

## SECTION E. RECOMMENDATIONS OF PRACTITIONER

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

YES	NO
-----	----

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

N/A

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

See below

Is an EMPr attached?

YES	NO
-----	----

The EMPr must be attached as Appendix F.

### A. SUMMARY OF THE PROPOSED DEVELOPMENT

InnoWind proposes to construct a 10 Mega Watt (MW) Photovoltaic (PV) solar energy facility on land located about 7 kilometres to the north of Peddie in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of the PV solar energy facility on about 18-19 Hectares (Ha) of land that is designated as communal land and which is currently used mainly for the informal grazing of livestock.

The Peddie 10 MW Solar PV project will also register to generate carbon credits in terms of the Clean Development Mechanism (CDM) under the Kyoto Protocol or other suitable carbon scheme.

It is anticipated that the footprint of the Peddie PV facility will cover an area of approximately 17 Ha, based on an expected footprint of 1.7 Ha per 1.0 MW array. Other associated infrastructure such as inverters and transformers, internal electrical reticulation, a storage facility and internal roads will contribute a further 1-2 Ha to the overall footprint. Therefore, the total transformed area is calculated to be at most 18-19 Ha in total.

The proposed development falls under the jurisdiction of Ngqushwa Local Municipality (NLM), in the Eastern Cape Province. The proposed PV facility will be connected onto the ESKOM grid via a XX kV power line to the Ngqushwa Local Municipality (NLM) Substation, adjacent to the site.

**Biological Environment** - See Ecological Assessment at Appendix D-2.

#### **Vegetation**

The PV layouts are situated predominantly in a vegetation type named “Great Fish Thicket” (Figure 1-12 below) in terms of the SANBI Vegetation map for the area (Mucina and Rutherford, 2006). A small corner section of Alternative PV2 has been described as “Bhisho Thornveld”, but the difference in vegetation was not visually apparent.

#### **Conservation Status**

### ***Subtropical Thicket Ecosystem Programme (STEP)***

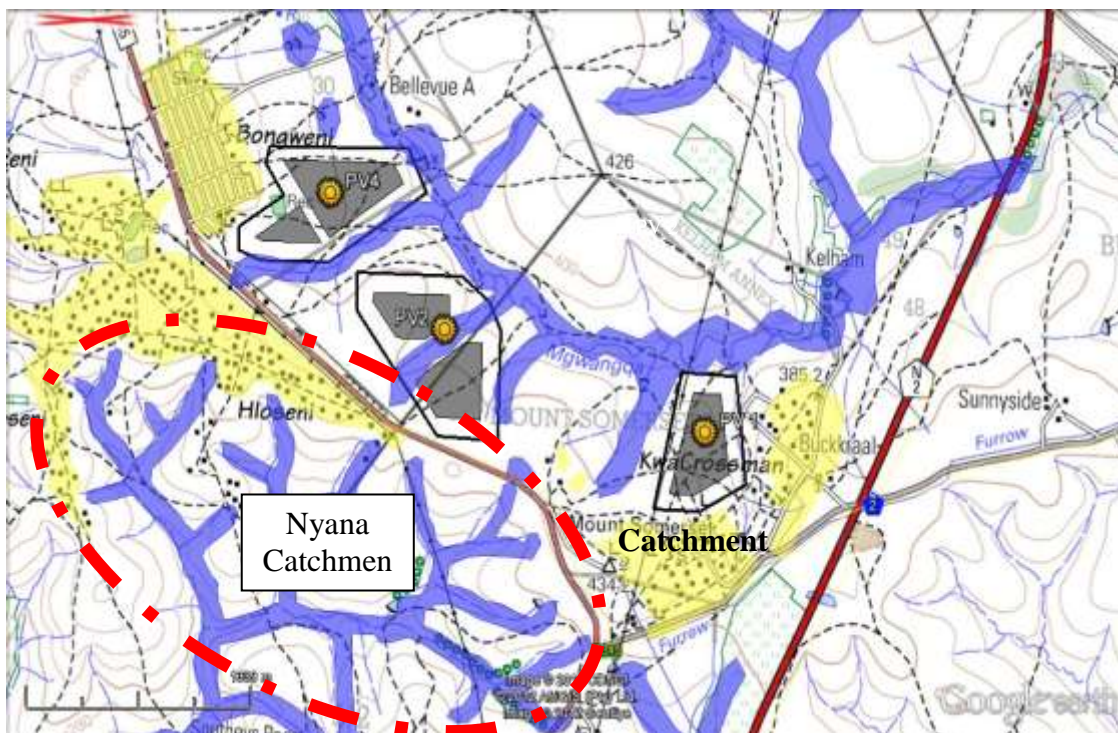
In terms of the STEP Conservation Priority map for the study area, most of the study area is classified as Class IV (currently not vulnerable) that can withstand a loss of or disturbance of natural areas through human activity or development.

### ***Eastern Cape Biodiversity Conservation Plan (ECBCP)***

In terms of the ECBCP for the area shows that most of the surrounding landform is categorised as a CBA 2 area, which requires that the land is maintained in a near natural state. As most of the surrounding areas are extremely degraded through years of cattle grazing, this status classification is not valid.

### **SENSITIVE ENVIRONMENTS**

Environmental sensitivity has been assessed by identifying the sensitive ecological or hydrological systems. These sensitive areas are shown in Figure 1-21 below.



**Figure 1-21 Sensitivity map for the proposed Peddie PV development. Blue = water bodies; Yellow = urban development; Red = existing power lines**

### ***Water bodies***

These areas are considered as highly sensitive and require specific mitigation to reduce the development impact on the natural environment.

The surrounding area consists of various drainage systems acting as catchments for the local river systems. The development footprint was designed to avoid these drainage systems (especially alternative PV2) and should not have an impact on them. Construction activities like work camps etc. must not take place within 32 meters of these drainage systems. If any construction activity – temporary or permanent – takes place within 32 meters of any water body, a Water Use Licence must be applied for as per Section 24 (c) & (i) of the National Water Act (No. 36 of 1998).

Existing power lines and their servitudes should be utilised to connect the proposed new PV yard to the Energy Grid. This is to reduce impacts on the Mgwangqa River catchment area

as shown in Figure 1-21 above.

## B. SUMMARY OF SIGNIFICANT IMPACTS

The following table provides a summary of the pre-mitigation impacts that were ranked as HIGH.

### Alternative 1: Preferred alternative - PV4 and also PV2

Impacts	Significance pre-mitigation	Significance post-mitigation
<b>PLANNING AND DESIGN</b>		
<b>Environmental Legal and Policy compliance</b> <ul style="list-style-type: none"> <li>- Failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.</li> </ul>	HIGH	LOW
<b>Environmental benefits</b> <p>There are other factors that contribute to the project's overall benefits such as:</p> <ul style="list-style-type: none"> <li>- The project contributes positively to climate change mitigation globally and a move to renewable energy.</li> <li>- The project has a small footprint where only the footings of the PV panels will require ground disturbance.</li> <li>- After the project is terminated, perhaps some 30 years in the future, the site can be rehabilitated to its original state.</li> </ul>	HIGH POSITIVE	HIGH POSITIVE
<b>Access to commonage grazing</b> <ul style="list-style-type: none"> <li>- The development will restrict access to the site and lead to a loss of grazing land for individuals utilising it as commonage. The site is grazed by a significant number of cattle of approximating 50 livestock units.</li> </ul>	HIGH	MODERATE
<b>Biodiversity planning compliance</b> <ul style="list-style-type: none"> <li>- Risk of PV layout and location of ancillary elements compromising or being inconsistent with objectives and land-use recommendations of biodiversity planning tools such as STEP and ECBCP.</li> </ul>	HIGH	MODERATE
<b>Soil erosion and sedimentation</b> <ul style="list-style-type: none"> <li>- Consistent, high impact water fall from the PV panels will result in direct soil erosion impacts below each panel.</li> </ul>	HIGH	MODERATE
<ul style="list-style-type: none"> <li>- Erosion beneath each panel may result in abrasive run-off storm water, which will continue to erode the soil between and downstream of the PV panels.</li> </ul>	HIGH	MODERATE
<ul style="list-style-type: none"> <li>- Large scale erosion will result in high storm water run-off containing a high sediment load. This will cause sedimentation in dams and downstream wetlands.</li> </ul>	HIGH	MODERATE
<b>Disturbance of sensitive areas</b> <ul style="list-style-type: none"> <li>- Erosion and degradation of water-courses and associated habitats due to poor planning and layout design (i.e. inappropriate utilisation of sensitive aquatic systems)</li> </ul>	HIGH	LOW
<b>CONSTRUCTION</b>		
<b>Loss of biodiversity</b> <ul style="list-style-type: none"> <li>- Loss of plant species of special concern</li> </ul>	HIGH	LOW

- Risk that runaway fires from cooking on the construction camp might lead to the burning of surrounding vegetation.	HIGH	MODERATE
<b>Socio-economic</b> - It is expected that 50 jobs will be created during the construction phase of the proposed development, in addition to use of other local services, suppliers and sub-contractors.	HIGH POSITIVE	HIGH POSITIVE
<b>OPERATIONAL</b>		
<b>Landscape &amp; visual</b> <i>Lighting</i> - The PV facility may be lit at night during operation which could have adverse impacts on the landscape character and sense of place due to long-term visibility of land by communities of Bongweni and eLalini.	HIGH	MODERATE
<b>Soil erosion and sedimentation</b> - Consistent high energy impact from rainfall runoff from the PV panels will result in localised erosion, which may result in larger soil erosion events across the study area, eventually culminating in large scale sedimentation of receiving water bodies.	HIGH	MODERATE
<b>Socio-economic</b> - It is expected that an estimated 20 direct permanent jobs will be generated for operating and maintaining the proposed PV facility.	HIGH POSITIVE	HIGH POSITIVE
<b>Climate change</b> - The electricity generated by the development will displace some of that produced by fossil fuel based forms of electricity generation. The scheme, over its lifetime, will therefore avoid the production of a significant amount of CO <sub>2</sub> , SO <sub>2</sub> and NO <sub>2</sub> that would otherwise be emitted to the atmosphere.	HIGH POSITIVE	HIGH POSITIVE
<b>DECOMMISSIONING</b>		
- Poor rehabilitation may result in limited re-vegetation and long-term ecological damage.	HIGH	LOW
<b>Soil erosion</b> - After the removal of all PV-related structures, the disturbed soils could become exposed, unstable and prone to erosion.	HIGH	MODERATE

## C. SPECIALIST STUDIES

### Visual Impact Assessment

Overall, it is concluded that the visual impact of the Peddie PV facility is: **MODERATE** – where it should have an influence on the decision unless it is mitigated, in which case recommended mitigation measures must be implemented.

### Ecological Impact Assessment

The ecological impacts of all the aspects of the proposed Peddie Energy PV Facility were considered and deemed to be ecological acceptable, provided that the mitigation measures provided in this report are implemented.

The ecological assessment also identified Alternative PV4 as the preferred option due to the following:

- Alternative PV2 are divided in 2 sections by a drainage system containing natural Great Fish Thicket vegetation.

### **Palaeontological Impact Assessment**

The palaeontological impact assessment makes the following recommendations based on the palaeontological sensitivity of the Koonap Formation, upon which the development is proposed:

- A permit for the collection and rescue of fossils from the Koonap Formation must be obtained from SAHRA.
- All earth-moving activities with potential impact are to be monitored by a palaeontologist. A monitoring report should be submitted to SAHRA after completion of the earth-moving activities.
- The resident ECO must also be trained by a professional palaeontologist in the recognition of fossils. If fossil material is later discovered it must be appropriately protected and the discovery reported to a palaeontologist for the removal thereof as per SAHRA legislation.

### **Agricultural Impact Assessment**

The agricultural impacts of all the aspects of the proposed Peddie Wind Energy Facility were considered and deemed to be acceptable, provided that the mitigation measures provided in this report are implemented.

As there are no centre pivots, irrigation schemes or active agricultural fields which will be influenced by the proposed development, no problematic areas or fatal flaws were identified for the site.

All the identified impacts on agriculture are considered to have high reversibility because the land will be able to be returned to agriculture after closure with very little change in agricultural potential. Impacts on agriculture are also considered to have low irreplacability of resource loss because:

1. of the small areas of land involved,
2. that it is highly unlikely to be irreplaceably lost to agriculture,
3. and that it is of low agricultural potential.

Because of the uniformity of soil conditions and agricultural potential across the site, there are **no preferred alternatives proposed**.

### **Heritage Impact Assessment**

Four heritage sites were observed during the survey, of which six require some form of mitigation. The main heritage site is an old milkwood tree that is a national monument dating to 1835. The monument is still in use by the Mfengu people who undertake annual visits to the site. The monument thus has an oral history and living heritage status attached to it as well as being of historical significance. The monument will not be visually affected by the PV sites. The historical and modern cemetery will have a visual impact. I suggested that the areas facing the PV sites are screened with indigenous trees and bushes.

## **D. CONSIDERATION OF ALTERNATIVES**

Initially, 4 alternative sites were identified for the proposed Peddie PV facility. PV3 and half of PV1 were eliminated due to the following reasons:

- PV1 (Section across the valley from KwaCrossman) is very difficult to access without significant impact of the environment.
- PV3 was located in an area of high biodiversity.

Thus, the following alternatives were assessed further as part of the BAR:

- A1 - Preferred alternative - development of the PV facility on the site designated as PV1A

- A2 – Alternative – development of the PV facility on the site designated as PV2
- A3 – Alternative – development of the PV facility on the site designated as PV4
- NO-GO or no development option

## **E. ENVIRONMENTAL IMPACT ASSESSMENT**

In terms of the environmental assessment, no significant impacts were identified that could not be adequately mitigated.

In addition, based on the assessment, the PV4 is the site preferred over PV1A and PV2:

- PV1A is very close to KwaCrossman village
- PV2 is intersected by a water course or drainage line which could be susceptible to erosion.

However, neither the PV1A nor the PV2 site is fatally flawed, and both should still remain an option.

Overall, the Peddie PV facility provides a number of benefits both locally and globally as follows:

- Stimulation of the local economy in terms of job creation, and the supply of goods and services to the PV facility both during construction and operation of the facility
- Provides a local supply of renewable energy as opposed to fossil fuel based electricity: and
- Contributes to climate change mitigation.

The No go option would mean abandoning the proposed development with the following implications:

- The loss of the benefits indicated above;
- The land in question would continue to be used for livestock grazing with the risk of overgrazing resulting in land degradation, loss of vegetation cover and associated impacts such as soil erosion, hardening of soil surface, invasion by alien species etc.

## **F. OPINION OF THE EAP**

Coastal & Environmental Services (the EAP) hereby provides the following opinion concerning the proposed InnoWind Peddie 10 MW Solar PV Facility:

The potential HIGH impacts of the proposed Peddie PV Facility can be summarized as:

### **PLANNING AND DESIGN PHASE**

- Biodiversity planning compliance
- Risks of soil erosion and sedimentation
- Disturbance of sensitive areas (e.g. water courses)
- Ongoing community access to commonage for livestock grazing

### **CONSTRUCTION PHASE**

- Loss of biodiversity due to uncontrolled activities and fires

### **OPERATIONAL PHASE**

- Exposed lighting during operations
- Soil erosion and sedimentation due to poor storm-water management

### **DECOMMISSIONING PHASE**

- Ecological damage and erosion due to poor rehabilitation after project closure.

Potential HIGH Positives of the project include:

- The project contributes positively to climate change mitigation globally and a move to renewable energy.
- The project has a small footprint where only the footings of the PV panels will require ground disturbance.
- After the project is terminated, perhaps some 30 years in the future, the site can be rehabilitated to its original state.
- It is expected that 50 jobs will be created during the construction phase of the proposed development, in addition to use of other local services, suppliers and sub-contractors.
- It is expected that an estimated 20 direct permanent jobs will be generated for operating and maintaining the proposed PV facility, in addition to use of other local services, suppliers and sub-contractors.
- The project will contribute to climate change mitigation

**It is the opinion of Coastal & Environmental Services that NO FATAL FLAWS are associated with the proposed InnoWind Peddie 10 MW Solar PV Facility and that all impacts can be adequately mitigated to reduce the risk or significance of impacts to an acceptable level.**

Lastly, it is also the opinion of CES that this Basic Assessment Report contains sufficient information to allow DEA to make an informed decision. CES therefore recommends that the application for Authorisation should be approved on condition **that the recommended mitigation measures stated herein are effectively implemented.**

## **E. MITIGATION MEASURES**

The following mitigation measures are recommended:

### **DESIGN AND PLANNING PHASE**

#### **Environmental Legal and Policy compliance**

- The planning and design of the PV should comply with all relevant legislation and policies, e.g.:
  - o Local and District Spatial Development Frameworks (i.e. Nqgushwa LM and Amathole DM)
  - o Eastern Cape Biodiversity Conservation Plan (ECBCP)
  - o NLM Strategic Environmental Assessment (SEA)
  - o NLM By-laws pertaining for waste management, etc.
- In addition, planning for the construction and operation of the proposed PV facility should take into account and consider any available best practice guidelines.

#### **Biodiversity planning compliance**

- Locating the PV arrays on identified critically endangered biodiversity areas must be avoided.
- There must be no development within 32 metres of any watercourse, preferably 50 metres.

#### **Ongoing access to commonage for livestock grazing**

- Continue to engage with local communities of Bongweni and eLalini concerning grazing to ensure that there is a clear understanding concerning the future limitations on access to grazing in future.

#### **Internal roads**

- It is strongly recommended that internal roads should comprise strip roads to

- maintain ecosystem integrity as much as possible.  
Strip roads should not be tarred and should make appropriate use of concrete blocks.
- Limit the number of strip roads on site to minimise their overall footprint.

#### **Loss of indigenous vegetation**

- An Environmental Control Officer must be incorporated into the detailed planning and design of access roads and associated infrastructure in order to minimise the disturbance of natural vegetation for the development of the solar facility.
- All species of special concern, protected or vulnerable must be avoided or transplanted
- Rehabilitation with grasses found on site, in addition to local shade-loving grasses, must be undertaken

#### **Soil erosion and sedimentation**

- Rainwater run-off must be captured and released through lower energy mechanisms.
- Rainwater harvesting could be considered
- Guttering and localise water flow dissipation mechanisms could be implemented
- An Erosion Control Plan must be developed and implemented.

#### **Disturbance of sensitive areas**

- Ensure that a buffer zone of 32 metres is maintained. There must be NO development activities may occur within this area 32 metres of a water course, but preferably 50 metres.
- Water courses should be rehabilitated by careful removal of the alien invasive vegetation.
- Ensure that any development of PV arrays or other infrastructure is located well away from the drainage line (at least 50 -100 metres)

#### **Landscape & visual**

- The PV facility must be designed to minimise visual intrusion.
- Planning for the layout of the PV facility must ensure that the impact of PV cell reflections on the receiving environment, including on people in the vicinity, that is, neighbouring communities at Bongweni and eLalini, is minimized.
- The project developer must where feasible, use panels that minimise light reflection

#### **Visual impacts associated with PV2 and PV4**

- Implement visual impact mitigatory measures as indicated at concluding section
- Only non-reflective PV panels must be employed
- Colour of above ground infrastructure (including PV panels) to be sympathetic to the landscape character (preferably greys)
- Underground cabling to be utilised where possible
- All exterior lighting must be shaded and directed downwards
- The design and location of ancillary works are to incorporate measures which will reduce their visual impact.
- Visual screen planting is a beneficial mitigation method used to assist in the reduction of the PV facility visual impact. Visual screen planting can be undertaken in the form of boundary planting around the solar farm, foreground planting at affected viewpoints and residential tree planting.
- The selection of endemic species would enhance the existing landscape character, and be a seen as a continuation of the existing vegetation.

#### **Cultural heritage & archaeology**

- No significant heritage, archaeological or paleontological objects have been identified on site.

#### **Internal roads**



- It is recommended that strip access roads should be used to maintain ecosystem integrity as much as possible.
- Strip roads should not be tarred but should make use of concrete blocks.
- Limit the number of strip roads on site to minimise their overall footprint.

#### **Storm water**

- A storm water management plan must be developed and implemented

#### **Sewage**

- Although limited in scale, septic tanks or other sanitation system must be located well away (at least 50 metres) from any water course or drainage line.

#### **Socio-economic**

- Continue to engage with local communities of Bongweni and Elalini concerning grazing.

#### **Surface water run-off**

- The PV facility Must be located at least 32m away from the identified drainage line.
- A Storm Water Management Plan must be designed and implemented to ensure maximum water seepage at the source of water flow. The plan should also include management mitigation measures for water pollution, waste water management and the management of surface erosion e.g. by considering the applicability of contouring, etc.

#### **Storage of Hazardous substances**

- All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.
- The developer must designate appropriate areas for the storage of hazardous substances.

#### **Management of general waste**

- A waste management plan for handling on site waste must be developed and implemented
- An appropriate area where waste can be stored before disposal must be designated.

#### **Avifauna**

- If feasible, consider installing underground cables to link the PV facility to the Ngqushwa substation.

#### **Noise**

- Measures must be put in place to mitigate the impacts of noise during the operational phase of the project, e.g. Consider housing the equipment in enclosed structures.

### **CONSTRUCTION PHASE**

#### **Dust generation**

Nuisance dust must be mitigated by implementing the following:

- Damping down of un-surfaced and un-vegetated areas;
- Retention of vegetation where possible;

#### **Loss of biodiversity**

##### *Construction camp*

- The appointed ECO must assist in sighting of structures and supervise any vegetation clearing (although this is not anticipated) for the construction camp.
- Construction camp should be fenced to avoid sprawl.

#### *Vegetation clearing*

- Vegetation clearing must be restricted to the identified sites for the construction camp, cement mixing circle, ancillary infrastructure lay down areas, underground power cable route, control cabin and other activities on site that have been identified as necessary for development of the project. There must be no unnecessary disturbance of natural vegetation
- Where unavoidable, such disturbed areas must be rehabilitated.
- Implement a worker environmental education program and implement best management practices.

#### *Access roads*

- Construction vehicles and machinery should only access the site using the existing R345 to the south of PV2 and PV4 to minimise disturbance on the receiving environment.

#### *Alien and invasive species*

- Alien plants must be removed from the site through appropriate methods e.g. hand pulling, chemical, cutting etc. Under supervision from the ECO.
- Disturbed areas must be rehabilitated.

#### **Loss of vegetation during construction**

- Construction activities must be limited to the designated development footprint. i.e. construction materials, vehicular storage, construction camps etc, must occur in a demarcated area that will ultimately be developed as part of the facility.
- Actual installation should be undertaken with minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation.
- Roads located on slopes must incorporate storm water diversions.
- Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and re-vegetation must be undertaken
- Construction activities must be demarcated and vegetation clearing and top soil removal (if required) limited to these areas.
- The development area must be surveyed prior to topsoil removal (if required) during construction in order to locate protected geophytic plant species and transplant them into the neighbouring undeveloped environment.

#### *Fire hazard*

- There must be no burning of construction waste or debris onsite.

#### **Cultural heritage & archaeology**

- Should substantial archaeological and paleontological remains be exposed during construction, the ECO must alert SAHRA so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional archaeologist and/or palaeontologist.

#### **Noise**

- Machinery that causes noise must only be operated at appropriate times (during the day and at normal working hours).

#### **Waste management**

- An EMPr incorporating waste management issues during the construction phase of the project must be developed and implemented.
- Ensure that all excess waste is disposed of at an appropriately licensed landfill site.
- Littering must be avoided and litter bins should be made available at various strategic

points on site.

- Refuse from the construction site must be collected on a regular basis and deposited at an appropriate landfill.

#### **Storage of hazardous and other substances and materials**

- All construction materials must be stored in a central and secure location with controlled access with an appropriate impermeable surface.
- No storage of fuels and hazardous materials must be permitted near sensitive water resources.
- All hazardous substances (e.g. diesel, oil drums etc.) must be stored in a bunded area.

#### **Storm water management**

- Ensure that the recommendations of the Storm Water Management Plan are implemented to mitigate the impacts of run-off water on pollution.
- Ensure adequate storm water management by implementing recommendations of the Storm Water Management Plan during construction.
- Ensure that the recommendations of the storm water management plan are implemented to avoid soil erosion and siltation of drainage line.

#### **Erosion**

- No earthworks are to occur within 32 m of the drainage line so as to reduce the risk of erosion.

### **OPERATIONAL PHASE**

#### **Landscape & visual**

##### *Lighting*

- Night lighting impacts must be reduced by using shaded lighting and using lights at low levels.

#### **Disturbance to biodiversity**

##### *Maintenance and cleaning activities*

- Access to the site should be limited to the existing R345 that runs past the southern boundaries of the PV2 and PV4 sites.
- Access within the site should be restricted to the tracks established during the construction phase.
- A worker environmental education program must be implemented.

#### **Soil erosion and sedimentation**

- Rainwater run-off must be captured and released through lower energy mechanisms.
- Rainwater harvesting should be considered.
- Guttering and localise energy dissipation mechanisms should be implemented
- An Erosion Action Programme must be developed and implemented.

#### **Storage of chemicals, herbicides etc.**

- All hazardous substances must be stored in appropriately bunded locations.

#### **Noise**

##### *Maintenance and cleaning*

- Panel cleaning activities must be limited to daytime and within normal working hours.

##### *Operating equipment*

- Lower noise emission levels from inverters and transformers can be achieved by housing them in enclosed structures.

### **Increased storm water run off**

#### *Storm water management*

- A Storm Water Management Plan must be developed and implemented.
- Vegetation should be retained where possible to avoid soil erosion.
- Disturbed surfaces must be re-vegetated immediately after the construction activities are completed to encourage water seepage.

### **General pollution**

#### *Hazardous waste disposal*

- Damaged and used PV cells must be characterised and disposed of at hazardous waste site as necessary.

#### *Waste management*

- A waste management plan incorporating recycling and waste minimization, must be developed and implemented, including a worker education plan for waste management in the work environment.

## **DECOMMISSIONING PHASE**

### **Loss of biodiversity**

#### *Vegetation clearing*

- Deconstruction vehicles and machinery Must make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.

### **Loss of vegetation during decommissioning of the PV site**

- Decommission activities must be limited to the designated development footprint.
- Actual removal of the panels should be undertaken with minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation.
- Re-vegetation of exposed soil must be undertaken.
- Rehabilitation must be undertaken in the following phases:
- Applying topsoil and re-landscaping the area to its original condition if modified
- Stabilising the soil with synthetic materials or a fast growing plant species
- Re-vegetate with plants grown from seed or cuttings from the surrounding vegetation.

#### *Alien and invasive species*

- All bare land must be rehabilitated after decommissioning.
- An alien management plan must be developed for the decommissioned site.

### **Noise**

- Machinery that causes noise must only to be operated at appropriate times (during the day and at normal working hours)

### **Soil erosion**

- After the removal of all PV structures, the disturbed soils must be re-vegetated to avoid unnecessary soil erosion.
- There must be ongoing monitoring of the rehabilitation for 2 years after site decommissioning

### **General pollution**

#### *General Waste management*

- All excess waste must disposed of in the licensed landfill site.
- There must be no burying or burning of construction waste or debris onsite

*Hazardous Waste management*

- All hazardous waste must be classified and disposed of at an appropriate landfill.

## **SECTION F: APPENDICES**

The following appendixes must be attached as appropriate:

**Appendix A: Site plan(s)**

**Appendix B: Photographs**

**Appendix C: Facility illustration(s)**

**Appendix D: Specialist reports**

- D-1 - Heritage Impact Assessment
- D-2 – Ecological Impact assessment (CES)
- D-3 – Visual Impact Assessment (CES)

**Appendix E: Comments and responses report**

**Appendix F: Environmental Management Programme (EMPr)**

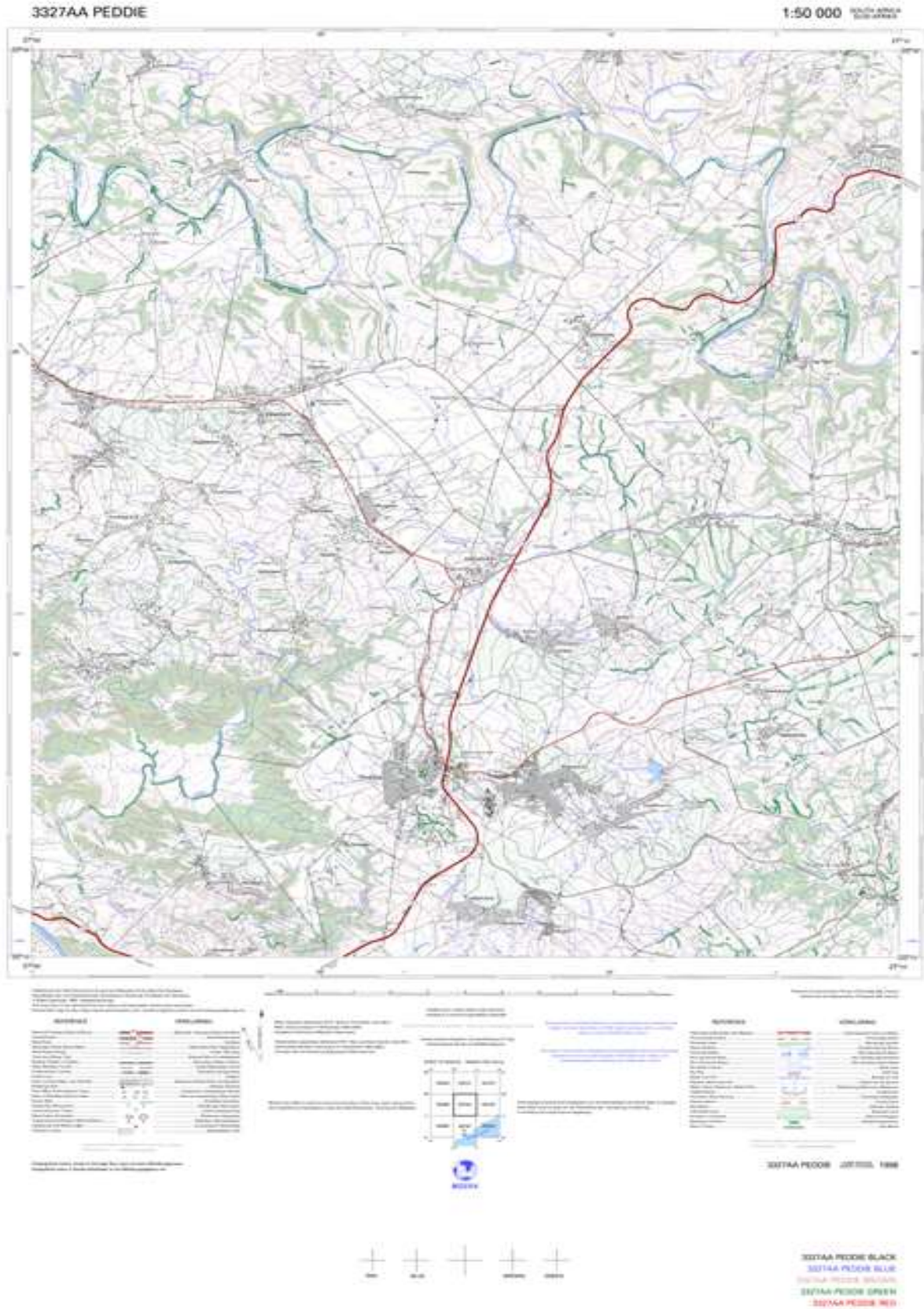
**Appendix G: Stakeholder engagement information**

**Appendix H: Methodology for assessing the significance of impacts**

**Appendix J: Solar PV visual impact assessment case study**

## APPENDIX A

### Site Plans



**Figure A-1: 1:50 000 map of the study area (Ref: 3327AA PEDDIE)**



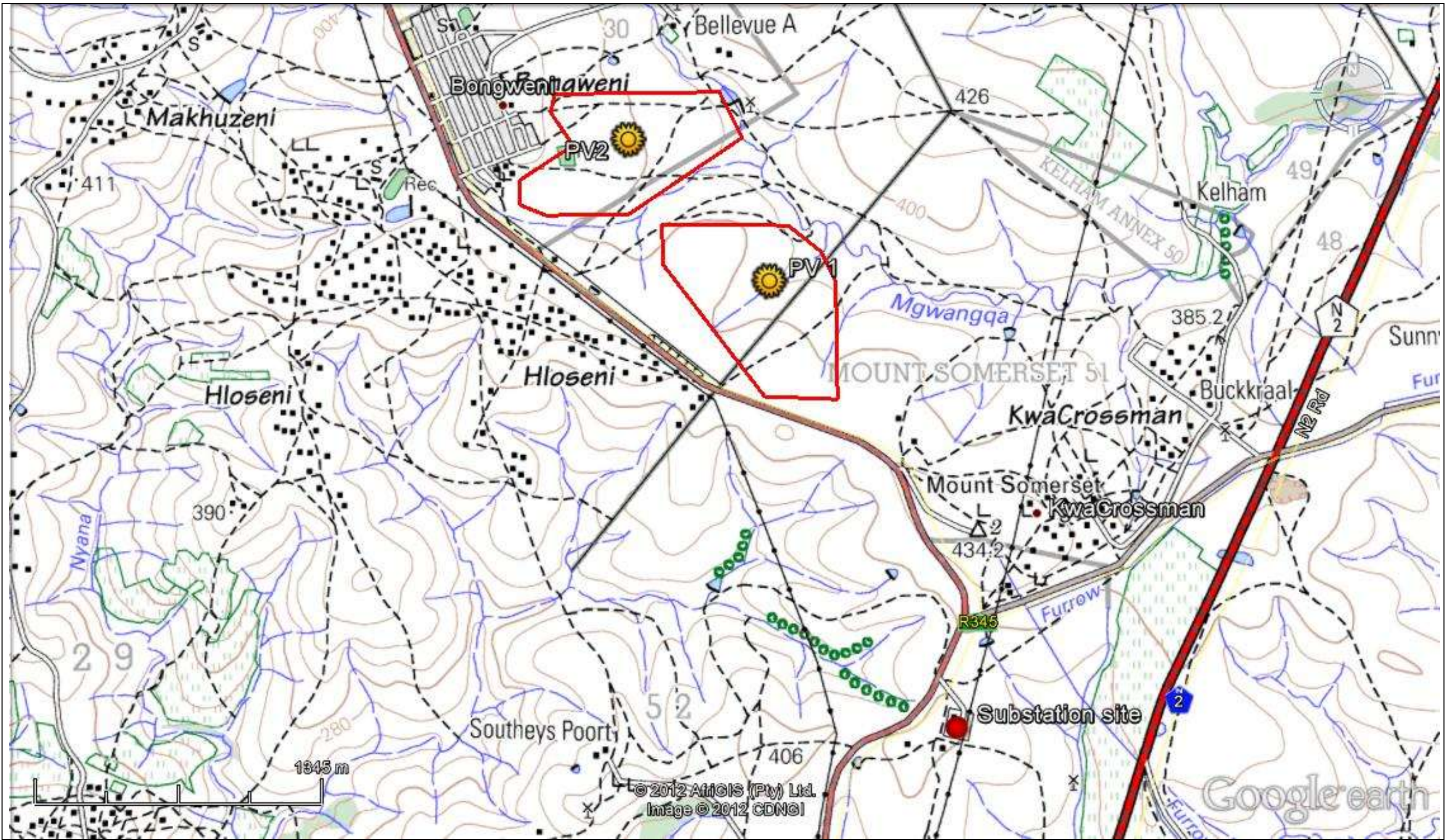


Figure A-2: Cut-out from 1:50 000 map of Peddie.

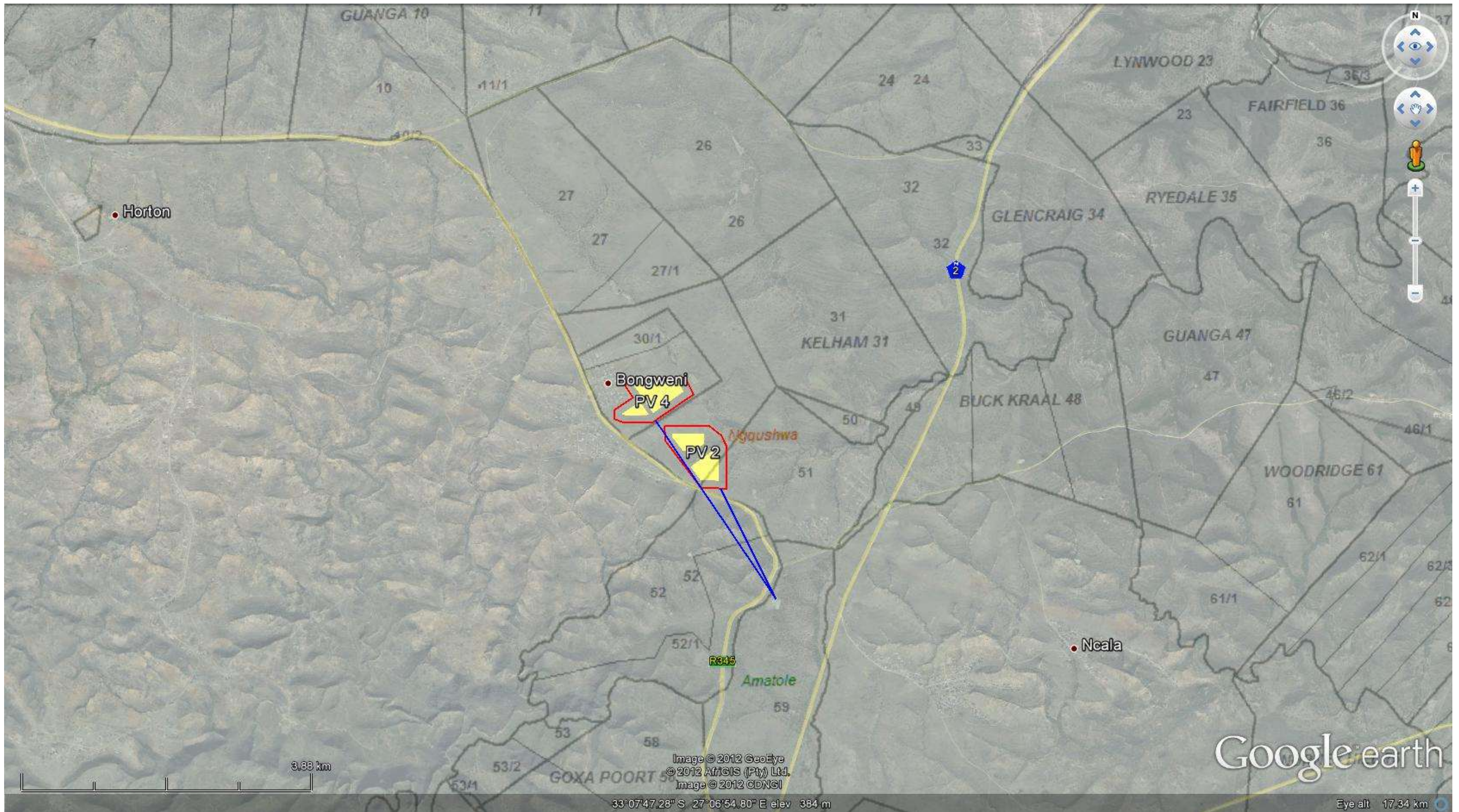


Figure A-3: Surveyed boundaries of the farm portions on which the PV Facility is proposed. These farms are all property of the state (former Ciskei communal land).

## APPENDIX B

### Photographs





## **APPENDIX C**

### **FACILITY ILLUSTRATIONS**

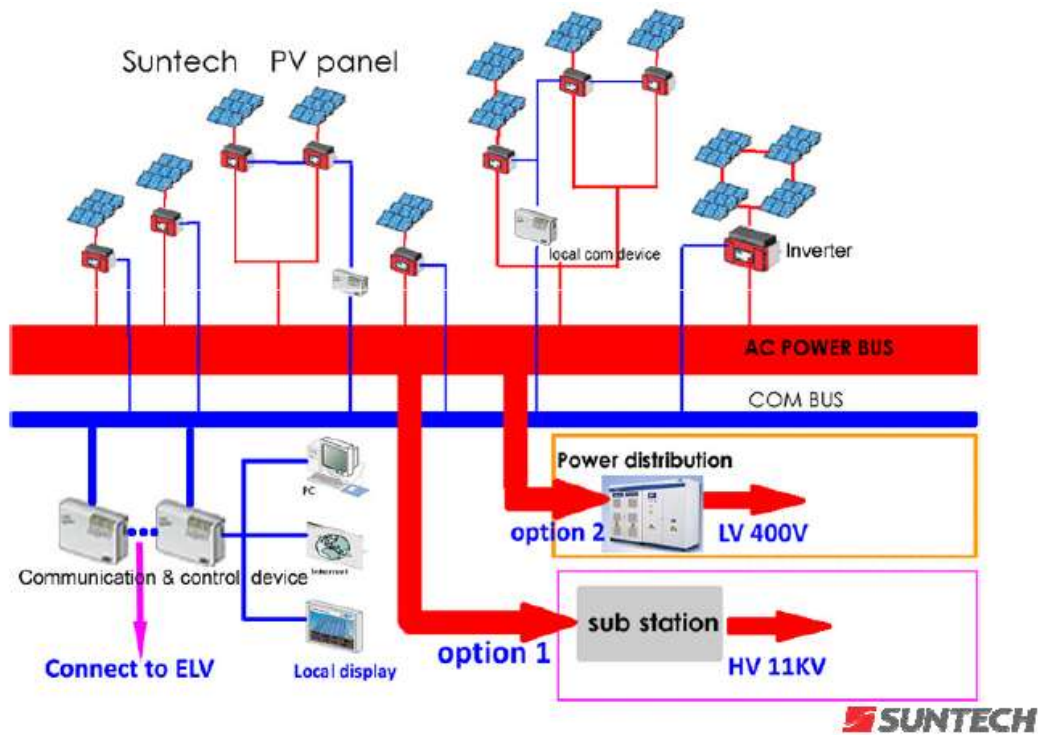


Figure C-1: Diagram of the system concept for the proposed development

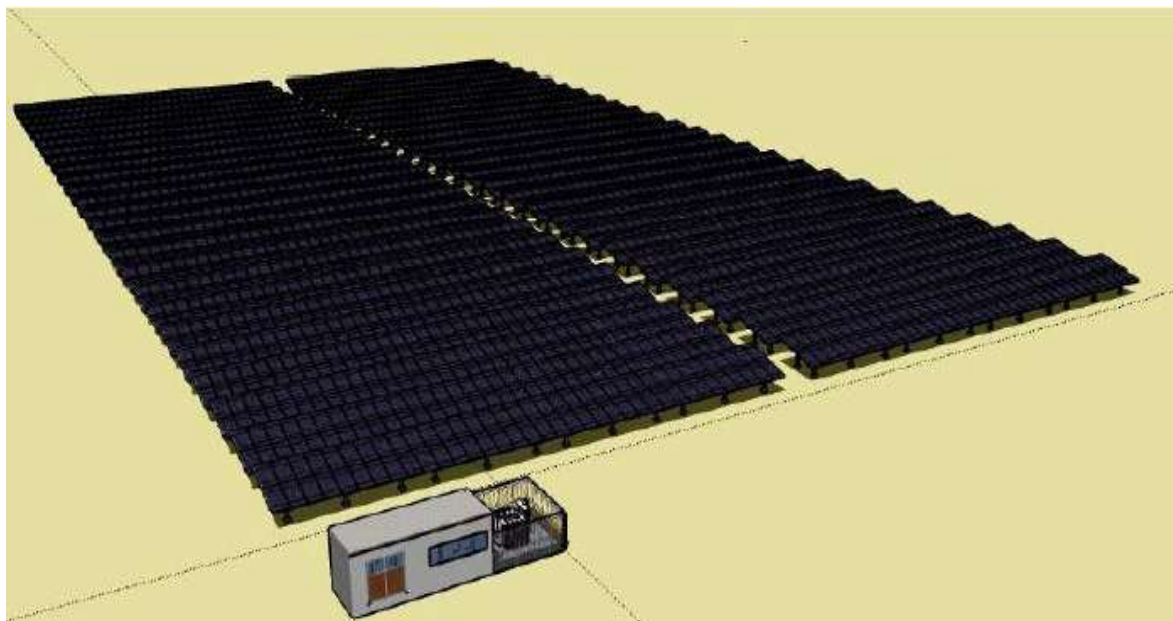


Figure C-3: A photovoltaic showing typical layout of the structures (Source: Suntech Power Holdings Co. Ltd.)



**Figure C-4: An example of the “look” of the proposed PV arrays.**



## **APPENDIX D**

### **Specialist Reports**

**Heritage Impact Assessment (Appendix D-1)**

**Ecological Assessment (Appendix D-2)**

**Visual Impact Assessment (Appendix D-3)**

# **APPENDIX E**

## **Comments and Responses Report**

The following table provides a summary of the comments and responses received for the various registered Interested and Affected Parties:

## **APPENDIX F**

### Environmental Management Programme

## **APPENDIX G**

Other Information  
Public Participation Documentation  
Complete I&AP Database

Daily Dispatch, Friday, October 28, 2011



**Proposed development of a 19mW Photovoltaic (PV) Solar Energy Facility  
(Ngqushwa Local Municipality, Amatole District Municipality, Eastern Cape)**

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT AND INVITATION TO REGISTER AS AN I&AP**

Notice is hereby given in terms of Regulation 54(2) published in Government Notice No. R543 under Chapter 5 of the National Environmental Management Act (Act 107 of 1998) (NEMA), of the intent to submit an Environmental Impact Assessment (EIA) application to the National Department of Environmental Affairs (DEA).

**Proponent and Location:**

InnoWind South Africa is proposing to construct a Photovoltaic (PV) solar energy facility approximately 12km north of Peddie, just east of the R345, Ngqushwa Local Municipality, in the Eastern Cape Province of South Africa.

**Project Activities:**

The proposed project will entail the construction and operation of a Photovoltaic (PV) solar energy facility on 19ha of land located near Peddie. The project will have a potential electrical energy generating output of approximately 19mW.

**Listed Activities:**

The proposed project requires a BASIC ASSESSMENT due to the following activities listed in terms of GN R 544:

- Activity 1 (i): The construction of facilities or infrastructure for the generation of electricity where the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.

**Other possible EIA triggers include:**

- GN R 544: 10(i) and 23(i), GN R 546: 14(a)

Coastal & Environmental Services has been commissioned by InnoWind South Africa to undertake the Environmental Impact Assessment. You are hereby invited to register as an Interested & Affected Party (I&AP). Please submit your name, contact information and any comments to the contact person below within 30 days of this notice.

For more information, registration as an I&AP or submission of written comments contact by post, phone, fax or e-mail:

Contact details: Dr Cherie-Lynn Mack, PO Box 8145, East London, 5210, Tel: 043 742 3302, Fax: 043 742 3306, e-mail: [c.mack@cesnet.co.za](mailto:c.mack@cesnet.co.za)

**Uphuhliso olucetywayo lombane welanga oluyakuba nomthamo oyi-19mW  
(Kumasipala wase Ngqushwa, ophantsi komasipala ombaxa wase Amatole eMpuma Koloni)**

**ISAZISO SOHLOLO SOKUCHAPHAZELEKA  
KOKUSINGQONGILEYO NESIMEMO SOKUBHALISA  
NJENGMNTU ONOMDLA NOCHAPHAZELEKAYO**

Esi saziselo sikhutshwa malunga noMthetho wama-54(2) opapashwe kwiSaziso GNR 543 sikaRhulumente phantsi kweSahluko 5 soMthetho Wokulawula Okusingqongileyo (Umthetho 107 ka 1998) nganjongo yokufaka isicelo Sokuhlola Ukuchaphazeleka Kokusingqongileyo kwisebe lokuSinqongileyo likaZweleke.

**Abanini phuhliso nendawo oluya kwakhiwa kuyo:**

Abakwa InnoWind baceba ukwakhiwa iziko eliphelela umbane welanga malunga neekhilomitha eziyi-12 kwi-Ntshona yase Ngqushwa eMpuma Koloni eMzantsi Afrika.

**Uphuhliso lubandakanya:**

Oluphuhliso lubandakanya ukwakhiwa nokusetyenziswa kwendawo eliphelela umbane welanga kumhlaba oziyi-19 okufutshane neNgqushwa. Olu phuhliso luyakuveza umbane onomthamo oyi 19mW uphelele.

**Umthetho:**

Oluphuhliso lukuluhlulwe izinto ezifuna ukuphandwa ngokwesaziso GN R 544, (1) (i) luthi "Ukwakhiwa kwendawo okanye izinto eziveza umbane oyi 10 MW okanye ngaphantsi kodwa umhlaba oyakusetyenziswa ubengaphazulu kwe-akile enye."

**Ezinye izinto ezinokuchaphazelwa zazi:**

- GN R 544: 10(i) and 23(i), GN R 546: 14(a)

I-Coastal & Environmental Services igunyaziswa ngabakwa InnoWind ukuba yenze uhlolo lokuchaphazeleka kokusingqongileyo lokuphuhliso. Uyamenywa ukuba ubhalise njengomntu onomdla nochaphazelekayo. Nceda faka igama lakho inkcukacha esinokuchaphazelwa ngayo nawe kunye nezimvo zakho kulo mntu ubhalwe ngezantsi phambi kwentsuku ezingamashumi amathathu emva komhla wesaziso.

Inkcukacha zendlela yokuchaphazelwa no: Ms Cherie-Lynn Mack, PO Box 8145, East London, 5210 Tel: 043 742 3302, Fax: 043 742 3306, Email: [c.mack@cesnet.co.za](mailto:c.mack@cesnet.co.za)

Figure G-1: Scanned copy of the advertisement that appeared in the Daily Dispatch on 28 October 2011.



Figure G-2: Photograph of the site notice erected at the site indicated in Figure C-7 on 10 November 2011.

**Initial notification letter and Background Information Document (BID) sent to Stakeholders and I&APs.**

**COASTAL & ENVIRONMENTAL SERVICES**  
Environmental Management and Impact Assessment



67 African Street P.O. Box 934  
Grahamstown 6140 SOUTH AFRICA  
Tel: 046-822 2364 Fax: 046-822 6564  
International: +27-46-822 2364  
Email: info@cesnet.co.za  
Website: www.cesnet.co.za

2 Marine Terrace P.O. Box 8145  
East London 5210 SOUTH AFRICA  
Tel: 043-722 5812 Fax: 043-742 3306  
International: +27-43-722 5812  
Email: cesel@cesnet.co.za  
Website: www.cesnet.co.za

22 November 2011

Dear Stakeholder

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT:**

**BASIC ASSESSMENT FOR THE PROPOSED PEDDIE SOLAR ENERGY FACILITY**

Notice is hereby given in terms of Section 54 (2) (b) and Section 57 of the regulations published in Government Notice No. R. 543 of 18 June 2010 published in terms of Section 24(5) of Chapter 5 read with Section 44 of Chapter 9 of The National Environmental Management Act, (Act no 107 of 1998) as amended, of the intent to carry out a Basic Assessment process and invite all interested and affected parties to register on the project database.

**Project description:** InnoWind South Africa proposes to construct a 19 MW Photovoltaic (PV) solar energy facility on land located near Peddie in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of a 15 - 20 ha Photovoltaic (PV) solar energy facility on property owned by Ngqushwa Local Municipality.

**Public Participation:** A critical element of the Environmental Impact Assessment is the Public Participation. The objective is to contact, notify and inform members of the community who may be interested and/or affected by the proposed Solar Energy Facility, in order that any such party may fully participate, interact and inform the EIA process.

**Listed Activities:**

The proposed project requires a BASIC ASSESSMENT due to the following activities listed in terms of GN R 544:

Government Notice Number	Activity No(s)	Description of listed activity
GN R. No 544 (BA)	1(ii)	The construction of facilities or infrastructure for the generation of electricity where:  (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.
GN R. No 544 (BA)	10 (i)	The construction of facilities or infrastructure for the transmission and distribution of electricity:  (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.
GN R. No. 544 (BA)	23(i)	The transformation of undeveloped, vacant or derelict land to:  (ii) Industrial use, outside an urban area, and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.

Henque 1018 U/a Coastal & Environmental Services Reg no. CK 1997/061914/23 Vat No. 4380172835

Members: ▪ Dr AM Avis (BSe (Hons), PhD) ▪ Prof RA Lubke (BSe (Hons), MSc, PhD)

▪ Dr P Scherman (BSe (Hons), PhD) ▪ Mrs CE Avis (BCom, BA (Hons), MA, CAIB)

▪ Dr AR Carter (BSe (Hons), PhD, BCom, BCompt (Hons), CPA (USA))



GN R. No. 546 (BA)	14(a)(i)	The clearance of an area of 5 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation:  (a) in Eastern Cape:  (i) All areas outside urban areas.
--------------------	----------	--

**Coastal & Environmental Services** has been commissioned by InnoWind South Africa to undertake the Environmental Impact Assessment. You are hereby invited to register as an Interested & Affected Party (I&AP). Please submit your name, contact information and any comments to the contact person below at your earliest convenience to ensure that your comments are captured.

**Consultant:** For more information, registration as an Interested and Affected Party (I&AP), or submission of written comments, please contact by phone, fax, post or email the person below;

Coastal & Environmental Services  
Attn: Dr Greer Hawley or Dr Cherie-Lynn Mack  
PO Box 8145  
East London  
Tel: 043 742 3302  
Fax: 043 742 3306  
E-mail: [g.hawley@cesnet.co.za](mailto:g.hawley@cesnet.co.za) or [c.mack@cesnet.co.za](mailto:c.mack@cesnet.co.za)

We would like to emphasise that should you consider yourself as an I&AP, we request that you register by simply contacting our office at the details given above. This will ensure that all correspondence and progress with regards to the Environmental Impact Assessment are made available to you in a fast and transparent manner.

We look forward to hearing from you.

Kind regards



Cherie-Lynn Mack (PhD)  
Senior Environmental Consultant  
Coastal & Environmental Services

# BACKGROUND INFORMATION DOCUMENT & INVITATION TO COMMENT:

## Peddie Energy 19 MW Photovoltaic Facility, Eastern Cape

### AIM OF THIS DOCUMENT

The aim of this Background Information Document is to provide people affected by and interested in the proposed project with information about this project, the process being followed and to provide them with an opportunity to be involved in the EIA process.

Interested and Affected Parties (IAPs) may raise issues of concern. These will be examined and included in the Reports.

The findings of the EIA will be provided to the DEA (National, Pretoria) for final decision making, as to whether or not the project should go ahead and if so under what conditions.

Return address for comments:

Dr Cherie-Lynn Mack  
1 Hampton Court  
2 Marine Terrace  
P.O Box 8145  
Nahoon, 5210  
Tel: (043) 742 3302  
Fax: (043) 742 3306  
Email:  
[c.mack@cesnel.co.za](mailto:c.mack@cesnel.co.za)

Submit comments by:  
15 January 2012

Your involvement in this process is critical, and will help ensure that all relevant issues are raised and assessed in the EIA process



Figure 1: Illustration of photovoltaic arrays on a solar power plant.

### BACKGROUND

InnoWind South Africa (InnoWind) plans to develop a PV facility on 15-20 hectares of land situated near Peddie, between King Williams Town and Grahamstown. The proposed InnoWind Solar Energy facility will generate an estimated 19 MW of electricity. The proposed development falls under the jurisdiction of Ngqushwa Local Municipality in the Eastern Cape.

Coastal and Environmental Services (CES) has been appointed by InnoWind as the independent consultants to undertake the necessary environmental investigations for the PV facility, and to apply for the required authorisation from the Department of Environmental Affairs (DEA). This is in fulfilment of the requirements of South Africa's environmental legislation, details of which, together with an overview of the environmental impact assessment process, are provided in this document.

### PROJECT DESCRIPTION

Notice is hereby given in terms of Regulation 54(2) published in Government Notice No. R543 under Chapter 5 of the National Environmental Management Act (Act 107 of 1998), of the intent to submit an application for an Environmental Impact Assessment.

The proposed project has a development footprint of 15-20 ha (see Table 1). Please refer to Figure 2 for a location map of the proposed development.

#### RELEVANT LEGISLATION

The National Environmental Management Act (NEMA)(Act No 107 of 1998) identifies activities in terms of section 24(2)(a) and (d) which may not commence without an authorisation from the competent authority, who in this case is Department of Environmental Affairs, (DEA- National). In order to apply for authorisation for the development, assessment and communication of potential impacts of the activities must follow the procedure as described in regulations 26 to 35 of Government Notice No. R 544 of the Environmental Impact Assessment Regulations (2010), promulgated in terms of section 24(5) of NEMA as amended.

The proposed project is subject to a Basic Environmental Impact Assessment in terms of the activities listed in Table 1.

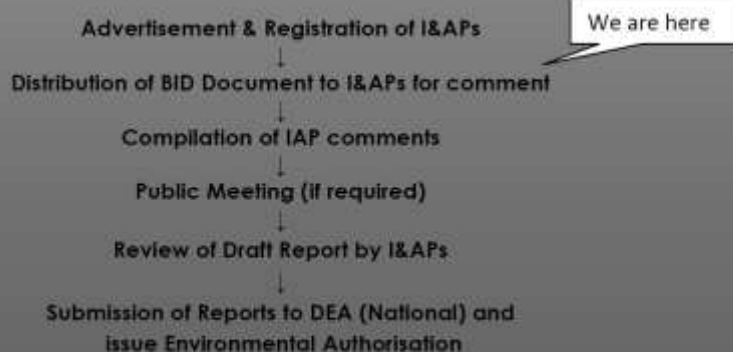
Table 1: Listed activities triggered by the proposed development

Activity No (s)	Listed activity
GN R544 1(ii)	The construction of facilities for the generation of electricity where the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare
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.
23 (ii)	The transformation of undeveloped, vacant or derelict land to residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.
GN R546 14 (a)i	The clearance of an area of 5 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation in all areas outside urban areas.

#### APPROACH TO THIS BASIC ASSESSMENT

This phase serves primarily to inform the public and relevant authorities about the proposed project and to determine any impacts. The potential impact on the surrounding will be extensively addressed by specialists and a Basic Assessment Report, along with the Specialist Reports, will then be submitted and a decision will be made by relevant authorities.

##### Basic Assessment Process



## HOW CAN YOU BE INVOLVED

A Public participation Process (PPP) is being conducted as part of the BA. The aim of the PPP is to allow everyone who is interested in, or likely to be affected by the proposed development to provide input into the process.

The Public Participation Process will include:

- Advertisement in the Daily Despatch
- Notice Boards on site
- Circulation of the BID to all I&APs
- An open day/focus group meeting/public meeting
- Review of the report by all registered I&APs

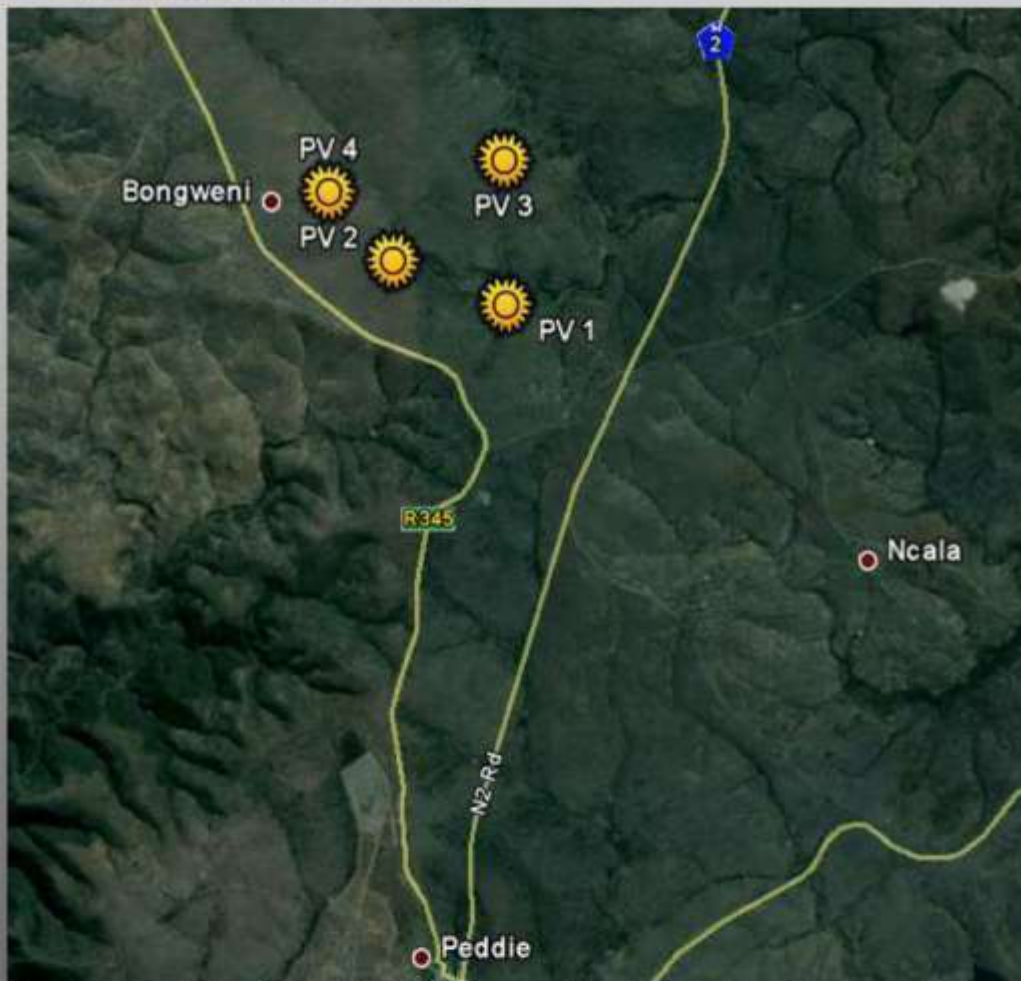


Figure 2: Map showing the location of the proposed development alternatives in relation to Peddie.

**Email notification sent to stakeholders:**

**DWA, SAHRA, Ngqushwa Local Municipality, Amatole District Municipality, Eskom, DEDEAT: Amathole Region**

**Cherie-Lynn Mack**

---

**From:** Nikita Steele <n.steele@cesnet.co.za>  
**Sent:** 22 November 2011 09:05 AM  
**To:** 'nomhles@ngqushwamun.co.za'; 'namhla@ngqushwamun.co.za';  
'khanyisow@amatole-dm.co.za'; 'Xolani.Wana@eskom.co.za'; 'jackL@dwa.gov.za';  
'MalgasM@dwa.gov.za'; 'mgalimberti@sahra.org.za';  
'briant.noncembu@deaet.ecape.gov.za'  
**Cc:** 'ZandiH@ngqushwamun.co.za'; 'MbuyephiN@ngqushwamun.co.za'  
**Subject:** InnoWind Peddie Solar Energy Facility  
**Attachments:** Letter of Notification.pdf; Peddie PV BID.pdf

Dear Stakeholder

Please find attached, a Letter of Notification and Background Information Document for the Environmental Impact Assessment for the proposed InnoWind Peddie Solar Energy Facility in the Eastern Cape.

Kind Regards

**Nikita Steele**  
Environmental Consultant



**Coastal & Environmental Services**  
1 Hampton Court, 2 Marine Terrace, East London 5210  
PO Box 8145 East London 5210  
Tel: 043 742 3302  
Fax: 043 742 3306  
Website: [www.cesnet.co.za](http://www.cesnet.co.za)

## Cherie-Lynn Mack

---

**From:** Nikita Steele <n.steele@cesnet.co.za>  
**Sent:** 22 May 2012 03:10 PM  
**To:** c.mack@cesnet.co.za  
**Subject:** FW: InnoWind Peddie Solar Energy Facility

---

**From:** Jack Landile (ELS) [<mailto:JackL@dwa.gov.za>]  
**Sent:** 22 November 2011 09:28 AM  
**To:** Nikita Steele  
**Cc:** Sigabi Mlungisi; [allancarter@iafrica.com](mailto:allancarter@iafrica.com)  
**Subject:** RE: InnoWind Peddie Solar Energy Facility

Hi Nikita

The proposed location of the above activity refers.

Perhaps, would be able to replace Fig 2 instead send me same a section on 1:50 000 topographic map.

I need to refer to it in terms of perennial water/rivers/streams; marsh/vlei; cultivated lands; infrastructure; cemetery; tri bacons; power lines; and any feature.

It will assist.

Thank you  
Landile

---

**From:** Nikita Steele [<mailto:n.steele@cesnet.co.za>]  
**Sent:** Tuesday, November 22, 2011 9:05 AM  
**To:** [nomhles@ngqushwamun.co.za](mailto:nomhles@ngqushwamun.co.za); [namhla@ngqushwamun.co.za](mailto:namhla@ngqushwamun.co.za); [khanyisow@amatole-dm.co.za](mailto:khanyisow@amatole-dm.co.za); [Xolani.Wana@eskom.co.za](mailto:Xolani.Wana@eskom.co.za); Jack Landile (ELS); [MalgasM@dwa.gov.za](mailto:MalgasM@dwa.gov.za); [mgalimberti@sahra.org.za](mailto:mgalimberti@sahra.org.za); [briant.noncembu@deaet.ecape.gov.za](mailto:briant.noncembu@deaet.ecape.gov.za)  
**Cc:** [Zandih@ngqushwamun.co.za](mailto:Zandih@ngqushwamun.co.za); [MbuyephiN@ngqushwamun.co.za](mailto:MbuyephiN@ngqushwamun.co.za)  
**Subject:** InnoWind Peddie Solar Energy Facility

Dear Stakeholder

Please find attached, a Letter of Notification and Background Information Document for the Environmental Impact Assessment for the proposed InnoWind Peddie Solar Energy Facility in the Eastern Cape.

Kind Regards


**Nikita Steele**  
Environmental Consultant



**Coastal & Environmental Services**

1 Hampton Court, 2 Marine Terrace, East London 5210  
PO Box 8145 East London 5210  
Tel: 043 742 3302  
Fax: 043 742 3306  
Website: [www.cesnet.co.za](http://www.cesnet.co.za)

## Community Meetings

 <p><b>Coastal &amp; Environmental Services</b>  <b>Grahamstown</b>  P. O. Box 934, Grahamstown, 6140  Tel: +27 (46) 622 2364;  Fax: +27 (46) 622 6564  Email: info@cesnet.co.za  <i>Also in East London and Durban</i>  www.cesnet.co.za</p>	MEETING MINUTES	
	<b>CLIENT</b>	InnoWind Peddie Wind and Solar Projects
	<b>DATE</b>	15-11-2011
	<b>VENUE</b>	Bodweni A Village
	<b>TIME OF MEETING</b>	10: 00
	<b>MINUTES BY</b>	Lungisa Bosman
	<b>CIRCULATION DATE</b>	

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
See attendance register		
Lungisa Bosman	<b>CES</b>	
Nkosoms Ndongeni	<b>InnoWind</b>	
<b>APOLOGIES</b>		
Mr Ndongeni said he would be late at the meeting.		

TEXT	ACTION/RESPONSE
As normal the meeting was opened by a prayer.	
CES made a presentation on the EIA process and outlined the purpose of the EIA. The presentation also included project description, EIA process to be followed and informed the community on how to communicate with CES. Mr Bosman from CES mentioned that a number of specialist studies will be done during the EIR phase. These include but not limited to: <ul style="list-style-type: none"> <li>• Heritage Specialists</li> <li>• Ecological Specialists</li> <li>• Avifauna Specialists</li> </ul>	
Mr Bosman mentioned that the proposed activity include two separate projects one for the wind energy and another for solar (PV) facility. There will be employment opportunities created during the construction of both activities but there will be few opportunities during the operational phase of the activities.	
<b>Issues raised</b>	<b>Response</b>
My own view is that we have already accepted the proposed development so let the development happen.	Noted
It is the first time we hear about this solar facility but we do not have a problem with it as long it will be fenced and will not result in safety hazards to people and livestock.	Mr Ndongeni from InnoWind will provide more detail on this aspect.
While we do not know about the solar you are talking what we want is jobs so if it is going to bring job and is safe we also accept it.	Noted. Thank you
When Mr Ndongeni was here he mentioned that there is	That is something that will need to be

<p>going to be rent paid to the community for the turbines (I do not know about the solar so I will not ask about the solar) My question is: will the rent for the turbines stay the same price for all the years that the wind farm will be operating?</p>	<p>discussed between the community and InnoWind.</p>
<p>How many jobs will be created during the while process.</p>	<p>That is something that will need to be discussed between the community and InnoWind.</p>
<p>As you and Mr Ndongeni have mentioned in your presentations that there will be underground cables connecting the facility with the substation my concern is that companies tend to hire machinery while we are looking for job opportunities. My suggestion is that the whole trench for connecting the facility to the substation must be dug by people so that more jobs will be created. We really do not want machines here as they take away our jobs.</p>	<p>Noted. We can make that recommendation in our EIA documentation, but the details will need to be finalised between the community and InnoWind and the contractor.</p>
<p>For us it is the first time we hear about the solar facility my question is when were you (Innowind) going to tell us about this solar facility if CES did not come?</p>	<p>Noted. CES will remind InnoWind that they need to discuss this further with the communities involved.</p>



## I&AP Database

Organisation	Name	E-mail	Postal Address	Tel/ Cell	Fax / Cell
<b>Stakeholders</b>					
Ngqushwa Municipal Manager	Ms Yvonne Nomhle Zongo	<a href="mailto:nomhles@ngqushwamun.co.za">nomhles@ngqushwamun.co.za</a>	PO Box 539, PEDDIE, 5640	(040) 673 3095 086 556 5779	(040) 673 3771
MM Secretary	Ms Z. Hobana	<a href="mailto:ZandiH@ngqushwamun.co.za">ZandiH@ngqushwamun.co.za</a>			
NLM Community Dept Manager	Mr N. Mjo	<a href="mailto:namhla@ngqushwamun.co.za">namhla@ngqushwamun.co.za</a>	PO Box 539, PEDDIE, 5640	040 6733 095	040 6733771
NLM Comm Dept Secretary	Ms Nolonwabo Mbuyephi	<a href="mailto:MbuyephiN@ngqushwamun.co.za">MbuyephiN@ngqushwamun.co.za</a>	PO Box 539, PEDDIE, 5640		
Community Services: Environment & Waste	Mr R Mkontwana		PO Box 539, PEDDIE, 5640	040 673 3095	040 673 3771
ADM Municipal Manager	Mr Khanyiso Wonci	<a href="mailto:khanyisow@amatole-dm.co.za">khanyisow@amatole-dm.co.za</a>	PO Box 320 East London 5200		
Eskom	Xolani Wana	<a href="mailto:Xolani.Wana@eskom.co.za">Xolani.Wana@eskom.co.za</a>			
DWA	Landile Jack	<a href="mailto:jackL@dwa.gov.za">jackL@dwa.gov.za</a>			
DAFF	Dan Malgas	<a href="mailto:MalgasM@dwa.gov.za">MalgasM@dwa.gov.za</a>			
South African Heritage Resources Agency	Mariagrazia Galimberti	<a href="mailto:mgalimberti@sahra.org.za">mgalimberti@sahra.org.za</a>			
Ward Councillor (Ward 8)	A Mtshakazi			073 0708700	
DEDEA	Briant Noncembu	<a href="mailto:briant.noncembu@deaet.ecape.gov.za">briant.noncembu@deaet.ecape.gov.za</a>			

# APPENDIX H

## Methodology for assessing the significance of impacts

To ensure a direct comparison between various issues identified, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Five factors need to be considered when assessing the significance of impacts, namely:

1. Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
2. Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.
3. The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.

The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.

4. The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of "**VERY HIGH**" and "**HIGH**" significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers i.e. lots of **HIGH** negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of "**MODERATE**" significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as "**LOW**" significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

**Table 9-1: Criterion used to rate the significance of an impact**

<b>Significance Rating Table</b>	
<b>Temporal Scale (The duration of the impact)</b>	
<u>Short term</u>	Less than 5 years (Many construction phase impacts are of a short duration).
<u>Medium term</u>	Between 5 and 20 years.
<u>Long term</u>	Between 20 and 40 years (From a human perspective almost permanent).
<u>Permanent</u>	Over 40 years or resulting in a permanent and lasting change that will always be there.
<b>Spatial Scale (The area in which any impact will have an affect)</b>	
<b>Individual</b>	Impacts affect an individual.
<b>Localised</b>	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
<b>Project Level</b>	Impacts affect the entire project area.
<b>Surrounding Areas</b>	Impacts that affect the area surrounding the development
<b>Municipal</b>	Impacts affect either the Local Municipality, or any towns within them.
<b>Regional</b>	Impacts affect the wider district municipality or the province as a whole.
<b>National</b>	Impacts affect the entire country.
<b>International/Global</b>	Impacts affect other countries or have a global influence.
<b>Will definitely occur</b>	Impacts will definitely occur.
<b>Degree of Confidence or Certainty (The confidence with which one has predicted the significance of an impact)</b>	
<i>Definite</i>	More than 90% sure of a particular fact. Should have substantial supportive data.
<i>Probable</i>	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
<i>Possible</i>	Only over 40% sure of a particular fact or of the likelihood of an impact occurring.
<i>Unsure</i>	Less than 40% sure of a particular fact or of the likelihood of an impact occurring.

**Table 9-2: The severity rating scale**

Impact severity (The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)	
Very severe	Very beneficial
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	Beneficial
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	Moderately beneficial
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	Slightly beneficial
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Overall Significance (The combination of all the above criteria as an overall significance)	
VERY HIGH NEGATIVE	VERY BENEFICIAL
<p>These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in <b>severe</b> or <b>very severe</b> effects, or <b>beneficial</b> or <b>very beneficial</b> effects.</p> <p><b>Example:</b> The loss of a species would be viewed by informed society as being of VERY HIGH significance.</p> <p><b>Example:</b> The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.</p>	
HIGH NEGATIVE	BENEFICIAL
<p>These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.</p> <p><b>Example:</b> The loss of a diverse vegetation type, which is fairly common elsewhere, would</p>	

have a significance rating of HIGH over the long term, as the area could be rehabilitated.  
**Example:** The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.

**MODERATE NEGATIVE**

**SOME BENEFITS**

These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.

**Example:** The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.

**LOW NEGATIVE**

**FEW BENEFITS**

These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.

**Example:** The temporary change in the water table of a wetland habitat, as these systems is adapted to fluctuating water levels.

**Example:** The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.

**NO SIGNIFICANCE**

There are no primary or secondary effects at all that are important to scientists or the public.

**Example:** A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.

**DON'T KNOW**

In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.

**Example:** The effect of a particular development on people's psychological perspective of the environment.

## Case studies on solar PV reflectivity

### 5.0 Visual Impact (contd.)

#### 5.5 Reflectivity

There is a perceived issue of glint and glare surrounding the reflectivity of the proposed PV solar panels. As a result of the perceived reflection levels, there is a concern of possible distractions to motorists, aircraft and the hazard of eye damage.

The Poly-Crystalline Solar Panels proposed for the installation (see figure 12) are designed to absorb the sun's energy and directly convert it to electricity. The PV modules being used in the installation for the Nyngan Solar Farm absorb approximately 82-90% of the light received. The SunTech Solar Panels proposed for the Nyngan Solar Farm have been designed using two anti-reflective coatings which effectively reduces the reflectivity. Innovative methods of developing the required metal contact on the face of the solar panel reduces the metal surface area and further reduces any potential glare.

The Nyngan Airport is located just under 3km north of the Site and a number of landing grounds are located within close proximity to the area. PV Solar Panels have been installed at a number of airports in the USA, including Denver and the Oakland FedEx International Airport Hub. These precedents and further studies have found that the reflection created would not cause problems for aircraft, particularly at the critical take off and landing stages.

The level of glare and reflectance from the PV solar panels are considerably lower than the level of glare and reflectance of in common suburbs and those surrounding the proposed Solar Farm. The PV panels would reflect approximately 10-18% of energy which is less than typical rural environments which have a reflectivity of approximately 15-30%. Figure 11 compares the percentage of reflected energy from common reflective surfaces to that of a PV Solar Panel.

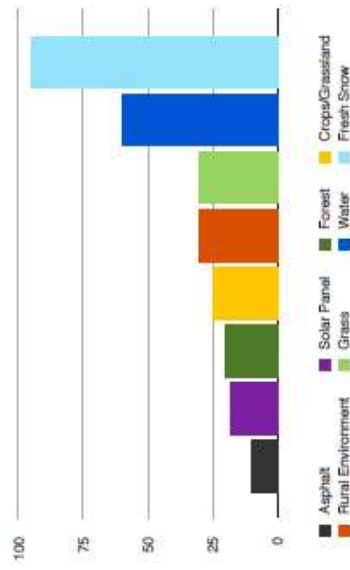


Figure 11: Comparative reflection analysis.



Denver International Airport Solar Farm  
<http://www.denverairport.com>



Nellis Air Force Base  
<http://www.afscfbases.com.au>



Figure 12: SunTech VO 280 PV Solar Panel  
<http://www.suntech-power.com>

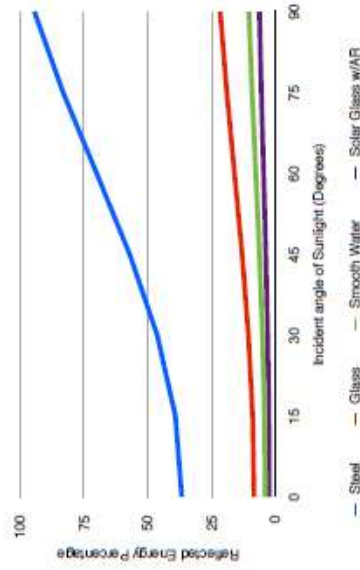


Figure 13: Analysis of typical material reflectivity.

## 6.0 Conclusion

The proposed Nyngan Solar Farm is a renewable energy source which involves the installation of solar panels over approximately 200ha of existing rural landscape.

With all visual impact assessments the objective is not to determine whether the proposed impact is visible or not visible, it is to determine how the proposal will impact on the existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated if and how the impact can be mitigated to the extent that the impact is reduced to an acceptable level.

The characteristics which influence the visual impacts associated with the proposal include:

- the sensitivity of the viewing location;
- the visibility of the development for residence and general public;
- the layout of the solar farm and size of the panels;
- the visual appearance of solar panels and associated ancillary works.

Overall the proposed Nyngan Solar Farm would result in impacts on the existing surrounding environment in terms of landscape and scenic values. The proposed solar farm contrasts with the existing landscape character of the region which is typically rural, agricultural land. The Site is situated upon currently uninhabited, flat, cleared, grazing land.

The Solar Farm is within close proximity to the town of Nyngan, associated residential properties and major transport infrastructure, and therefore it is possible it will be visible from some areas surrounding the Site.

The developed area nearest the Site is located approximately 600m to the north of the proposed solar farm, in the rural residential precinct of Nyngan. These properties are all located to the north of the flood levee which, due to its height and the low height of the solar panels, obscures views to the Solar Farm.

Overall, visibility of the Site will be limited to the cleared grazing land to the east of the Site. This land is typically uninhabited with the exception of an scattered homestead. The homestead is located approximately 360m to the north east of the eastern section of the proposed development. The Site will be visible from this property, however a combination of existing mallee scrub vegetation on and foreground planting surrounding the provides a limited visual buffer between the property and the Site. The employment of additional impact mitigation principles as outlined in section 7 of this report will significantly reduce the visual impact from areas to the east.

Contours of the proposed development will be seen from the Mitchell Highway, traveling in both directions. These views are fleeting and in relation to the speed of travel and distance from the site, will have a minor impact. One impact mitigation strategies have been employed, the visual impact of the proposed development will be significantly reduced.

To assist in quantifying the visual impact of the solar farm, 9 viewpoints were selected from a range of distances and elevations. Of all 9 viewpoints assessed, the solar farm would be visible from only 3 of these positions.

Overall, the proposed solar farm is relatively low lying, with the panels spanning to a height of approximately 2-3m. The panels are north facing on an angle of approximately 30 degrees. Resultantly the biggest visual impact of the solar panels is expected to occur from the north and south. Looking at the panels from a side elevation on the east or west, the visibility would be limited on a level ground.

Proposed methods of mitigation for these areas form section 7 of this report, focusing on the areas with the highest visual impact. These suggested recommendations have the ability to significantly reduce the visual impact of the Nyngan Solar Farm to achieve a better visual integration at both a local and regional scale.

It is undeniable that the proposed development of a Solar Farm on land identified as the 'Study Site' would have an impact on the existing landscape character of the area. However, in our professional opinion, the impact of the proposed Nyngan Solar Farm is considered to be low. The greatest visual impact would be apparent within the immediate vicinity of the solar farm however once landscape mitigation methods have been implemented and the growth of screen planting surrounding the site has matured, the visual impact of the Solar Farm will be negligible.

## Reflectivity of Solar Electric (PV) Modules for the Fresno Airport Solar Power Project

The question of solar module reflectivity and the potential visual impacts arises from time to time when solar electric power projects are near airports or population areas.

Solar modules are designed to absorb solar energy and to convert it to electricity. Most are designed with anti-reflective glass front surfaces ("flat plate PV modules") to capture and retain as much of the solar spectrum as possible. Solar module glass has reflectivity less than water or window glass. The Fresno Airport Solar Project will utilize both flat plate PV modules and PV modules that capture and concentrate sunlight onto a solar cell. In the case of concentrators, all the light that hits the solar modules is focused onto a smaller area within the solar module, and the only reflected light is from heat.

The following pictures show both types of solar modules planned for the project.



Many projects throughout the US and the world have been installed near airports with no impact on flight operations. Information on some projects is provided.



## Solar System Covers Roof

The major portion of the six-month project period was taken up with design and permitting processes. The actual installation took four to six weeks. Garcia says his instructions from FedEx Express were, "Don't bother the operations," and the installation crew did not.



The Hub's 81,000-square-foot roof offered an ideal site for the system.

During the permitting process, the Federal Aviation Administration got involved because it was concerned about the height of the crane that would lift PV panels to the roof, about 30 feet above the building. The FAA asked that a red flag be placed on top of the crane to alert airplane pilots. The FAA also had concerns about potential glare from the panels that might affect aircraft landings. Garcia says the PV panels have anti-reflective coatings to absorb as much light as possible. "This is true for all crystalline panels and is standard for PV panels," he says, adding that the reflectivity of the panels is less than that for water.

Garcia describes the method used for installing the PV panels on the roof of the Express Hub. A solar panel, made up of 60 silicon wafer cells, is mounted on an insulated PowerGuard unit known as a tile. The 5,769 tiles were then arranged on the roof to surround the many air-conditioning units located there. The solar panels encompass virtually the entire 81,000 square feet of roof space across the facility's two buildings.