



DEPARTMENT of  
ENVIRONMENTAL AFFAIRS  
& DEVELOPMENT PLANNING

Provincial Government of the Western Cape

GR RD RENEWABLE ENERGY PROJECT  
DRAFT BASIC ASSESSMENT REPORT:  
DARLING ROAD RENEWABLE  
ENERGY PROJECT  
(AUGUST 2010)

**Basic Assessment Report in terms of the NEMA Environmental Impact Assessment  
Regulations, 2010**

**AUGUST 2010**

**Kindly note that:**

1. This **Basic Assessment Report** is the standard report required by DEA&DP in terms of the EIA Regulations, 2010 and must be completed for all Basic Assessment applications.
2. This report must be used in all instances for Basic Assessment applications for an environmental authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended, and the Environmental Impact Assessment Regulations, 2010, and/or a waste management licence in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM: WA), and/or an atmospheric emission licence in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA).
3. This report is current as of 2 August 2010. It is the responsibility of the Applicant / EAP to ascertain whether subsequent versions of the report have been published or produced by the competent authority.
4. The required information must be typed within the spaces provided in the report. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. It is in the form of a table that will expand as each space is filled with typing.
5. Incomplete reports will be rejected. A rejected report may be amended and resubmitted.
6. The use of "not applicable" in the report must be done with circumspection. Where it is used in respect of material information that is required by the Department for assessing the application, this may result in the rejection of the report as provided for in the regulations.
7. **While the different sections of the report only provide space for provision of information related to one alternative, if more than one feasible and reasonable alternative is considered, the relevant section must be copied and completed for each alternative.**
8. Unless protected by law all information contained in, and attached to this report, will become public information on receipt by the competent authority. If information is not submitted with this report due to such information being protected by law, the applicant and/or EAP must declare such non-disclosure and provide the reasons for the belief that the information is protected.
9. This report must be submitted to the Department at the postal address given below or by delivery thereof to the Registry Office of the Department. No faxed or e-mailed reports will be accepted. **Please note that for waste management licence applications, this report must be submitted for the attention of the Department's Waste Management Directorate (tel: 021-483-2756 and fax: 021-483-4425) at the same postal address as the Cape Town Office Region A.**
10. Unless indicated otherwise, two electronic copies (CD/DVD) and three hard copies of this report must be submitted to the Department.

**DEPARTMENTAL DETAILS**

<b>CAPE TOWN OFFICE REGION A (Cape Winelands, City of Cape Town: Tygerberg and Oostenberg Administrations)</b>	<b>CAPE TOWN OFFICE REGION B (West Coast, Overberg, City of Cape Town: Helderberg, South Peninsula, Cape Town and Blaauwberg Administrations)</b>	<b>GEORGE OFFICE (Eden and Central Karoo)</b>
Department of Environmental Affairs and Development Planning Attention: Directorate: Integrated Environmental Management (Region A2) Private Bag X 9086 Cape Town, 8000  Registry Office 1 <sup>st</sup> Floor Utilitas Building 1 Dorp Street, Cape Town  Queries should be directed to the Directorate: Integrated Environmental Management (Region A2) at: Tel: (021) 483-4793 Fax: (021) 483-3633	Department of Environmental Affairs and Development Planning Attention: Directorate: Integrated Environmental Management (Region B) Private Bag X 9086 Cape Town, 8000  Registry Office 1 <sup>st</sup> Floor Utilitas Building 1 Dorp Street, Cape Town  Queries should be directed to the Directorate: Integrated Environmental Management (Region B) at: Tel: (021) 483-4094 Fax: (021) 483-4372	Department of Environmental Affairs and Development Planning Attention: Directorate: Integrated Environmental Management (Region A1) Private Bag X 6509 George, 6530  Registry Office 4 <sup>th</sup> Floor, York Park Building 93 York Street George  Queries should be directed to the Directorate: Integrated Environmental Management (Region A1) at: Tel: (044) 805 8600 Fax: (044) 874-2423

View the Department's website at <http://www.capegateway.gov.za/eadp> for the latest version of this document.

**DEPARTMENTAL REFERENCE NUMBER(S)**

File reference number (EIA):	
File reference number (Waste):	E13/2/10/1-F5/5-WL0057/11
File reference number (Other):	

**PROJECT TITLE**

The FSC Darling Road Renewable Energy Project

**DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

Environmental Assessment Practitioner (EAP):	WorleyParsons RSA (Pty) Ltd		
Contact person:	Michelle Herbert		
Postal address:	PO Box 398		
	Bellville	Postal code:	7535
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E-mail:	<a href="mailto:michelle.herbert@worleyparsons.com">michelle.herbert@worleyparsons.com</a>	Fax:	086 509 5755
EAP Qualifications	BSc Hons Environmental Science		
EAP Registrations/Associations	IAIAsa Water Institute of South Africa (WISA)		

**Details of the EAP's expertise to carry out Basic Assessment procedures**

Michelle Herbert is an Environmental Scientist with more than 3 years' experience in the field of environmental and waste management in South Africa.

Her experience includes the compilation of basic assessment reports, environmental impact assessment reports, environmental management programmes and environmental method statements for construction activities. She has also compiled various water use license applications and water quality management reports for several wastewater treatment works in the Northern and Western Cape. She also has experience in the identification and notification of interested and affected parties, conducting of focus group and public meetings and other administrative duties associated with the public participation process.

She has been active during the conducting of site assessments and the appointment and management of specialist consultants to conduct studies such as road management plans, archaeological and palaeontological impact assessments, noise impacts assessment and air quality assessments and ecological specialist studies.

As Environmental Control Officer for various construction sites she gained experience in the environmental monitoring of construction activities.

**EXECUTIVE SUMMARY OF THE CONTENT OF THE BASIC ASSESSMENT REPORT:**

Farmsecure Carbon is a company in the Farmsecure Technologies group of businesses, which is majority owned by the Farmsecure Group of Companies. Farmsecure Carbon is a project development and consultancy company for greenhouse gas emission mitigation and renewable energy in the agricultural sector. Their vision is the identification, design, financing, implementation and operation of economically viable projects under the Clean Development Mechanism (CDM) and in the areas of bio-energy and carbon emission reduction. This includes the provision of carbon-related services such as the compilation of carbon footprints, carbon reduction strategies and feasibility studies.

Farmsecure Carbon mainly focus on:

- the implementation of biomass to renewable fuel projects
- carbon credits
- the processing of by-products into fertilizer
- through the above, improve the sustainability and environmental management of the primary agricultural process

The production of renewable energy, carbon credits and fertilizer products from waste sources of agricultural bio-mass, presents an exciting opportunity, in that pre-feasibility studies indicate that:

- The projects would have attractive financial returns.
- They can be based on well-established technology which has already been widely used for many years on other continents.
- They can improve the environmental management and economic sustainability of the primary agricultural enterprise generating the bio-mass. Farmsecure Carbon has assembled a highly experienced and multi-disciplinary team which can identify and implement these projects.

Farmsecure Carbon identified the FSC Darling Road Renewable Energy Project as a Waste-to-Energy project where they will construct infrastructure to capture the manure from the livestock farming activities and transport it to an anaerobic digester. The biomass will then be converted into a biogas through anaerobic digestion. The biogas created in the process is a gaseous mixture comprising mostly of methane and carbon dioxide, but also contains a small amount hydrogen and trace levels of hydrogen sulphide. The methane in the biogas is burned to produce electricity using a gas engine. The heat that is generated is used to heat buildings. The electricity is sold to external third parties through the national grid and when the grid is down it is used on the farm. Electricity produced by anaerobic digesters is considered to be green. The solids from the digester are separated and used as fertilizer. The liquid effluent from the process will be irrigated on the farm.

Oatlands Farm is situated at the end of the R307 (Old Darling Road) 17km from Darling. Oatlands is located 45km from Malmesbury on the R315. The total amount of dairy cattle being milked daily on Oatlands is 1 300. The dairy farm and housing units are situated 187m above sea level and the proposed site for the digester is situated at 177m above sea level. The area is relatively flat with only the Kapokberg 3.4km north of the far.

The volume of waste at Oatlands is consistent at 120 000 litres of slurry each day (16.6% solids) from the 1 300 cows milked. Of the solids 50% (9.96 ton) is separated. The slurry (with 8.3%) is sent to a lagoon system consisting of 6 lagoons where it is treated anaerobically for one to six hours. The solids are spread on the fields. The sizes of

the lagoons are on average 30m long x 10m wide x 2.5m deep. The manure of the dry cows is spread on the fields. There is approximately another 1 000 dry cows and calves.

The project will have a generation capacity of 337kW and the digester will be 2 070m<sup>3</sup>. Irrigation water from the digester will irrigate approximately 1 ha.

## SECTION A: ACTIVITY INFORMATION

### 1. PROJECT DESCRIPTION

(a) Is the project a new development?	YES	NO
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(b) Provide a detailed description of the development project and associated infrastructure.

Farmsecure Carbon will construct infrastructure to capture the manure from the livestock farming activities and transport it to an anaerobic digester. The biomass will then be converted into a biogas through anaerobic digestion. The biogas created in the process is a gaseous mixture comprising mostly of methane and carbon dioxide, but also contains a small amount hydrogen and trace levels of hydrogen sulphide. The methane in the biogas is burned to produce electricity using a gas engine. The heat that is generated is used to heat buildings. The electricity is sold to external third parties through the national grid and when the grid is down it is used on the farm. Electricity produced by anaerobic digesters is considered to be green. The solids from the digester are separated and used as fertilizer. The liquid effluent from the process will be irrigated on the farm.

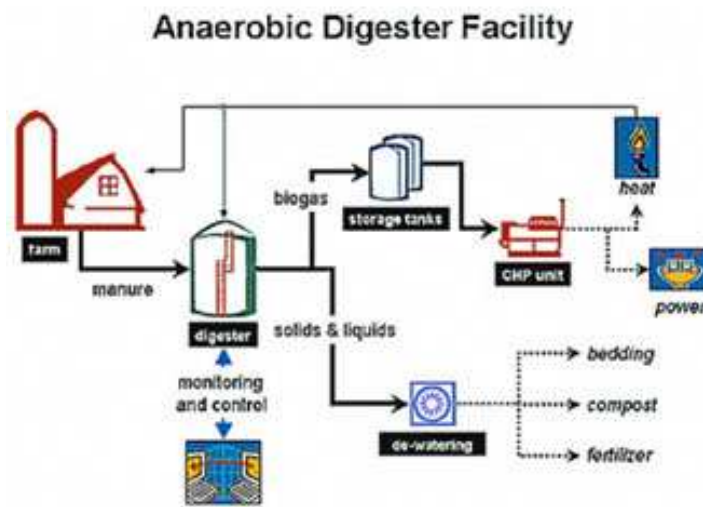


Figure 1 An example of the anaerobic digester facility.

(c) List all the activities assessed during the Basic Assessment process:

GN No. R. 544 Activity No(s):	Describe the relevant <b>Basic Assessment Activity(ies)</b> in writing as per <b>Listing Notice 1</b> (GN No. R. 544)	Describe the portion of the development as per the project description that relates to the applicable listed activity.
	No activities triggered.	
GN No. R. 546 Activity No(s):	Describe the relevant <b>Basic Assessment Activity(ies)</b> in writing as per <b>Listing Notice 3</b> (GN No. R. 546)	Describe the portion of the development as per the project description that relates to the applicable listed activity.
	No activities triggered.	

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**If the application is also for activities as per Listing Notice 2 and permission was granted to subject the application to Basic Assessment, also indicate the applicable Listing Notice 2 activities:**

GN No. R. 545 Activity No(s):	If permission was granted in terms of Regulation 20, describe the relevant <b>Scoping and EIA Activity(ies)</b> in writing as per <b>Listing Notice 2</b> (GN No. R. 545)	Describe the portion of the development as per the project description that relates to the applicable listed activity.
	No activities triggered.	

**Waste management activities** in terms of the NEM: WA (Government Gazette No. 32368):

GN No. 718 - Category A Activity No(s):	Describe the relevant <u>Category A</u> waste management activity in writing.
10	The processing of waste at biogas installations with a capacity to process in excess of 5 tons per day of biodegradable waste
17	The storage, treatment or processing of animal manure at a facility with a capacity to process in excess of one tone per day
18	The construction of facilities for the activities listed in Category A of this Schedule.

**Please note:** If any waste management activities are applicable, the **Listed Waste Management Activities Additional Information Annexure** must be completed and attached to this Basic Assessment Report as **Appendix I**.

If the application is also for waste management activities as per Category B and permission was granted to subject the application to Basic Assessment, also indicate the applicable Category B activities:

GN No. 718 – Category B Activity No(s):	Describe the relevant <u>Category B</u> waste management activity in writing.
	No activities triggered.

**Atmospheric emission activities** in terms of the NEM: AQA (Government Gazette No. 33064):

GN No. 248 Activity No(s):	Describe the relevant atmospheric emission activity in writing.
	No activities triggered.

(d) Please provide details of all components of the proposed project and attach diagrams (e.g. architectural drawings or perspectives, engineering drawings, process flow charts etc.).

Buildings	YES	NO
Provide brief description:		
The following structures will be constructed: <ul style="list-style-type: none"> <li>• Control/Engine/Dewatering room (28m x 10.5m)</li> <li>• Feed Storage Lagoon (3.6m x 3.6m x 3m) – HDPE Lined. Volume = 40 m<sup>3</sup></li> <li>• Concrete Digester (30m x 11m x 5m). Volume = 1 670 m<sup>3</sup></li> <li>• Digestate Storage Lagoon (49m x 34m x 5m) – HDPE Lined. Volume = 4 880 m<sup>3</sup></li> </ul>		

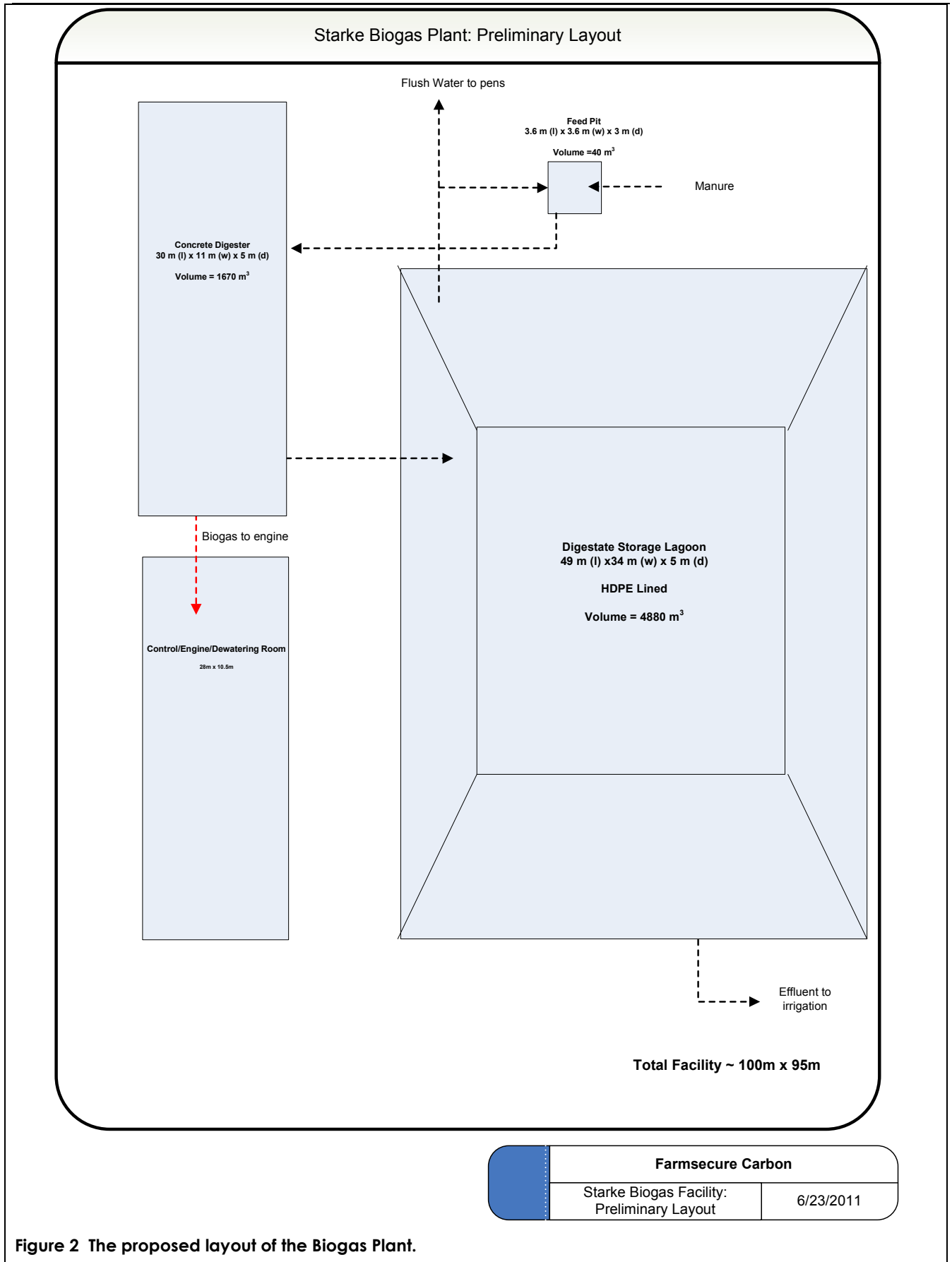


Figure 2 The proposed layout of the Biogas Plant.

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Infrastructure (e.g. roads, power and water supply/ storage)	<b>YES</b>	NO
Provide brief description:		
No road will be constructed. Existing roads will be used.		
No water storage. The proposed activity will require the construction of a digestate lagoon.		
A small transformer and 11kV transmission line will be constructed to feed into the national grid. The methane and other gasses will be abstracted in the digestate storage lagoon, burnt in a gas engine to produce power to feed into the grid.		
Processing activities (e.g. manufacturing, storage, distribution)	<b>YES</b>	NO
Provide brief description:		
Please refer to Figure 2 (above) and the attached anaerobic digestion block flow diagram attached in Appendix B of the draft BAR.		
Storage facilities for raw materials and products (e.g. volume and substances to be stored)		
Provide brief description	<b>YES</b>	NO
With reference to Figure 2 (above) raw manure will be temporary stored in the feed storage lagoon.  Dimensions: 3.6m x 3.6m x 3m. Volume: 40m <sup>3</sup> .		
Storage and treatment facilities for solid waste and effluent generated by the project		
Provide brief description	<b>Yes</b>	No
With reference to Figure 2 (above) the proposed facility is for the treatment of animal manure to biogas and treated effluent utilised for irrigation and fertilisation.  The dimensions of the facility are as follow: <ul style="list-style-type: none"> <li>• Control/Engine/Dewatering room (28m x 10.5m)</li> <li>• Feed Storage Lagoon (3.6m x 3.6m x 3m) – HDPE Lined. Volume = 40 m<sup>3</sup></li> <li>• Concrete Digester (30m x 11m x 5m). Volume = 1 670 m<sup>3</sup></li> <li>• Digestate Storage Lagoon (49m x 34m x 5m) – HDPE Lined. Volume = 4 880 m<sup>3</sup></li> </ul>		
Other activities (e.g. water abstraction activities, crop planting activities)	<b>Yes</b>	No
Provide brief description		
The treated effluent will be separated and solids will be used as fertilizer and the liquid will be irrigated. In the past fertilising with the manure has taken place when needed. The anaerobic digester will eliminate all hazardous organic substance in the manure making it more suitable for soil application.		

### 2. PHYSICAL SIZE OF THE ACTIVITY

	<b>Size of the property:</b>
(a) Indicate the size of the property (cadastral unit) on which the activity is to be undertaken.	11 794 734 m <sup>2</sup>
	<b>Size of the facility:</b>
(b) Indicate the size of the facility (development area) on which the activity is to be undertaken.	9 500 m <sup>2</sup>

	Size of the activity:
(c) Indicate the physical size (footprint) of the activity together with its associated infrastructure:	m <sup>2</sup>
(d) Indicate the physical size (footprint) of the activity:	m <sup>2</sup>
(e) Indicate the physical size (footprint) of the associated infrastructure:	m <sup>2</sup>

and, for linear activities:

	Length of the activity:
(f) Indicate the length of the activity:	N/A m

### 3. SITE ACCESS

(a) Is there an existing access road?	YES	NO
(b) If no, what is the distance over which a new access road will be built?	N/A m	

(c) Describe the type of access road planned:

Existing access roads will be utilised for this project.

**Please Note:** indicate the position of the proposed access road on the site plan.

### 4. DESCRIPTION OF THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND THE LOCATION OF THE ACTIVITY ON THE PROPERTY

(a) Provide a description of the property on which the activity is to be undertaken and the location of the activity on the property.

Oatlands Farm is situated at the end of the R307 (Old Darling Road) 17km from Darling. Oatlands is located 45km from Malmesbury on the R315. The total amount of dairy cattle being milked daily on Oatlands is 1 300. The dairy farm and housing units are situated 187m above sea level and the proposed site for the digester is situated at 177m above sea level. The area is relatively flat with only the Kapokberg 3.4km north of the far.

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(b) Please provide a location map (see below) as **Appendix A** to this report which shows the location of the property and the location of the activity on the property; as well as a site map (see below) as **Appendix B** to this report; and if applicable all alternative properties and locations.

Locality map:	<p>The scale of the locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map. The map must indicate the following:</p> <ul style="list-style-type: none"> <li>• an accurate indication of the project site position as well as the positions of the alternative sites, if any;</li> <li>• road names or numbers of all the major roads as well as the roads that provide access to the site(s)</li> <li>• a north arrow;</li> <li>• a legend;</li> <li>• the prevailing wind direction (during November to April and during May to October); and</li> <li>• GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).</li> </ul>
Site Plan:	<p>Detailed site plan(s) must be prepared for each alternative site or alternative activity. The site plan must contain or conform to the following:</p> <ul style="list-style-type: none"> <li>• The detailed site plan must be at a scale preferably at a scale of 1:500 or at an appropriate scale. The scale must be indicated on the plan.</li> <li>• The property boundaries and numbers of all the properties within 50m of the site must be indicated on the site plan.</li> <li>• The current land use (not zoning) as well as the land use zoning of each of the adjoining properties must be indicated on the site plan.</li> <li>• The position of each element of the application as well as any other structures on the site must be</li> </ul>

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	<p>indicated on the site plan.</p> <ul style="list-style-type: none"> <li>Services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, storm water infrastructure and access roads that will form part of the development must be indicated on the site plan.</li> <li>Servitudes indicating the purpose of the servitude must be indicated on the site plan.</li> <li>Sensitive environmental elements within 100m of the site must be included on the site plan, including (but not limited to): <ul style="list-style-type: none"> <li>Rivers.</li> <li>Flood lines (i.e. 1:10, 1:50, year and 32 meter set back line from the banks of a river/stream).</li> <li>Ridges.</li> <li>Cultural and historical features.</li> <li>Areas with indigenous vegetation (even if it is degraded or infested with alien species).</li> </ul> </li> <li>Whenever the slope of the site exceeds 1:10, then a contour map of the site must be submitted.</li> </ul>
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(c) For a linear activity, please also provide a description of the route.

Not Applicable

<p>Indicate the position of the activity using the latitude and longitude of the centre point of the site. The co-ordinates must be in degrees, minutes and seconds. The minutes should be given to at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.</p>	<b>Latitude (S):</b>			<b>Longitude (E):</b>		
	Oatlands Farm					
	33°	27'	18.67"	18°	23'	06.61"

(d) or:

For linear activities: <span style="color: blue;">Not Applicable</span>	<b>Latitude (S):</b>			<b>Longitude (E):</b>		
<ul style="list-style-type: none"> <li>Starting point of the activity</li> <li>Middle point of the activity</li> <li>End point of the activity</li> </ul>	°	'	"	°	'	"

**Please Note:** For linear activities that are longer than 500m, please provide an addendum with co-ordinates taken every 100 meters along the route.

## 5. SITE PHOTOGRAPHS

Colour photographs of the site and its surroundings (taken of the site and from the site) with a description of each photograph. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide a recent aerial photograph. Photographs must be attached as **Appendix C** to this report. It should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Please note that the above requirements must be duplicated for all alternative sites.

## SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

### Site/Area Description

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

#### 1. GRADIENT OF THE SITE

Indicate the general gradient of the sites (highlight the appropriate box).

Flat	Flatter than 1:10	1:10 – 1:4	Steeper than 1:4
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#### 2. LOCATION IN LANDSCAPE

(a) Indicate the landform(s) that best describes the site (highlight the appropriate box(es)).

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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(b) Please provide a description of the location in the landscape.

Oatlands Farm is situated at the end of the R307 (Old Darling Road) 17km from Darling. Oatlands is located 45km from Malmesbury on the R315. The total amount of dairy cattle being milked daily on Oatlands is 1 300. The dairy farm and housing units are situated 187m above sea level and the proposed site for the digester is situated at 177m above sea level. The area is relatively flat with only the Kapokberg 3.4km north of the far.

According to the Geo-hydrological assessment related to a manure / methane project – Starke Dairy, Western Cape conducted by GEOSS dated 14 October 2011:

A 1:250 000 scale geological map (Cape Town 3318) was used for the geological analysis. The rocks in the vicinity of Groote Post Dairy form part of the intruded Cape Granite Suite and to the west of the site is the Springfontyn Formation which is Quaternary deposits (Map 4, Appendix A).

Groote Post Dairy is situated on the Darling Pluton (N-Cd) of the Cape Granite Suite. According to Theron et al. (1992) the Darling Pluton is made up of a large variety of granites. This site is situated on the porphyritic biotite granites as well as the coarsely porphyritic granites, which constitutes the largest body. The coarsely porphyritic granites are characterised by its light colour and the presence of large (20 to 60 mm) K-feldspar phenocrysts (Theron et al., 1992). According to Theron et al. (1992) the grain size in the groundmass varies from 2 to 5 mm and may reach 9 mm. The porphyritic biotite granites are darker coloured than the coarsely porphyritic granites due to the darker mineral content. Theron et al. (1992) indicates that the K-feldspar phenocrysts are smaller (15 to 20 mm) and the average grain size in the groundmass is smaller (1 to 2 mm).

Northeast of the study site are two major, dyke shaped intrusive bodies of similar light grey, fine grained granites (Theron et al., 1992).

The aforementioned formation is overlain, to the southeast of the site by Quaternary deposits known as the Springfontyn Formation (Qs). This formation forms part of the Sandveld Group. The Springfontyn Formation in this vicinity is a well-sorted, fine- to medium- grained quartz sand (Theron et al., 1992).

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

(a) Is the site(s) located on or near any of the following (highlight the appropriate boxes)?

Shallow water table (less than 1.5m deep)	YES	<b>NO</b>	UNSURE
Seasonally wet soils (often close to water bodies)	YES	<b>NO</b>	UNSURE
Unstable rocky slopes or steep slopes with loose soil	YES	<b>NO</b>	UNSURE
Dispersive soils (soils that dissolve in water)	YES	<b>NO</b>	UNSURE
Soils with high clay content	YES	<b>NO</b>	UNSURE
Any other unstable soil or geological feature	YES	<b>NO</b>	UNSURE
An area sensitive to erosion	YES	<b>NO</b>	UNSURE
An area adjacent to or above an aquifer.	<b>YES</b>	NO	UNSURE
An area within 100m of the source of surface water	YES	<b>NO</b>	UNSURE

(b) If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department.

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

**Please refer to the Appendix G for the Geo-hydrological Assessment related to a manure / methane project – Starke Dairy, Western Cape compiled by GEOSS (Report No. G2011/09-05, 14 October 2011).**

(c) Please indicate the type of geological formation underlying the site.

<b>Granite</b>	Shale	Sandstone	Quartzite	Dolomite	Dolorite	Other (describe)
Please provide a description.						
According to the Geo-hydrological assessment related to a manure / methane project – Starke Dairy, Western Cape conducted by GEOSS dated 14 October 2011:						
<p>The Cape Granite Suite is generally classified as a “Fractured and Intergranular aquifer” (Meyer, 2001). Groundwater potential within the granites is generally low due to the lack of weathering, the permeability reducing product of weathering (feldspar weathers to clays) and lack of joints and fractures. Yields of 0.1 – 0.5 ℓ/s or 2 – 5 ℓ /s can be expected (Map , Appendix A). Groundwater target features include weathering zones, contact zones with the Malmesbury Group rocks, dyke contacts and fracturing (Meyer, 2001).</p>						

Groundwater quality within the granites is varied due to the different compositions and degree of weathering, but generally displays a sodium-chloride sulphate nature (Meyer, 2001). Electrical Conductivity generally varies between 30 and 350 mS/m and sodium, chloride, sulphate and fluoride concentrations often exceed the maximum recommended limits, and occasionally maximum allowable limits (Meyer, 2001).

The Sandveld Group is generally classified as an “Intergranular aquifer” (Meyer, 2001). Yields of 0.5 – 2 ℓ/s can be expected (Map , Appendix A). Groundwater within the Sandveld Group generally displays a sodium-chloride-alkaline nature (Meyer, 2001). The EC of the groundwater within the Sandveld Group ranges between 30 and 250 mS/m (Meyer, 2001).

#### 4. SURFACE WATER

(a) Indicate the surface water present on and or adjacent to the site and alternative sites (highlight the appropriate boxes)?

Perennial River	YES	<b>NO</b>	UNSURE
Non-Perennial River	YES	<b>NO</b>	UNSURE
Permanent Wetland	YES	<b>NO</b>	UNSURE
Seasonal Wetland	YES	<b>NO</b>	UNSURE
Artificial Wetland	YES	<b>NO</b>	UNSURE
Estuarine / Lagoonal wetland	YES	<b>NO</b>	UNSURE

(b) Please provide a description.

No surface water has been recorded on the farm.

#### 5. BIODIVERSITY

**Please note:** The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (CD) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as **Appendix D** to this report.

(a) Highlight the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category).

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	<b>No Natural Area Remaining (NNR)</b>	Not Applicable.

(b) Highlight and describe the habitat condition on site.

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing/harvesting regimes etc).
Natural	0%	

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Near Natural (includes areas with low to moderate level of alien invasive plants)	0%	
Degraded (includes areas heavily invaded by alien plants)	0%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	100%	The existing farms have been used for grazing / feeding of bovine. The area is disturbed and has no natural vegetation on the allocated sections of the farms.

(c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems <b>Not Applicable</b>		Aquatic Ecosystems <b>Not Applicable</b>						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	Endangered							
	Vulnerable							
	Least Threatened							
		YES	<b>NO</b>	UNSURE	YES	<b>NO</b>	YES	<b>NO</b>

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

No biodiversity features such as special habitats or critical or threatened species have been located on the site.

### 6. LAND USE OF THE SITE

**Please note:** The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Tourism & Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	<b>Agriculture</b>	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

(a) Please provide a description.

The location of the proposed anaerobic digester is located on the property of the Starke Dairy.

**7. LAND USE CHARACTER OF SURROUNDING AREA**

(a) Highlight the current land uses and/or prominent features that occur within +/- 500m radius of the site and neighbouring properties if these are located beyond 500m of the site.

**Please note:** The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Tourism & Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	<b>Agriculture</b>	River, stream or wetland	Nature conservation area
<b>Mountain, koppie or ridge</b>	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

(b) Please provide a description, including the distance and direction to the nearest residential area and industrial area.

The Starke Dairy is located approximately;-

- 7.8km northeast from Grotto Beach
- 8km southwest from Darling

**8. SOCIO-ECONOMIC ASPECTS**

Describe the existing social and economic characteristics of the community in order to provide baseline information.

The Waste-to-Energy project will be registered as a company on its own. The suggested split in the company will be 75% for Farmsecure and 25% for Starke Dairy. Farmsecure Carbon will be responsible for the management of the project and registration of the carbon credits and the constant supply and quality if the manure will be the responsibility of the Client.

**9. HISTORICAL AND CULTURAL ASPECTS**

(a) Please be advised that if section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), is applicable to your proposed development, then you are requested to furnish this Department with written comment from Heritage Western Cape as part of your public participation process. Section 38 of the Act states as follows: "38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
  - (i) exceeding 5 000 m2 in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m2 in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

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."

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(b) The impact on any national estate referred to in section 3(2), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii), of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), must also be investigated, assessed and evaluated. Section 3(2) states as follows: "3(2) Without limiting the generality of subsection (1), the national estate may include—

- (a) places, buildings, structures and equipment of cultural significance;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds, including—
  - (i) ancestral graves;
  - (ii) royal graves and graves of traditional leaders;
  - (iii) graves of victims of conflict;
  - (iv) graves of individuals designated by the Minister by notice in the Gazette;
  - (v) historical graves and cemeteries; and
  - (vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including—
  - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - (ii) objects to which oral traditions are attached or which are associated with living heritage;
  - (iii) ethnographic art and objects;
  - (iv) military objects;
  - (v) objects of decorative or fine art;
  - (vi) objects of scientific or technological interest; and
  - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996)."

Is section 38 of the National Heritage Resources Act, 1999, applicable to the development?		YES	<b>NO</b>
		UNCERTAIN	
If YES, explain:	Not Applicable		
Will the development impact on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999?		YES	<b>NO</b>
		UNCERTAIN	
If YES, explain:	Not Applicable		
Will any building or structure older than 60 years be affected in any way?	YES	<b>NO</b>	UNCERTAIN
If YES, explain:	Not Applicable		

**Please Note:** If uncertain, the Department may request that specialist input be provided.

### 10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

(a) Please list all legislation, policies and/or guidelines that have been considered in the preparation of this Basic Assessment Report.

LEGISLATION	ADMINISTERING AUTHORITY	TYPE Permit/ license/ authorisation/comment / relevant consideration (e.g. rezoning or consent use, building plan approval)	DATE (if already obtained):
National Environmental Management Act, Act No. 107 of 1998	Department of Environmental Affairs and Development Planning	Environmental Authorisation	This application
National Water Act, Act No. 36 of 1998	Department of Water Affairs	Possible Water Use License Application	In consultation stage
National Environmental Management: Waste Act, Act No	Department of Environmental Affairs and Development Planning	Waste Management License	This Application

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POLICY/ GUIDELINES	ADMINISTERING AUTHORITY
DEADP (2010), Guideline on Alternatives	DEADP
DEADP (2010), Guideline on Public Participation	DEADP
DEADP (2010), Guideline on Exemption Applications	DEADP
DEADP (2010), Guideline on Need and Desirability	DEADP
Government Notice Regulations No.544 Listing Notice 1: List of Activities and competent authorities	DEAT
Government Notice Regulations No. 544 Listing Notice 2: List of Activities and competent authorities	DEAT

(b) Please describe how the legislation, policies and/or guidelines were taken into account in the preparation of this Basic Assessment Report.

LEGISLATION / POLICY / GUIDELINE	DESCRIBE HOW THE LEGISLATION / POLICY / GUIDELINE WERE TAKEN INTO ACCOUNT (e.g. describe the extent to which it was adhered to, or deviated from, etc).
DEADP (2010), Guideline on Alternatives	Two possible sites and the No-Go Option have been considered in this application.
DEADP (2010), Guideline on Public Participation	No deviation of the Guideline on Public Participation has taken place up to date. The guideline was used to ensure compliance with the legislation.
DEADP (2010), Guideline on Need and Desirability	The document was used as a guideline to formulate the required information to ensure that the need and desirability of the project is addressed.
National Water Act, Act No. 36 of 1998	Sections 21(b) storing of water and (g) any activity that may have a detrimental impact on the environment are all specific water uses that will require authorisation.
National Environmental Management Act, Act No. 107 of 1998	NEMA is the basis of this application.
National Environmental Management: Waste Act 58 of 2009	NEM:WA forms the basis of the Waste Management License Application.

**Please note:** Copies of any permit(s) or licences received from any other organ of state must be attached this report as **Appendix E**.

## SECTION C: PUBLIC PARTICIPATION

The public participation process must fulfil the requirements outlined in NEMA, the EIA Regulations, and if applicable the NEM: WA and/or the NEM: AQA. This Department's *Guideline on Public Participation* (August 2010) and *Guideline on Exemption Applications* (August 2010), both of which are available on the Department's website (<http://www.capegateway.gov.za/eadp>), must also be taken into account.

**Please highlight the appropriate box to indicate whether the specific requirement was undertaken or whether there was a deviation that was agreed to by the Department.**

1. Were all potential interested and affected parties notified of the application by –		
(a) fixing a notice board at a place conspicuous to the public at the boundary or on the fence of –		
(i) the site where the activity to which the application relates is to be undertaken; and	YES	DEVIATED
(ii) any alternative site mentioned in the application;	YES	DEVIATED
(b) giving written notice to –		
(i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;	YES	N/A
(ii) the occupiers of the site where the activity is to be undertaken and to any alternative site where the activity is to be undertaken;	YES	DEVIATED

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(iii) owners and occupiers of land adjacent to the site where the activity is to be undertaken and to any alternative site where the activity is to be undertaken;	<b>YES</b>	DEVIATED	
(iv) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	<b>YES</b>	DEVIATED	
(v) the municipality which has jurisdiction in the area;	<b>YES</b>	DEVIATED	
(vi) any organ of state having jurisdiction in respect of any aspect of the activity; and	<b>YES</b>	DEVIATED	
(vii) any other party as required by the competent authority;	<b>YES</b>	DEVIATED	
I placing an advertisement in -			
(i) one* local newspaper; and	<b>YES</b>	DEVIATED	
(ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	YES	DEVIATED	<b>N/A</b>
(d) placing an advertisement in at least one* provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken.	YES	DEVIATED	<b>N/A</b>

\* **Please note:** In terms of the NEM: WA and NEM: AQA a notice must be placed in at least two newspapers circulating in the area in which the activity applied for is to be carried out.

2. Provide a list of all the state departments that were consulted:
Department of Environmental Affairs and Development Planning – Land Management
Department of Environmental Affairs and Development Planning – Waste Management
Department of Water Affairs
Department of Agriculture
Heritage Western Cape

3. Please provide an overall summary of the Public Participation Process that was followed. (The detailed outcomes of this process must be included in a comments and response report to be attached to the final Basic Assessment Report (see note below) as <b>Appendix F</b> ).
<b>Written notices have been sent to the abovementioned state departments, the local and district municipality, landowner and surrounding landowners.</b>
<b>Site Notices have been placed on site alternatives 1 and 2 (no. of 4 notices)</b>
<b>Legal advertisement has been placed in the local newspaper (TygerBurger) and regional newspaper (Die Burger).</b>

**Please note:**

Should any of the responses be “No” and no deviation or exemption from that requirement was requested and agreed to /granted by the Department, the Basic Assessment Report will be rejected.

A list of all the potential interested and affected parties, including the organs of State, notified and a list of all the register of interested and affected parties, must be submitted with the final Basic Assessment Report. The list of registered interested and affected parties must be opened, maintained and made available to any person requesting access to the register in writing.

The draft Basic Assessment Report must be submitted to the Department before it is made available to interested and affected parties, including the relevant organs of State and State departments which have jurisdiction with regard to any aspect of the activity, for a 40-day commenting period. With regard to State departments, the 40-day period commences the day after the date on which the Department as the competent/licensing authority requests such State department in writing to submit comment. The applicant/EAP is therefore required to inform this Department in writing when the draft Basic Assessment Report will be made available to the relevant State departments for comment. Upon receipt of the Draft Basic Assessment Report and this confirmation, this Department will in accordance with Section 24O(2)

and (3) of the NEMA request the relevant State departments to comment on the draft report within 40 days.

All comments of interested and affected parties on the draft Basic Assessment Report must be recorded, responded to and included in the Comments and Responses Report included as **Appendix F** to the final Basic Assessment Report. If necessary, any amendments in response to comments received must be effected in the Basic Assessment Report itself. The Comments and Responses Report must also include a description of the public participation process followed.

The final Basic Assessment Report must be made available to registered interested and affected parties for comment before submitting it to the Department for consideration. Unless otherwise indicated by the Department, a final Basic Assessment Report must be made available to the registered interested and affected parties for comment for a minimum of 21-days. Comments on the final Basic Assessment Report does not have to be responded to, but the comments must be attached to the final Basic Assessment Report.

The minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants must also be submitted as part of the public participation information to be attached to the final Basic Assessment Report as **Appendix F**.

Proof of all the notices given as indicated, as well as of notice to the interested and affected parties of the availability of the draft Basic Assessment Report and final Basic Assessment Report must be submitted as part of the public participation information to be attached to the final Basic Assessment Report as **Appendix F**.

## SECTION D: NEED AND DESIRABILITY

**Please Note:** Before completing this section, first consult this Department's *Guideline on Need and Desirability* (August 2010) available on the Department's website (<http://www.capegateway.gov.za/eaddp>)

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The proposed development will not require the rezoning of the properties. The development will ensure more sufficient management of the pig and bovine manure and the re-use of the solids as soil application and the irrigation of treated effluent on pastures.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
The proposed development will be an improvement of existing farming practices and will not impact on people, social needs and natural resources.			
(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain
The proposed development will take place outside the urban edge.			
(c) Integrated Development Plan and Spatial Development Framework of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO	Please explain
Not Applicable.			
(d) Approved Structure Plan of the Municipality	YES	NO	Please explain
Not Applicable.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
The proposed development will not compromise the integrity of the existing environmental management priorities. The development will ensure the generation of electricity from methane gas producers, improve the quality of treated effluent to be irrigated and improve the quality of solids used as soil application.			
(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain
Not Applicable.			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
The development reduces the carbon footprint of the farm and thus the Municipality and is in line with the drive toward renewable energy sources in the short to medium term			
4. Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	YES	NO	Please explain
Not Applicable.			

5. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	NO	Please explain
The development will create construction jobs in the short term and skilled and semi-skilled jobs in the medium to long term and the labour will be sourced from the surrounding communities. The renewable energy aspect of the project will reduce demand on importing electricity from coal fired power stations very remotely located from the site. Although the demand reduction will be small it does have a proportionately larger effect on the voltage drop over distance thus leading to significant increase in efficiency			
6. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as <b>Appendix E.</b> )	YES	NO	Please explain
The necessary services will be adequate for the proposed development.			
7. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as <b>Appendix E.</b> )	YES	NO	Please explain
The development does not form part of the infrastructure development of the Municipality.			
8. Is this project part of a national programme to address an issue of national concern or importance?	YES	NO	Please explain
According to the National Climate Change Response Strategy for South Africa (DEAT, September 2004) methane gas is one of the most important greenhouse gasses. The concentration of methane gas has increased by 150% since the start of the industrial era. The intervention to "Reduce greenhouse gas emission in the agricultural sector through the National Department of Agriculture", the proposed development conform to Section 2 "Extending feedlot manure management to include anaerobic digestion and the collection and use of the methane gas produced.			
9. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	NO	Please explain
The proposed development will form part of the daily functions of the farm operations and will not require the transportation of manure, etc. it will also mitigate some of the environmental effects that the irrigation of untreated manure effluent have on the receiving environment.			
10. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	YES	NO	Please explain
The proposed development will impact positively on sensitive natural or cultural areas due to the reduction in the current effects of the farming practice such as odors.			
11. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc)?	YES	NO	Please explain
The proposed development will only be an improvement and odours and the spreading of untreated manure will be prevented. The solids and liquid applied to the land have been organically broken down and now serve as a positive soil improvement product.			
12. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	YES	NO	Please explain
Not Applicable.			

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13. What will the cumulative impacts (positive and negative) of the proposed land use associated with the activity applied for, be?	<b>YES</b>	NO	Please explain
<p>The proposed development will ensure that groundwater resources are not polluted since the digesters will be lined. Treated effluent that will be irrigated will comply with standards within the National Water Act, Act No. 36 of 1998. The anaerobic process will ensure the breakdown of any harmful bacteria and substances in the animal manure. The extraction of methane gas and transformation thereof to electricity not only reduces methane emissions but also assist in the alleviation of electricity pressure and usage. The proximity of the generation plant to the end user reduces energy wastage due to the voltage drop over distance.</p>			
14. Is the development the best practicable environmental option for this land/site?	<b>YES</b>	NO	Please explain
<p>The proposed development will ensure that groundwater resources are not polluted since the digesters will be lined. Treated effluent that will be irrigated will comply with standards within the National Water Act, Act No. 36 of 1998. The anaerobic process will ensure the breakdown of any harmful bacteria and substances in the animal manure. The extraction of methane gas and transformation thereof to electricity not only reduces methane emissions but also assist in the alleviation of electricity pressure and usage. The proposed development will address the reduction of greenhouse gasses by feedlot manure management. The combustion of methane only produces carbon dioxide as an emission and no harmful gases are released into the atmosphere.</p>			
15. What will the benefits be to society in general and to the local communities?			Please explain
<p>Local jobs will be created and the reliance on coal fired power stations is reduced. The project will also serve as an example going forward of how integrated waste management and the proposed national waste hierarchical strategy can be beneficial.</p>			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
<p>Not Applicable.</p>			

(17) Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account:

<p>In terms of Section 23 of NEMA, an integrated and holistic approach was followed during the impact assessment of the proposed upgrade on the environmental, social, cultural and economical aspects.</p> <p>The Basic Assessment Report outlines the issues and concerns raised by Organs of State and the Public, identifying potential positive and negative impacts on the environment and its surroundings. The BAR also makes provision for a precautionary approach, as well as for the prevention of impacts, mitigation and rehabilitation where respectively required.</p> <p>The Report also addresses the issues and concerns raised by Organs of State and the Public, as adequate public participation was conducted where the public and surrounding property owners were notified and given the opportunity to raise issues and provide feedback on the proposed upgrade.</p>
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(18) Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account:

During the assessment of the environment and socio-economic aspects of the proposed development of the Darling Road Renewable Energy Project, the following aspects of Section 2 of NEMA have been taken into consideration:

- The environmental management of the proposed project takes into consideration the people and their needs and the proposed project does serve their physical, physiological, development cultural and social interests equitably. During the assessment the conservation of all cultural resources and social interests of the public were taken into account.
- The proposed development will be socially, environmentally and economically sustainable.
- The proposed upgrade is sustainable – The proposed upgrade will take place within the existing boundaries not impacting on vacant or virgin soil. The proposed upgrading of the stormwater system will minimise erosion that will better the integrity of the environment and its surroundings. The proposed upgrade will not jeopardise the environment, as exploration of renewable resources and ecosystems are not required.
- The Basic Assessment process follows an integrated and holistic approach to ensure that the proposed upgrade acknowledges all the elements of the environment.
- The attached draft Environmental Management Programme (See **Appendix H** of the BAR) outlines all precautionary and mitigation measures for sustainable development and conservation of all natural and cultural resources. The Client, Engineers and Contractor will all have a duty of care to ensure that no harm is done and should harm be done to the environment due to pollution or degradation of the environment the polluter pays principle will be relevant.
- The alternative assessment was limited to the preferred and existing alignment, and the No-Go Option. The preferred alternative has been considered as the Best Practical Environmental Option (BPEO) in terms of social, cultural, natural and economical aspects for the proposed upgrade. Please refer to Section E of the Basic Assessment Report (BAR) for the alternatives assessment.
- The BAR, specialist input and issues raised by all Interested and Affected Parties were made available to the public to ensure transparency in terms of S2 of NEMA. The Public Participation Process was conducted as outlined in the Guideline on Public Participation.
- The proposed upgrade will not negatively influence environmental justice and equity.

## SECTION E: ALTERNATIVES

**Please Note:** Before completing this section, first consult this Department's *Guideline on Alternatives* (August 2010) available on the Department's website (<http://www.capegateway.gov.za/eadp>).

"Alternatives", in relation to a proposed activity, means different means of meeting the general purposes and requirements of the activity, which may include alternatives to –

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

The NEMA prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, with respect to every application for environmental authorisation –

- ensure that the general objectives of integrated environmental management laid down in NEMA and the National Environmental Management Principles set out in NEMA are taken into account; and
- include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.

The general objective of integrated environmental management is, *inter alia*, to "identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management" set out in NEMA.

1. In the sections below, please provide a description of any identified and considered alternatives and alternatives that were found to be feasible and reasonable.

**Please note:** Detailed written proof the investigation of alternatives must be provided and motivation if no reasonable or feasible alternatives exist.

- (a) Property and location/site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

The Starke Dairy has been identified as the only option for the proposed development of the Waste-to-Energy facility. Six (6) lagoon systems where slurry is anaerobically treated is located on site.

- (b) Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

Activity alternatives were not assessed during the process.

- (c) Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

The design and layout is a standardised layout from this type of plant as provided from international suppliers.

- (d) Technology alternatives (e.g. to reduce resource demand and resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

The option for gas turbine engines was initially considered but the amount of methane produces was insufficient for this option.

- (e) Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

No operational alternatives were assessed.

(f) the option of not implementing the activity (the No-Go Option):

Should the proposed development not take place the exiting operation of the farms will continue as is. The bovine and pig manure will be treated, which will contribute to the methane emissions in the atmosphere. Higher quality treated effluent for irrigation; fertiliser and electivity produced from methane extraction will not take place.

(g) Other alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts, or detailed motivation if no reasonable or feasible alternatives exist:

None.

(h) Please provide a summary of the alternatives investigated and the outcomes of such investigation:

**Please note:** If no feasible and reasonable alternatives exist, the description and proof of the investigation of alternatives, together with motivation of why no feasible or reasonable alternatives exist, must be provided.

From an operational point of view, the location of the anaerobic digester has been identified as the preferred location because of its low altitude. Bovine manure from the feedlot and pig manure from the piggery can be easily transported to the digester. .

The design is a standardised layout as provided by international suppliers.

## SECTION F: IMPACT ASSESSMENT, MANAGEMENT, MITIGATION AND MONITORING MEASURES

**Please note:** The information in this section must be duplicated for all the feasible and reasonable alternatives (where relevant).

### 1. PLEASE DESCRIBE THE MANNER IN WHICH THE DEVELOPMENT WILL IMPACT ON THE FOLLOWING ASPECTS:

(a) Geographical and physical aspects:

According to the specialist study conducted by GEOSS it was evident that no contamination of the boreholes has taken place, which supplies the storage tanks of water. But according to the national scale groundwater vulnerability map the dairy farm is located on an area with a 'high' groundwater vulnerability and the boreholes south-east of the dairy farm that supply the dairy, are located in a groundwater zone with a 'very high' vulnerability rating. Thus the borehole contamination risk is concluded to be low; however the risk to the groundwater in the area from surface based non-point source contamination sources ranges from 'high' to 'very high'. It is thus important that any potential impacts from contamination sources are minimised.

The land use of the property will remain unchanged and will only improve the management of dairy on the farm.

The proposed development will also take place within the boundaries of the farm and will be limited to already disturbed areas.

(b) Biological aspects:

Will the development have an impact on critical biodiversity areas (CBAs) or ecological support areas (CSAs)?	YES	NO
If yes, please describe:		
Not Applicable.		
Will the development have an impact on terrestrial vegetation, or aquatic ecosystems (wetlands, estuaries or the coastline)?	YES	NO
If yes, please describe:		
The proposed development will produce treated effluent that will be utilised for irrigation and the separated solid will be used for soil application, which will comply with the necessary legislations.		
Will the development have an impact on any populations of threatened plant or animal species, and/or on any habitat that may contain a unique signature of plant or animal species?	YES	NO
If yes, please describe:		
Not Applicable.		
Please describe the manner in which any other biological aspects will be impacted:		
The anaerobic process will ensure the breakdown of any harmful bacteria and substances in the animal manure. The treated effluent will be utilized for irrigation which will limit the use of natural resources and the solids will be used as soil application.		
The extraction of methane gas and transformation thereof to electricity not only reduces methane emissions but also assist in the alleviation of electricity pressure and usage. The proposed development will address the reduction of greenhouse gases by feedlot manure management. The combustion of methane only produces carbon dioxide as an emission and no harmful gases are released into the atmosphere.		

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(c) Socio-Economic aspects:

What is the expected capital value of the activity on completion?	R 14 800 000.00
What is the expected yearly income or contribution to the economy that will be generated by or as a result of the activity?	R 5 300 000.00
Will the activity contribute to service infrastructure?	YES <b>NO</b>
How many new employment opportunities will be created in the construction phase of the activity?	Approx. 105
What is the expected value of the employment opportunities during the construction phase?	R 4 300 000.00
What percentage of this will accrue to previously disadvantaged individuals?	+/- 40%
How will this be ensured and monitored (please explain):	
<p>The tender documentation will specify involvement of PDI and HDIs and the contract will be awarded on this basis.</p> <p>The company responsible for supervision of the contract will ensure continued compliance to specifications</p>	
How many permanent new employment opportunities will be created during the operational phase of the activity?	4
What is the expected current value of the employment opportunities during the first 10 years?	R 1 800 000.00
What percentage of this will accrue to previously disadvantaged individuals?	90%
How will this be ensured and monitored (please explain):	
Farmsecure will manage the appointment of such personnel and will insure that this policy is implemented over the long term	
Any other information related to the manner in which the socio-economic aspects will be impacted:	
No.	

(d) Cultural and historic aspects:

The proposed development will not impact on any cultural and historical aspects.
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## 2. WASTE AND EMISSIONS

(a) Waste (including effluent) management

Will the activity produce waste (including rubble) during the construction phase?	<b>YES</b> NO
If yes, indicate the types of waste (actual type of waste, e.g. oil, and whether hazardous or not) and estimated quantity per type?	125 m <sup>3</sup>
As with normal construction activities some general municipal waste such as plastic, paper and building rubble will be produced in small quantities.	
Will the activity produce waste during its operational phase?	<b>YES</b> NO
If yes, indicate the types of waste (actual type of waste, e.g. oil, and whether hazardous or not) and estimated quantity per type?	71 ton/day
Where and how will the waste be treated / disposed of (describe)?	
If yes, indicate the types of waste (actual type of waste, e.g. oil, and whether hazardous or not) and estimated quantity per type per phase of the development?	
<p>The waste is non hazardous digestate which consists of treated effluent and up to 10% solids which are separated and used as soil amendment on the farms; the effluent is then used for irrigating from a lined lagoon. The lagoon is 4 000m<sup>3</sup>.</p> <p>14 tons is separated for soil amendment and 18 tons sent back to the digester as part of the process, the remaining effluent is sent to the lagoon.</p>	
Has the municipality or relevant authority confirmed that sufficient capacity exist for treating / disposing of the waste to be generated by this activity(ies)? If yes, provide written confirmation from Municipality or relevant authority	YES <b>NO</b>

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Will the activity produce waste that will be treated and/or disposed of at another facility other than into a municipal waste stream?	<b>YES</b>	NO
If yes, has this facility confirmed that sufficient capacity exist for treating / disposing of the waste to be generated by this activity(ies)? Provide written confirmation from the facility and provide the following particulars of the facility:	<b>YES</b>	NO
Does the facility have an operating license? (If yes, please attach a copy of the license.)	<b>YES</b>	NO
Facility name: <u>The effluent is irrigated on the farm and the solids used as soil amendment.</u>		
Contact person: <u>Michiel Meets</u>		
Postal address: <u>PO Box 4138</u>		
<u>Tygervalley</u>	Postal code: <u>7536</u>	
Telephone: <u>(021) 974 1900</u>	Cell: <u>082 553 5431</u>	
E-mail: <u>michiel.meets@farmsecure.co.za</u>	Fax: <u>086 680 0067</u>	

Describe the measures that will be taken to reduce, reuse or recycle waste:
<p>The project is aimed at reducing current waste by treating the animal manure and generating power as a renewable energy source.</p> <p>This organically breaks down the waste to a more stable form of soil amendment and significantly reduces the amount of methane release to the atmosphere in turn greatly reducing the greenhouse gas effect of the farming activity.</p>

(b) Emissions into the atmosphere

Will the activity produce emissions that will be disposed of into the atmosphere?	<b>YES</b>	NO
If yes, does it require approval in terms of relevant legislation?	YES	<b>NO</b>
Describe the emissions in terms of type and concentration and how it will be treated/mitigated:		
<p>The digester stops methane produced by the breaking down of manure from release into the atmosphere.</p> <p>The methane is combusted in an internal combustion engine and this reduces it to carbon dioxide that is then released into the atmosphere. The greenhouse effect of CO<sub>2</sub> is at least 20 times less than CH<sub>4</sub>.</p>		

### 3. WATER USE

Please indicate the source(s) of water for the activity by ticking the appropriate box(es)

Municipal	Water board	Groundwater	River, Stream, Dam or Lake	Other	<b>The activity will not use water</b>
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If water is to be extracted from a groundwater source, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	m <sup>3</sup>
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Please provide proof of assurance of water supply (eg. Letter of confirmation from municipality / water user associations, yield of borehole)		
Does the activity require a water use permit / license from DWAF?	<b>YES</b>	NO
If yes, please submit the necessary application to Department of Water Affairs and attach proof thereof to this application.		
Describe the measures that will be taken to reduce water demand, and measures to reuse or recycle water:		
<p>The activity (anaerobic digestion of manure) does not require water but the treated effluent is irrigated and in this regard an authorisation has been lodged with the Department of Water Affairs.</p> <p>Please note that the dairy is supplies with water from the existing boreholes.</p>		

**4. POWER SUPPLY**

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

This project generates its own power from the combustion of methane and the generation of power as a renewable energy project

If power supply is not available, where will power be sourced from?

See above

**5. ENERGY EFFICIENCY**

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

This activity is specifically designed to use a renewable energy source and to reduce the environmental impact of existing farming activities. The plant is designed to be very energy efficient in order to be able to sell as much power as possible to extend the economic viability of the project.

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

This is an alternative energy project.

**6. DESCRIPTION AND ASSESSMENT OF THE SIGNIFICANCE OF IMPACTS PRIOR TO AND AFTER MITIGATION**

**Please note:** While sections are provided for impacts on certain aspects of the environment and certain impacts, The sections should also be copied and completed for all other impacts.

(a) **Impacts that may result from the planning, design and construction phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the planning, design and construction phase.**

<b>Potential impacts on geographical and physical aspects:</b>	
Nature of impact:	<b>Erosion</b>
Extent and duration of impact:	<b>Local &amp; Short Term (during construction)</b>
Probability of occurrence:	<b>May occur after heavy rain.</b>
Degree to which the impact can be reversed:	<b>Completely rehabilitated</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>N/A</b>
Cumulative impact prior to mitigation:	<b>N/A</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>- <b>Ongoing monitoring of construction area shall take place, especially after a rain event.</b></li> <li>- <b>Adequate stormwater drainage will form part of the proposed upgrade.</b></li> <li>- <b>The stabilisation methods shall be investigated, especially due to construction activities taking place within the river bed, and at cross-drainage pipe outlets to disperse the water channelled through the pipes.</b></li> </ul>

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Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>

<b>Potential impact on biological aspects:</b>	
Nature of impact:	<b>Excavations</b>
Extent and duration of impact:	<b>Local, Short term (during construction period)</b>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact can be reversed:	<b>To its original state.</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be mitigated:	<b>High</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>- <b>Vegetation and topsoil shall be stockpiled together within the cadastral boundary of the site.</b></li> <li>- <b>Topsoil and organic matter shall be redistributed over the disturbed area.</b></li> </ul>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>

<b>Potential impacts on socio-economic aspects:</b>	
Nature of impact:	<b>Job creation</b>
Extent and duration of impact:	<b>Short term (duration of the construction phase)</b>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact can be reversed:	<b>Medium</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be mitigated:	<b>High</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>- <b>Workers shall be prevented from entering adjacent properties.</b></li> <li>- <b>The access road for adjacent farmers will be discussed and managed. Access to property will be maintained during construction. Temporary deviations might have to be build when construction influences the existing access.</b></li> </ul>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>

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<b>Potential impacts on cultural-historical aspects:</b>	
Nature of impact:	<b>Damage to any historical aspects</b>
Extent and duration of impact:	<b>Local, Short term (during construction)</b>
Probability of occurrence:	<b>Low</b>
Degree to which the impact can be reversed:	<b>Medium</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be mitigated:	<b>Medium</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>- <b>Precaution shall be taken to prevent the removal of fossils, coins, human remains, articles of value or antiques and other items of archaeological or paleontological significance.</b></li> <li>- <b>The appointed Environmental Control Officer (ECO) and local heritage authority must be contacted should any artefacts be uncovered.</b></li> </ul>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low to Neutral</b>
<b>Potential noise impacts:</b>	
Nature of impact:	<b>Impact of noise generated by the construction activities</b>
Extent and duration of impact:	<b>Local, Short term (during construction period)</b>
Probability of occurrence:	<b>Probable</b>
Degree to which the impact can be reversed:	<b>Low</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Low</b>
Cumulative impact prior to mitigation:	<b>Low</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>
Degree to which the impact can be mitigated:	<b>Low</b>
Proposed mitigation:	<ul style="list-style-type: none"> <li>- <b>Noise generated by the construction activities will be regulated and managed via the CEMP and Occupation Health and Safety (OHS) Regulations.</b></li> <li>- <b>Construction activities shall be restricted to normal working hours (07h00 to 17h00 during weekdays) and if required every second Saturday.</b></li> <li>- <b>Forum for complaints to be raised shall be provided.</b></li> </ul>
Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low</b>

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<b>Potential visual impacts:</b>	
Nature of impact:	Impact of construction activity on the views of surrounding farmers Impact of littering / pollution generated by the construction activities on the surrounding environment.
Extent and duration of impact:	Local, Short term (during construction period)
Probability of occurrence:	Possible to Probable
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> <li>- As described in the impact on vegetation above, the disturbed areas shall be stabilized, landscaped and allowed to re-vegetate naturally.</li> <li>- Suitable refuse disposal facilities shall be provided. This includes weather and scavenger proof bins, designated eating areas and a program for regular collection and removal of waste to an approved facility.</li> <li>- The appointed ECO shall monitor the construction phase.</li> </ul>
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

(b) **Impacts that may result from the operational phase** (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the operational phase.

<b>Potential impacts on the geographical and physical aspects:</b>	
Nature of impact:	Impact of the proposed development on the surrounding environment and stormwater run-off
Extent and duration of impact:	Local, Medium Term
Probability of occurrence:	Probable
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low-Medium
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low- Medium (+)
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> <li>- Stormwater channels shall be monitored and maintained to ensure efficient flow and disposal.</li> </ul>

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Cumulative impact post mitigation:	<b>Low</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Low (+)</b>

<b>Potential impact biological aspects:</b>	<b>No impact during the operational phase of the project.</b>
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential impacts on the socio-economic aspects:</b>	
Nature of impact:	<b>Impact of the development of job creation</b>
Extent and duration of impact:	<b>Low, Long term</b>
Probability of occurrence:	<b>Definite</b>
Degree to which the impact can be reversed:	<b>N/A</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>N/A</b>
Cumulative impact prior to mitigation:	<b>N/A</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>N/A</b>
Degree to which the impact can be mitigated:	<b>N/A</b>
Proposed mitigation:	<b>- Make use of local labourers.</b>
Cumulative impact post mitigation:	<b>N/A</b>
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>Medium (+)</b>

<b>Potential impacts on the cultural-historical aspects:</b>	
Nature of impact:	<b>Impact of historical and cultural aspects</b>
Extent and duration of impact:	<b>N/A</b>
Probability of occurrence:	<b>N/A</b>
Degree to which the impact can be reversed:	<b>N/A</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>N/A</b>
Cumulative impact prior to mitigation:	<b>N/A</b>
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	<b>N/A</b>
Degree to which the impact can be mitigated:	<b>N/A</b>

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Proposed mitigation:	N/A
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	N/A

<b>Potential noise impacts:</b>	<b>No additional noise will be generated during the operational phase</b>
Nature of impact:	N/A
Extent and duration of impact:	N/A
Probability of occurrence:	N/A
Degree to which the impact can be reversed:	N/A
Degree to which the impact may cause irreplaceable loss of resources:	N/A
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	N/A
Degree to which the impact can be mitigated:	N/A
Proposed mitigation:	N/A
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	N/A

<b>Potential visual impacts:</b>	<b>Impact of construction activity on the views of surrounding farmers</b>
Nature of impact:	Low
Extent and duration of impact:	Long term
Probability of occurrence:	Possible
Degree to which the impact can be reversed:	Medium to Low
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	N/A
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (+)

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- (c) Impacts that may result from the **decommissioning and closure phase** (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase.

**Please note:** The possible decommissioning of the development has not been considered in this application. If the need arise to decommission the infrastructure, a decision would need to be made as to whether the infrastructure would be removed or left in situ.

<b>Potential impacts on the geographical and physical aspects:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential impact biological aspects:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential impacts on the socio-economic aspects:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential impacts on the cultural-historical aspects:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	

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Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential noise impacts:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

<b>Potential visual impacts:</b>	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

**(d) Any other impacts:**

Potential impact:	
Nature of impact:	
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

## 7. SPECIALIST INPUTS/STUDIES AND RECOMMENDATIONS

**Please note:** Specialist inputs/studies must be attached to this report as **Appendix G**. Also take into account the Department's Guidelines on the Involvement of Specialists in EIA Processes available on the Department's website (<http://www.capegateway.gov.za/eadp>).

Specialist inputs/studies and recommendations:

According to the Geo-hydrological assessment conducted by GEOSS in October 2011, "the water supply to the dairy is derived from boreholes which are pumped and the water stored in storage tanks, which are at a higher risk than the dairy. The water is the gravity to fed the dairy. Based on the analysis of the water from the storage from the storage tanks the water quality is "poor". Microbiologically the water us not contaminated, which is good. However it is anticipated that there will be a general improvement in the dairy if the water quality can be improved. It is proposed that the borehole monitoring programme be implemented and that groundwater samples are collected from the production boreholes and analysed. The poo water quality is not typically associated with the granitic terrain and a geo-hydrological study should be completed to identify other borehole sites that will yield better quality groundwater. As part of such a study it will be beneficial to log any unequipped boreholes to measure the change in water quality with depth.

"...the implementation of an improved waste management system should proceed without delay. It will reduce the risk of groundwater contamination as well."

## 8. IMPACT SUMMARY

Please provide a summary of all the above impacts.

During the assessment of the proposed development the positive impacts of the development outweighs the possible negative impacts. The development will assist in the decrease of methane gas, which is one of the three most important greenhouse gases. The development will also treat manure anaerobically to produce effluent for irrigation and solids for soil application. The methane gas extracted will be utilised for electricity generation. The proposed development will also reduce the risk of groundwater contamination.

The lining of the proposed lagoons must be lined to ensure the conservation and protection of groundwater resources.

## 9. OTHER MANAGEMENT, MITIGATION AND MONITORING MEASURES

(a) Over and above the mitigation measures described in Section 6 above, please indicate any additional management, mitigation and monitoring measures.

Please refer to the attached draft Environmental Management Programme (EMP).

(b) Describe the ability of the applicant to implement the management, mitigation and monitoring measures.

Possible negative impacts will predominantly occur during the construction phase. The applicant will appoint a suitably qualified Environmental Control Officer (ECO) to oversee/monitor the implementation of the CEMP and to advice the contractor/client during the construction phase.

During the operational phase, a qualified Geo-hydrologist must be appointed to monitor and analyse the quality of groundwater resources on an annual basis.

**Please note:** A draft **ENVIRONMENTAL MANAGEMENT PROGRAMME** must be attached this report as **Appendix H**.

## SECTION G: ASSESSMENT METHODOLOGIES AND CRITERIA, GAPS IN KNOWLEDGE, UNDERLYING ASSUMPTIONS AND UNCERTAINTIES

(a) Please describe adequacy of the assessment methods used.

The assessment involved several site visits, consultation with specialists and intensive stakeholder involvement. All the comments, concerns and specialists opinions were considered and incorporated into this report. The assessment was also conducted using Section 2 and 23 of NEMA as the guidelines for the objectives and outcomes of this study.

(b) Please describe the assessment criteria used.

This study was the assessment of the proposed development on the environment.

The main issues identified were water related issues and the protection and conservation of groundwater resources. Hence, the criteria used for the assessment were based on the geo-hydrological impacts.

The proposed development will take place within the property boundaries on disturbed land. The study is not within the Critical Biodiversity Area.

(c) Please describe the gaps in knowledge.

The quality data of treated effluent to be irrigated from other operating plants will be tested to ensure that the quality of treated effluent complies with the standards limits required by the Department of Water Affairs.

(d) Please describe the underlying assumptions.

All the possible impacts due to the construction were identified and the CEMP was written accordingly to mitigate/avoid the identified and unforeseen impacts.

The recommendations made in this study were based on the assumption that the contractor will implement and adhere to the CEMP accordingly.

It was also assumed that a suitable qualified ECO will be appointed to monitor and advise on the implementation of the CEMP.

(e) Please describe the uncertainties.

Although a thorough study was conducted and the CEMP was written to prevent impacts, it is uncertain if any unforeseen impacts/accidents might occur during the construction phase.

The ECO must also manage and make recommendations if any unforeseen impacts occur that is not provided for in the CEMP.

## SECTION H: RECOMMENDATION OF THE EAP

In my view (EAP), the information contained in this application form and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for.	<b>YES</b>	NO
If "NO", list the aspects that should be further assessed through additional specialist input/assessment or whether this application must be subjected to a Scoping & EIR process before a decision can be made:		
The authorisation from The Department of Water Affairs needs to be obtained prior to the commencement of the construction activities. A copy of the Water Use License Application will be included in the Final Basic Assessment Report. The Water Use License will be issued on receipt of the Environmental Authorisation.		
If "YES", please indicate below whether in your opinion the activity should or should not be authorised:		
Activity should be authorised:	<b>YES</b>	NO
Please provide reasons for your opinion		
The proposed development addresses options for the decrease of greenhouse gasses, in this case methane gas, increasing the quality of treated effluent and fertiliser by making use of anaerobic digestion, and the protection and conservation of groundwater resources.		
If you are of the opinion that the activity should be authorised, then please provide any conditions, including mitigation measures that should in your view be considered for inclusion in an authorisation.		
<ul style="list-style-type: none"> <li>• An Environmental Control Officer should be appointed to ensure compliance with the Environmental Authorisation and approved Environmental Management Programme (EMP). This appointment must be done prior to site establishment.</li> <li>• Environmental Awareness Training must be conducted prior to the commencement of construction activities.</li> <li>• The ECO is to conduct a follow-up site assessment 8 months after the last date of construction.</li> <li>• Environmental Method Statements to be compiled and submitted by the Contractor prior to site establishment. The method statements must be approved by the ECO and Blaauwberg Administration prior to the commencement of activities.</li> <li>• An Occupational Health and Safety Officer must be appointed to ensure compliance with the Occupational Health and Safety Act during the construction phase</li> <li>• The Stormwater Management Plan must be approved by the Department of Environmental Affairs and Development Planning and the Department of Water Affairs.</li> <li>• The construction site and any open excavations must be demarcated.</li> <li>• Construction activities shall be limited to normal working hours, and will not be permitted on Sunday and Public Holidays.</li> <li>• No fishing or killing of animals will be allowed on site.</li> <li>• Swimming, drinking or washing of clothes on the farm is strictly prohibited.</li> <li>• The Contractor to supply mobile ablution facilities. Any spillages must be reported to the ECO and Site Engineers immediately.</li> <li>• No fires will be allowed on site.</li> <li>• Rehabilitation and revegetation will require only indigenous vegetation (vegetation of the surrounding or Western Cape region).</li> </ul>		
Duration and Validity: Environmental authorisations are usually granted for a period of three years from the date of issue. Should a longer period be required, the applicant/EAP is requested to provide a detailed motivation on what the period of validity should be.		
Duration and validity for a period of three year will suffice.		

## SECTION I: APPENDICES

The following appendices must be attached to this report:

Appendix		Tick the box if Appendix is attached
Appendix A:	Locality map	✓
Appendix B:	Site plan(s)	✓
Appendix C:	Photographs	✓
Appendix D:	Biodiversity overlay map	✓
Appendix E:	Permit(s) / license(s) from any other organ of state including service letters from the municipality	✓
Appendix F:	Public participation information: including a copy of the register of interested and affected parties, the comments and responses report, proof of notices, advertisements and any other public participation information as required in Section C above.	✓
Appendix G:	Specialist Report(s)	✓
Appendix H :	Environmental Management Programme	✓
Appendix I:	Additional information related to listed waste management activities (if applicable)	✓
Appendix J:	Any Other (if applicable) – Waste Management License Application	✓

## DECLARATIONS

### THE APPLICANT

I ....., in my personal capacity or duly authorised (please circle the applicable option) by ..... thereto hereby declare that I:

- regard the information contained in this report to be true and correct, and
- am fully aware of my responsibilities in terms of the National Environmental Management Act of 1998 ("NEMA") (Act No. 107 of 1998), the Environmental Impact Assessment Regulations ("EIA Regulations") in terms of NEMA (Government Notice No. R. 543 refers), and the relevant specific environmental management Act, and that failure to comply with these requirements may constitute an offence in terms of the environmental legislation;
- appointed the environmental assessment practitioner as indicated above, which meet all the requirements in terms of regulation 17 of GN No. R. 543, to act as the independent environmental assessment practitioner for this application;
- have provided the environmental assessment practitioner and the competent authority with access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the environmental legislation including but not limited to –
  - costs incurred in connection with the appointment of the environmental assessment practitioner or any person contracted by the environmental assessment practitioner;
  - costs incurred in respect of the undertaking of any process required in terms of the regulations;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the regulations;
  - costs in respect of specialist reviews, if the competent authority decides to recover costs; and
  - the provision of security to ensure compliance with the applicable management and mitigation measures;
- am responsible for complying with the conditions that might be attached to any decision(s) issued by the competent authority;
- have the ability to implement the applicable management, mitigation and monitoring measures;
- hereby indemnify, the government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of, inter alia, the content of any report, any procedure or any action for which the applicant or environmental assessment practitioner is responsible; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

**Please Note:** If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

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Signature of the applicant:

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Name of company:

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Date:

**THE INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

I ....., as the appointed independent environmental practitioner ("EAP") hereby declare that I:

- act/ed as the independent EAP in this application;
- regard the information contained in this report to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the application was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- have ensured that the comments of all interested and affected parties were considered, recorded and submitted to the competent authority in respect of the application;
- have kept a register of all interested and affected parties that participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

**Note:** The terms of reference must be attached.

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Signature of the environmental assessment practitioner:

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Name of company:

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Date:

**THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS**

I ....., as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

**Note:** The terms of reference must be attached.

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Signature of the specialist:

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Name of company:

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Date: