian and Triassic periods, is preserved and exposed (Golder, 2011).

Regionally, there are numerous remnants of Xam San archaeology and symbolic use of the landscape. Isolated scatters of stone tools are found in the plains, rock art sites are found in the mountains and shell middens are found along river banks, pans and floodplains (Prins, 2011).

Between 1200 and 1400 AD a global climatic fluctuation known as the Little Ice Age made the Karoo suitable for grazing, and as a consequence the remains of stone kraal complexes associated with the Koenkoen people are found in the region (Prins, 2011).

Between 1740 and 1787 Trekboers expanded into the Little Karoo and interior plateaux resulting in fierce conflict with the San people, and the eventual depletion of the San culture. Trekboers had to move regularly and homesteads associated with the Trekboer expansion close to springs and other water sources can be found at various locations in the region (Prins, 2011).

3.2.4 Baseline Environmental Value of the Site

Understanding the economic value of environmental goods and services provided by an area is useful to compare the environmental costs and benefits of a development. Such environmental goods and services can have a direct use value (e.g. if they are currently being exploited), an indirect use value (e.g. services derived from ecosystem functions such as water filtration), options value (resources that could be exploited in future) and non-use values (where people value the mere knowledge that an environmental resource exists).

The economic value of environmental goods and services related to the Dobbin solar farm site has not been quantified for this assessment, but pertinent observations are as follows:

- *Direct Use Value:* The site has a very low carrying capacity for livestock and due to the disturbed nature of the site, it is assumed that there is little direct use value for environmental goods and services.
- *Indirect Use Value:* The site, as part of the larger area, is likely to contribute to the recharge of surface (Great Fish River) and groundwater, which have economic value. The site also forms part of the landscape that is characteristic of the ‘sense of place’ of the region, which plays a role in the area’s tourism potential. Overall, the indirect use value of the site is considered to be very low.
- *Options Value:* No potential unexploited environmental resources (other than solar irradiation) on the site are known.

Non-Use Value: Given the lack of notable features of environmental, cultural or heritage significance associated with the site, there is little existence value.

4 Public Participation

The Public Participation Process (PPP) forms a key component of the EIA process. The objectives of the PPP are outlined below, followed by a summary of the approach taken, and the issues raised thus far.

4.1 Objectives and Approach

The overall aim of the PPP is to ensure that all Interested and Affected Parties (IAPs) have adequate opportunities to provide input into the process. More specifically, the objectives of the PPP are as follows:

- Identify IAPs and notify them of the proposed project and of the EIA process;
- Provide an opportunity for IAPs to raise issues and concerns; and
- Provide an opportunity for IAPs to review the Draft Scoping Report prior to its finalisation.

4.2 Public Participation Activities

The Public Participation Process that was undertaken to solicit public opinion regarding the proposed activity has included the following activities so far:

- Advertising of the EIA process in The Cradock Courant on 16 February 2012 and Die Burger on 21 February 2012 (see Appendix B);
- Placement of on-site posters – one at the entrance to the site and one on the boundary fence of the site (See photographs of the posters in Appendix B);
- Distribution of the Background Information Document (BID) to potential and registered Interested and Affected Parties (IAPs) and stakeholders. A copy of the BID is attached in Appendix C, and the register of IAPs is given in Table 4-1 below;
- Recording of all issues raised in response to the BID (See summary of issues raised and responses to these in Table 4-2;
- Original correspondence from IAPs in the Draft Scoping Report (see Appendix D);
- Preparation of a Draft Scoping Report;
- Distribution of the Executive Summary to all IAPs registered for this project;
- Compilation of issues raised in response to the Draft Scoping Report and integration of these comments into the Final Scoping Report (this report);
- Distribution of the Final Scoping Report to public venues for review by IAP's, and distribution of an executive summary to all IAP's registered for this project; and
- Submission of the Final Scoping Report (FSR) and the Plan of Study for the EIA to DEA for consideration and approval. Once approved, the EIA process can proceed to the detailed Impact Assessment phase.

4.2.1 Availability of Final Scoping Report

The Final Scoping Report (FSR), including the Plan of Study for EIA (POSE), has been submitted to DEA for approval. DEA will evaluate the FSR, including comments from IAP's, and either approve the POSE, or specify changes that need to be addressed in the EIR. After this, a Draft Environmental Impact Report (EIR) will be produced for further comment by IAP's.

The specialist study findings will be incorporated into the Draft EIR that will be open for public comment.

The Executive Summary of this Final Scoping Report has been distributed to all registered IAPs. Printed copies of this report are available for public review at the following location:

- Cradock Public Library.

SRK believes that the Final Scoping Report provides an accurate reflection of the public participation process and the issues identified. However, comments on the Final Scoping Report can still be sent to SRK, who will endeavour to consider these during the impact assessment phase of the study. Comments can be forwarded to:

Wanda Marais at SRK Consulting

PO Box 21842, Port Elizabeth, 6000

Email: portelizabeth@srk.co.za

Fax: (041) 509 4850

4.2.2 Issues Raised

IAPs have raised a number of issues and concerns regarding the proposed solar facility. Copies of written correspondence received from IAPs are provided in Appendix D. A list of registered and notified IAPs is given in Table 4-1, and the issues raised by IAPs to date are summarised in Table 4-2 and Table 4-3 below.

Table 4-1: Registered and Identified Interested and Affected Parties

Name & Surname	Organisation	Registered / Notified
Mncedisi Makosonke	Chris Hani Department of Economic Development , Environmental Affairs & Tourism	Registered
Ashley Starkey	Eastern Cape Department of Water Affairs	Registered
Carriot Kameni	Eastern Cape Department of Water Affairs	Registered
Ilse Viljoen	Eastern Cape Department of Water Affairs	Registered
Marisa Bloem	Eastern Cape Department of Water Affairs	Registered
Langa Zita	National Department of Agriculture, Forestry and Fisheries	Registered
Glen Thomas	Eastern Cape Department of Agriculture	Registered
Tetrus Kodisa	Eastern Cape Department of Agriculture	Registered
Samuel van den Berg	Eastern Cape Department of Mineral Resources	Registered
L Cloete	Eastern Cape Department of Mineral Energy	Notified
Janneke Abels	Shell Exploration and production B.V.	Notified
Phumla Ngesi	Petroleum Agency	Registered
Makagiso Moreeng	Petroleum Agency	Registered
Lennox Zote	Eastern Cape Provincial Heritage Authority	Registered
Mariagrazia Galimberti	South African Heritage Resources Agency	Registered
Mpilo Mbambisa	Chris Hani District Municipality	Registered
Noxolo Nontyi	Inxuba Yethemba Local Municipality	Registered
Mzwandile Tantsi	Inxuba Yethemba Local Municipality	Registered
Erasmus	Inxuba Yethemba Local Municipality	Registered
Derek Seaborne	Telkom	Registered
Johann Coetzee	Telkom	Registered
Leonard Shaw	Telkom	Registered
Anton Rautenbach	Telkom-Eastern Cape	Registered

Name & Surname	Organisation	Registered / Notified
Henry Dumont	Transnet	Registered
Dawid Theron	Transnet	Registered
Gilbert Notifiedrtier	Transnet Freight Rail	Notified
Richard Frank	Eskom	Registered
Tom Smith	Eskom	Registered
John Webber	Cradock Tourism	Notified
Lesley-AnnMeyer	Mountain Zebra National Park	Registered
Johan Van der Nest	Commando Drift Nature Reserve	Notified
Richard & Marion Holmes	Cat Conservation Trust	Registered
Trompie Vanrensburg	Central Karoo Agricultural Union	Notified
Petrus van Straaten	Fish River Farmers Union	Notified
Bradley Gibbons	African Crane Conservation Programme, Endangered Wildlife Trust	Registered
Fillipus Marais	Surrounding landowner (24/66) and (14/66, 15/66)	Notified
William Walker	Surrounding landowner (12/66) and Trustee of surrounding landowner Burnsides Trust (RE 592)	Notified
Johannes Le Roux	Surrounding landowner (18/66, 25/66, 38/66)	Registered
Hilton Collett Jnr	Trustee of surrounding landowner Retreat Trust (1/16)	Notified
Mr Andre Marais	Solar Facility Landowner (Portion 6 of Farm 66)	Notified
Mr Derek Seaborne	Telkom	Registered
Mr Dawid Theron	Area manager for Transnet Properties (27/66, 28/66, 29/66)	Registered

Table 4-2: Issues raised by Interested and Affected Parties in response to BID

Commentator	Comment / Issue Raised	Response
Mr Samuel van den Berg (Department of Mineral Resources)	A cursory check of our records did not show any mining or prospecting rights situated on the Dobbin site. For technical co-operation- and other rights and permits involving petroleum, you are advised to consult the Petroleum Agency in Cape Town.	SRK – comment noted. SRK has notified to Shell Exploration Company B.V. No response has been received.
Mr Samuel van den Berg (Department of Mineral Resources)	Please note that an application in terms of section 53 of the Mineral and Petroleum Resources Development Act, 28 of 2002 is required for Ministerial consent where land usage may be contrary to the objects of the Act. (A solar facility falls within such a usage).	SRK - Noted
Mr Johan Coetzee (Telkom Operational Manager)	Requirements to provide services (e.g. Telkom lines) to the development would need to be assessed if the project is approved. If authorisation is granted, specifications to install Telkom infrastructure will be provided and Telkom would need to make provision for	SRK - Noted

	lines.	
Mr Leonard Shaw (Telkom)	The follow comments regarding an exclusion zone of 100m around the Burnside microwave site. We have done an analysis of the proposed energy facility on our networks. Radio link run through the proposed area. It was not stated on the proposal were panels will be located, so it is assumed to be anywhere in the demarcated area. This demarcation was traced by hand from the poor quality print received. If a more accurate assessment is to be done an electronic file of the boundary is required (e.g. SHP or KML files). There must be an exclusion zone around the mast at BSD known as the near field zone. This is for any electromagnetic interfering equipment like solar panels or substations. The size of the zone is determined by the size of the antennas and the frequencies they operate at. Currently the zone is 100m for the existing links. However if other system are to be installed later this zone may need to be increased. Another very small risk arises. If the panel orientation happens to create an incident angel for interfering signals, the facility may reflect sufficient noise to degrade the links performance. This can be calculated if the size and orientation of all panels are known.	SRK – Noted. The co-ordinates of the broader area of the proposed facility have been sent to Telkom. It is anticipated that the actual solar facility footprint may be located approximately 600 m away from the Telkom Burnside Microwave Site.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Enquired whether the solar facility boundary would be fenced, and if so, would like to know the details of the area to be fenced as well as the height of the fence and what would be done to safeguard animals that venture in the solar facility area and are not able to get out.	SRK – A security fence will be installed around the boundary of the farm. The security fence will be diamond mesh, to a height of 3 m. The design of the fence is aimed at preventing access (including to animals) entering the site, and consequently, trapping of animals within the fenced area is considered unlikely. During the construction, measures to ensure animals aren't trapped will be implemented (fencing & construction activities from one side, providing opportunity for animals to escape).
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Enquired how power generated from the solar facility would be fed into the existing Eskom grid.	SRK – Underground power lines (of a medium voltage) will be installed from inverter substations to a central collector/ step-up substation. The step-up substation will be an outdoor substation with transformers to step up the medium voltage (either 22kV or 33kV) to High Voltage (HV) 132kV. A new 132kV overhead line (less than 1km in length) will be constructed and will run from the step-up substation to the Dobbin Eskom Substation which connects into the Eskom grid.
Mr and Mrs Richard Marion	Would like to know who would benefit	SRK - The solar facility will provide

Holmes (Cat Conservation Trust)	from the additional power generated by the solar facility.	electricity to the existing Eskom grid, thereby improving security of energy supply which would benefit the whole of South Africa. Benefits to the local community include job creation in the construction (300-400 workers) and operation phases (± 45 workers) of the development. Additional local community social benefit schemes (such as Job training and skills programs), linked to the development are also proposed.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Would like clarity on the location and direction of the overhead power line and enquired whether this would affect the flight path of any birds.	SRK – The location and direction of the proposed overhead power line is not yet known but will be determined in the EIA phase. An Avi-fauna Specialist has been appointed to assess the impact that the power line may have on birds
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Asked whether Af-Rom Energy is a South African company or a foreign company.	Af-Rom Energy is a registered South African company.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Would like clarification on the planned time span for the construction of this facility and details of where will these workers will be sourced from.	SRK – These details are provided in the project description.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Would like to know what the process of decommissioning the solar facility entails.	SRK – Infrastructure and equipment will be disassembled. All used or damaged solar panels will be returned to the manufacturer or recycled. All waste material will be removed entirely from the development area and disposed of at a registered landfill site.
Cllr Noxolo Nontyi (Inxuba Yethemba Local Municipality – Ward 6)	Is concerned about: • Potential air pollution impacts resulting from the proposed development; • Potential water pollution impacts resulting from the proposed development; and • Potential impact the proposed solar facility may have on surrounding facility land.	SRK – Air and water pollution preventative measures as well as measures related to impacts associated with surrounding land will be included in the Draft Environmental Impact Report and Environmental Management Programme.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Is concerned about the presence of rare or endangered endemic species on the proposed site and would like to know whether any survey of such species has been done.	SRK – The potential impact that the development may have on ecology of the study area, including the potential impact on rare, endangered or endemic plant species will be determined in the EIA phase. An Ecological Specialist Assessment was undertaken to assist with the assessment of potential ecological impacts.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	Would like to know whether methods employed to keep the area clean of vegetation after completion would have an impact on any species (i.e. flora and fauna) or underground water systems.	SRK – Mitigation measures to prevent contamination of underground water and destruction of flora and fauna species will be determined in the EIA phase.
Makagiso Moreeng	The proposed solar facility is situated inside an area allocated to Shell	SRK – comment noted. SRK has notified to Shell Exploration Company B.V. No

(Petroleum Agency)	Exploration Company B.V (12-3-221) Exploration Right Application.	response has been received.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	What chemicals will be used during the washing of the solar panels and how will this water be disposed of?	SRK – It is proposed that panels will be washed with water, including small amount of biodegradable detergent. The process is much like cleaning a window with a sponge. The balance of the water (after evaporation) will fall to the ground.
Mr and Mrs Richard Marion Holmes (Cat Conservation Trust)	It is mentioned that the water from the local aquifer will be used. Given that most of the water in this area have high levels of limestone and high EC, will this water be suitable for washing the solar panels without leaving residues or damaging them?	SRK – The quality of water from the local aquifer will be assessed by the hydo-geologist specialist in the EIA phase.
Marisa Bloem (Department of Water Affairs)	DWA expressed concern regarding the proximity of the solar facility watercourses on site and the impact on wetlands and other watercourses due to infrastructure (e.g. trenches carrying voltage cables) crossing these features. The Department advised that water use authorisation in terms of Section 21 (c) & (i) of the National Water Act (No. 36 of 1998) will be required if development occurs within the extent of any water courses. The Department requested the following additional information: • A wetland delineation and technical report reflecting wetland studies (Present Ecological State, Ecological Importance & Sensitivity Risk Assessment, Method Statement, Impact Assessment and Wetland Eco-services); • Description of the affected watercourses as well as assessment of the potential impacts of the proposed development and mitigation measures thereof; and • A layout plan indicating the location of the projects activities in relation to the 1:100 year floodline of affected watercourses, wetlands and 500 m radius mapped around wetlands.	SRK – Noted
Marisa Bloem (Department of Water Affairs)	Septic tanks have a significant impact on the quality of groundwater and they should therefore be assessed and investigated as part of the EIA process.	SRK – SRK will assess the impact of septic tanks on ground water in the EIA phase.

Table 4-3: Issues raised by Interested and Affected Parties in response to DSR

Commentator	Comment / Issue Raised	Response
Petrus van Straaten (Chairman of the Fish River Farmers Association)	The members of the Fish River Farmers Association are 100% in favour of the project and would like to recommend the implementation and completion of it as soon as possible.	SRK – Comment noted

Bradley Gibbons	Is concerned about the impacts that the proposed power line (from the site to the substation) may have on cranes and recommended that the power line be marked with bird flight diverters or flappers.	SRK – Comment noted. The potential impacts that the power line may have on birds will be assessed in the EIA phase. An Avi-fauna Specialist Assessment was furthermore undertaken to assist with the assessment of potential avi-fauna impacts.

4.2.3 Summary of identified environmental issues during the PPP

Based on the comments received from IAPs and the comments from the authorities, the following environmental issues have been identified:

- Potential impact of the proposed development on:
  - Telkom services (i.e. Burnside microwave site);
  - Habitat;
  - Rare/endangered/endemic fauna/flora species;
  - Groundwater sources from construction activities such as washing of panels and use of septic tanks;
  - Air quality;
  - Avi-fauna from the construction of an overhead powerline;
  - Fauna as a result of fencing and potential trapping effect; and
  - Wetlands.
- Socio-economic impacts of the proposed development, with specific reference to job creation potential;
- The suitability of local aquifer water for washing of solar panels;
- The potential waste management impacts associated with the decommissioning phase; and
- Potential impact that maintenance may have on vegetation during the operational phase of the proposed development.

5 Plan of Study for EIA

The identification of potential impacts of the proposed activity is based on the following factors:

- The legal requirements;
- The nature of the proposed activity;
- The nature of the receiving environment; and
- Issues raised during the public participation process.

Considering the factors listed above, the following environmental impacts were identified which could potentially result from the proposed solar facility:

- Archaeological and historical sites;
- Palaeontological sites;
- Ecological impacts;
- Avifauna impacts;
- Visual impacts;
- Agricultural impacts;
- Socio-economic impacts;
- Surface water impacts; and
- Construction related impacts including waste management and traffic.

The above listed impacts and their relevance to the proposed project area are described in more detail in the sections below.

5.1 Specialist Studies

A number of specialist studies are proposed in the Impact Assessment phase in order to investigate the potential environmental impacts associated with the proposed development. These are:

- Ecological Impact Assessment;
- Wetland Impact Assessment;
- Avifauna Impact Assessment; and
- Visual Impact Assessment.

The following impacts will be addressed by SRK in consultation with the project engineers:

- Traffic impacts;
- Surface and stormwater impacts;
- Waste related impacts; and
- Construction related impacts.

The following specialist input has already been obtained and no further input will be sought in the impact assessment phase (it is noted that further input may be required in the event of the project being authorised):

- Heritage Impact Assessment;
- Palaeontological Impact Assessment;
- Socio-economic Impact Assessment;
- Agricultural Impact Assessment.

5.2 Impact Rating Methodology

The assessment of impacts will be based on the professional judgement of specialists at SRK Consulting, fieldwork, and desk-top analysis. The significance of potential impacts that may result

from the proposed development will be determined in order to assist the Department of Environmental Affairs (DEA) in making a decision.

The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur. The criteria used to determine impact consequences is presented in Table 5-1 below.

Table 5-1: Criteria used to determine the Consequence of the Impact

Rating	Definition of Rating	Score
A. Extent– the area over which the impact will be experienced		
None		0
Local	Confined to project or study area or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) national	Nationally or beyond	3
B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment		
None		0
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. Duration– the time frame for which the impact will be experienced		
None		0
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years	3

The combined score of these three criteria corresponds to a Consequence Rating, as follows:

Table 5-2: Method used to determine the Consequence Score

Combined Score (A+B+C)	0 – 2	3 – 4	5	6	7	8 – 9
Consequence Rating	Not significant	Very low	Low	Medium	High	Very high

Once the consequence has been derived, the probability of the impact occurring will be considered using the probability classifications presented in Table 5-3.

Table 5-3: Probability Classification

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts will be determined by considering consequence and probability using the rating system prescribed in the table below.

Table 5-4: Impact Significance Ratings

Significance Rating	Possible Impact Combinations		
	Consequence		Probability
Insignificant	Very Low	&	Improbable
	Very Low	&	Possible
Very Low	Very Low	&	Probable
	Very Low	&	Definite
	Low	&	Improbable
	Low	&	Possible
Low	Low	&	Probable
	Low	&	Definite
	Medium	&	Improbable
	Medium	&	Possible
Medium	Medium	&	Probable
	Medium	&	Definite
	High	&	Improbable
	High	&	Possible
High	High	&	Probable
	High	&	Definite
	Very High	&	Improbable
	Very High	&	Possible
Very High	Very High	&	Probable
	Very High	&	Definite

Finally, the impacts will also be considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The system for considering impact status and confidence (in assessment) is laid out in the table below.

Table 5-5: Impact status and confidence classification

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, SRK's judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **Very Low:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **Low:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **Medium:** the potential impact should influence the decision regarding the proposed activity/development.
- **High:** the potential impact will affect the decision regarding the proposed activity/development.
- **Very High:** The proposed activity should only be approved under special circumstances.

Practicable mitigation measures will be recommended and impacts will be rated in the prescribed way both with and without the assumed effective implementation of mitigation measures. Mitigation measures will be classified as either:

- Essential: must be implemented and are non-negotiable; or
- Optional: must be shown to have been considered and sound reasons provided by the proponent, if not implemented.

5.3 Terms of Reference for Specialist Studies

The proposed Terms of Reference for each of the identified specialist studies are provided in this section.

5.3.1 Ecological Impact Assessment

The ToR for the specialist Ecological Specialist Study is to evaluate the two layout alternatives and the no-go option, in terms of:

- Impact on vegetation types and habitat;
- Habitat loss due to physical disturbance;
- The impact of increased shade and (marginal) increased water on vegetation type, species diversity and habitats;
- Comment on the acceptability of the two layout alternatives and no-go option

5.3.2 Avi-Fauna Impact Assessment

The ToR for the specialist Avi-Fauna Specialist Study is to evaluate the two layout alternatives and the no-go option, in terms of:

- The cumulative effect of the proposed overhead power line avi-fauna
- The cumulative effect of habitat loss on avi-fauna;
- Comment on the acceptability of the two layout alternatives and no-go option

5.3.3 Visual Impact Assessment

The ToR for the specialist Visual Impact Assessment is to evaluate the two layout alternatives and the no-go option, in terms of:

- The potential for, and significance of, reflections on train drivers;
- Refine viewshed and associated significance rating, for each of the layout options;
- Comment on the acceptability of the two layout alternatives and no-go option

5.3.4 Wetland Impact Assessment

The ToR for the specialist Wetland Impact Assessment is to evaluate the two layout alternatives and the no-go option, in terms of:

- The impact on wetlands and other watercourses due to infrastructure (e.g. trenches carrying voltage cables) crossing these features;
- Delineate wetlands on site and compile a technical report reflecting wetland studies (Present Ecological State, Ecological Importance & Sensitivity Risk Assessment, Method Statement, Impact Assessment and Wetland Eco-services);
- Describe the affected watercourses as well as assess the potential impacts of the proposed development and mitigation measures thereof; and
- Compile a layout plan indicating the location of the projects activities in relation to the 1:100 year floodline of affected watercourses, wetlands and 500 m radius mapped around wetlands.

5.4 Programme of Activities

The key activities and the provisional timetable required to achieve the objectives of the Environmental Impact Assessment study are summarised in Table 5-6 below.

Table 5-6: Impact status and confidence classification

Stage / Activity	Target Dates
Close of comment period on Draft Scoping Report	6 June 2012
Submission of Final Scoping Report and Plan of Study for EIA to DEA	7 June 2012
DEA approval of Plan of Study for EIA	7 August 2012
Conduct Specialist Studies and Compile Draft EIR	21 June 2012 to 21 August 2012
Issue Draft EIR for Public Comment	21 August 2012
Public Comment Period for Draft EIR	21 August 2012 to 30 September 2012
Prepare Final EIR	01 September to 12 September
Submit Final EIR to DEA for a decision	12 September 2012

5.5 Public Participation Process

The registered Interested and Affected Parties (IAPs) will be kept up to date on the progress by being notified of the availability of reports for comment. A public meeting to present the findings of the Draft EIR is not proposed.

6 Way Forward

The Final Scoping Report (FSR), including the Plan of Study for EIA (POSE), has been submitted to DEA for approval. DEA will evaluate the FSR, including comments from IAP's, and either approve the POSE, or specify changes that need to be addressed in the EIR. After this, a Draft Environmental Impact Report (EIR) will be produced for further comment by IAP's.

The specialist study findings will be incorporated into the Draft EIR that will be open for public comment.

The Executive Summary of this Final Scoping Report has been distributed to all registered IAPs. Printed copies of this report are available for public review at the following location:

- Cradock Public Library.

SRK believes that the Final Scoping Report provides an accurate reflection of the public participation process and the issues identified. However, comments on the Final Scoping Report can still be sent to SRK, who will endeavour to consider these during the impact assessment phase of the study. Comments can be forwarded to:

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Email: portelizabeth@srk.co.za

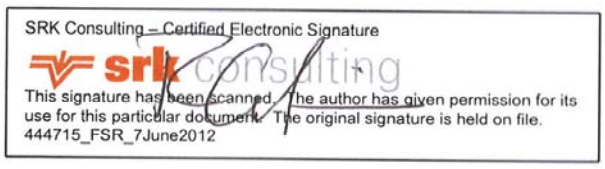
Fax: (041) 509 4850

Prepared by

Tammy Arthur (BSc (Hons)

Environmental Scientist

Reviewed by



Rob Gardiner Pr Sci Nat

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

7 References

Allan, K., Morris, M., & Murray-Rogers, A. (2012). *Visual Impact Assessment for the proposed photovoltaic solar farm, Dobbin, Eastern Cape.* Durban: SRK Consulting.

Almond, J. (2012). *Palaeontological Assessment: Proposed Dobbin solar farm on portion 1 of Farm Het Fortuin No. 66 near Cradock, Eastern Cape Province.* Cape Town: Natura Viva cc.

Booth, C. (2012). *A Phase 1 Archaeological Impact Assessment for the proposed 75 MW Dobbin photovoltaic solar farm on the Farm Het Fortuin 1/66, near Cradock, Inxuba Yethemba District Municipality, Eastern Cape Province.* Grahamstown: Albany Museum.

Bredenkamp, G., & Strohbach, M. (2012). *A vegetation and flora assessment for the proposed Dobbin 75 MW photovoltaic solar farm, Cradock, Eastern Cape.* Pretoria: EcoAgent cc.

Geyser, R., & Kemp, A. (2012). *Avifaunal Habitat Assessment of Cradock-Dobbin solar facility on the Farm Het Fortuin No.66.* Pretoria: EcoAgent.

Law, M., Reuther, S., & Dalgliesh, C. (2012). *Dobbin Solar Farm BA: Socio-economic Specialist Study.* Cape Town: SRK Consulting.

Phipson, J. (2012). *Agricultural Impact Assessment: Proposed photovoltaic solar farm: Dobbin: Cradock Local Municipality, Chris Hani District, Eastern Cape.* Kwazulu-Natal: Mzansi Agriculture.

Appendices

Appendix A: DEA Acknowledgement of receipt of EIA application

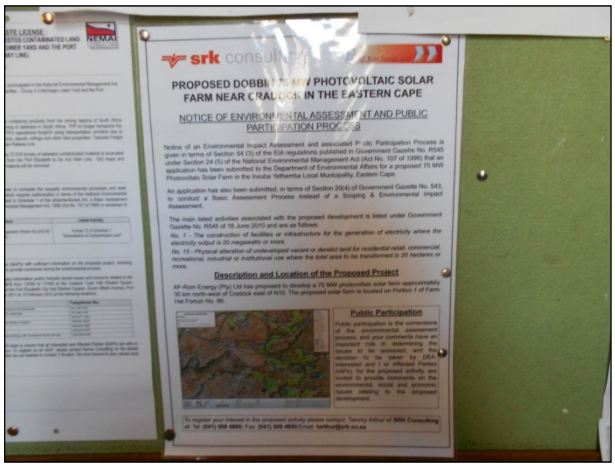
Appendix B: Proof of Public Participation

Adverts and photographs of on-site posters

B1: Poster on landowner fence adjacent to the access road to the site

B2: Poster on gate located close to the proposed site boundary

B3: Poster at the Cradock Library



B4: Close-up of poster at the Cradock Library

Appendix C: Background Information Document

Appendix D: Copies of IAP Correspondence

Appendix E: Site Maps

Appendix F: Site Photographs

Photo F1: Dobbin substation

Photo F2: Land north-west of Dobbin substation

Photo F3:Land north-east of Dobbin substation (note the powerline, railway line and agricultural land in the background)

Photo F4: Land south-east of Dobbin substation

Photo F5: Stone wall near the south-eastern corner of the site (near point G) looking towards point I

Photo F6: Animals spotted on south-eastern corner of the site (near point G)

Photo F7: Land south-west of point G looking towards point E

Photo F8: Land close to point I looking towards point E

Photo F9: Drainage line that running in a north-east to south-west direction across the site

Photo F10: Small dam at end of drainage line illustrated in Photo 9

Photo F11: Existing borrow pit outside of the site near south-western boundary

Photo F12: Land north of the existing borrow pit, near the south-western site boundary, looking towards point D

Appendix G: Facility Illustrations

Appendix H: EAP Declaration of Interest

SRK Report Distribution Record

Report No.	444715/5
Copy No.	

Name/Title	Company	Copy	Date	Authorised by
Thulisile Portia Nyalunga	National Department of Environmental Affairs	1-2	7 June 2012	R Gardiner
Mncedisi Makosonke	Chris Hani Department of Economic Development , Environmental Affairs & Tourism	3	7 June 2012	R Gardiner
Langa Zita	National Department of Agriculture, Forestry and Fisheries	4	7 June 2012	R Gardiner
Glen Thomas / Tetrus Kodisa	Eastern Cape Department of Agriculture	5	7 June 2012	R Gardiner
Kevin Filen	Af-Rom Energy	6	7 June 2012	R Gardiner
Katie Potgieter (Librarian)	Cradock Public Library	7		
SRK Johannesburg Library	SRK	8	7 June 2012	R Gardiner
SRK PE Library	SRK	9	7 June 2012	R Gardiner

Approval Signature: