AFGRI Poultry (Pty) Ltd

Basic Assessment Process

Locality: Sundra

Departmental Ref No: 17/2/3 N-242

SHANGONI
Management Services (Pty) Ltd

DRAFT BASIC ASSESSMEN REPORT

AFGRI Poultry (Pty) Ltd

Basic Assessment Process

Locality: Sundra

Departmental Ref No: 17/2/3 N-242

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PROJECT DETAILS

Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET)

Reference No.: 17/2/3 N-242

Project Title: AFGRI Poultry Composting Site

Project Number: AFG-DEL-12-11-16

Compiled by: Lourens de Villiers

Date: 28 November 2013

Location: Pretoria

Technical Reviewer: Mr. Lourens de Villiers

Signature

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www.weathersa.com

DEFINITIONS

Contaminated

The presence in or under any land, site, buildings or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which substance or micro-organism directly or indirectly affects or may affect the quality of soil or the environment adversely.

Environment

The surroundings (biophysical, social and economic) within which humans exist and that are made up of

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Aspects

Elements of an organisation's activities, products or services that can interact with the environment.

Environmental Degradation

Refers to pollution, disturbance, resource depletion, loss of biodiversity, and other kinds of environmental damage; usually refers to damage occurring accidentally or intentionally as a result of human activities.

Environmental Impacts

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

Environmental Impact Assessment

A study of the environmental consequences of a proposed course of action.

Environmental Impact Report

A report assessing the potential significant impacts as identified during the environmental impact assessment.

Environmental impact

An environmental change caused by some human act.

General Waste

Waste that does not pose an immediate hazard or threat to health or to the environment, and includes—
(a) domestic waste;
(b) building and demolition waste;
(c) business waste: and
(d) inert waste.

Hazardous waste

Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Land use

The various ways in which land may be employed or occupied. Planners compile, classify, study and analyse land use data for many purposes, including the identification of trends, the forecasting of space and infrastructure requirements, the provision of adequate land area for necessary types of land use, and the development or revision of comprehensive plans and land use regulations.

Pollution

Any change in the environment caused by—
(i) substances;
(ii) radioactive or other waves; or
(iii) noise, odours, dust or heat.
emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and

productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Pollution Prevention

Any activity that reduces or eliminates pollutants prior to recycling, treatment, control or disposal.

Public Participation Process

A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.

Storage

The accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

Topography

Topography, a term in geography, refers to the "lay of the land" or the physio-geographic characteristics of land in terms of elevation, slope and orientation.

Treatment

Any method, technique or process that is designed to—
(a) change the physical, biological or chemical character or composition of a waste; or
(b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
(c) destroy or reduce the toxicity of a waste,
in order to minimise the impact of the waste on the environment prior to further use or disposal.

Vegetation

All of the plants growing in and characterising a specific area or region; the combination of different plant communities found there.

Waste

Any substance, whether or not that substance can be reduced, re-used, recycled and recovered—
(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
(b) which the generator has no further use of for the purposes of production;
(c) that must be treated or disposed of; or
(d) that is identified as a waste by the Minister by notice in the *Gazette*,

and includes waste generated by the mining, medical or other sector, but—
(i) a by-product is not considered waste; and
(ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

Water Resource

- a river or a spring;
- a natural channel in which water flows regularly or intermittently;
- a wetland, lake or dam into which, or from which, water flows;
- any collection of water which the Minister may declare to be a watercourse; and
- surface water, estuaries and aquifers (underground water).

All water bodies in the hydrological cycle, including underground water, are regarded as water resources.

Water Course

- a river or spring;
- a natural channel or depression in which water flows regularly or intermittently;
- a wetland, lake or dam into which, or from which water flows; and
- any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998).

Water Use

Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

Wastewater

Wastewater is water containing waste, or water that has been in contact with waste material.

- Wastewater includes
  - domestic wastewater
  - biodegradable industrial wastewater
  - industrial wastewater.

Wetland

Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

ABBREVIATIONS

BID	-	Background Information Document
BAR	-	Basic Assessment Report
CRR	-	Comments Response Report
MPDEDET	-	Mpumalanga Department of Economic Development, Environment and Tourism, Mpumalanga
DWA	-	Department of Water Affairs
EAP	-	Environmental Assessment Practitioner
ECA	-	Environmental Conservation Act of 1989
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Programme
GN	-	Government Notice
I&AP	-	Interested and Affected Party
NEMA	-	National Environmental Management Act, Act 107 of 1998 as amended
R	-	Regulation

EXECUTIVE SUMMARY

The Applicant

AFGRI Poultry (Pty) Ltd. forms part of AFGRI Operations Limited and is an integral supplier of chicken in South Africa. Day-old chicks are raised in AFGRI- and contractor- owner broiler farms and are supplied to AFGRI's abattoirs when fully grown. One of these abattoirs is the Daybreak abattoir in Sundra, Mpumalanga.

Background description

The AFGRI Poultry Daybreak abattoir is located on the remaining extent of portion 8 of the farm Modderfontein 236 IR. The abattoir currently slaughters approximately 700 000 chickens per week and an expansion of the abattoir to 1 500 000 chickens per week is planned for the future. Wastewater generated by the slaughtering process has a high content of suspended fats. Currently the wastewater is partially treated and discharged into a pan (the Daybreak pan) on the property. To effectively treat the wastewater, a Waste Management License application is currently in process for the construction of a wastewater treatment works on the property. With the future construction of the wastewater treatment works, pollution of the Daybreak pan will cease. However, the wastewater treatment works cannot treat the fats dissolved in the wastewater. To eliminate this problem, the dissolved fats are removed prior to treatment of the wastewater in a Dissolved Air Flocculation system. Currently, these fats (hazardous waste) need to be disposed of at a hazardous landfill site at great costs to AFGRI. To effectively treat the fats so that they are no longer seen as hazardous waste, a composting site is being proposed. An added benefit of composting is that other waste streams, including chicken litter from AFGRI's broiler farms, chicken manure, chicken mortalities, Dead-on-arrival chickens, abattoir floor waste and sludge, can also be treated into a valuable resource, namely compost.

Project description

AFGRI Poultry wishes to establish a composting site on a disturbed area (crop fields) of their property to compost their poultry waste. The following poultry wastes will be composted:

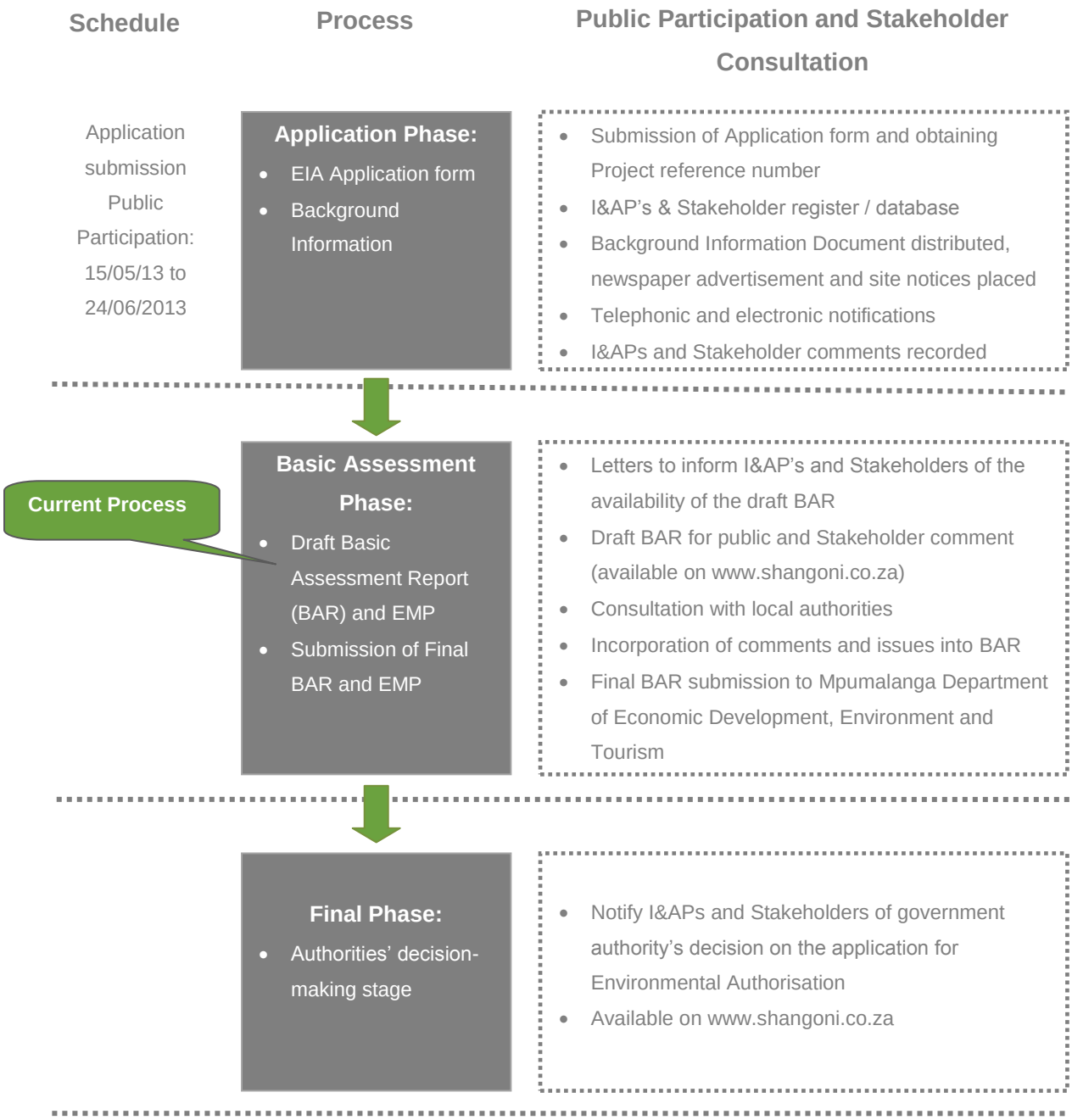
- Chicken manure;
- Chicken mortalities and Dead-On-Arrival chickens;
- Abattoir factory floor waste, sludge and fat; and
- Straw (broiler house litter).

Legal requirements and legislative process

As part of the proposed project, listed activities defined under the National Environmental Management Act, Act No. 107 of 1998 (NEMA, 1998) and the regulations there under will take place. Relevant listed activities triggered by the proposed activities are described further in this Basic Assessment Report (refer to Part 1.5).

It is the intention of this Basic Assessment Report to provide the Mpumalanga Department of Economic Development, Environment and Tourism with the necessary information relating to the activities associated with the proposed project, as required in terms of the National Environmental Management Act (NEMA), as amended, Regulation 28 of the Environmental Impact Assessment Regulations, 2010. This report intends to highlight all information relevant to the proposed composting site project.

The diagram below provides a visual representation of the Basic Environmental Impact Assessment process being conducted in terms of NEMA, 1998 and the Environmental Impact Assessment Regulations, dated 2010.


Schedule
Process
Public Participation and Stakeholder Consultation
Application submission Public Participation: 15/05/13 to 24/06/2013
Application Phase:
EIA Application form
Background Information
Submission of Application form and obtaining Project reference number
I&AP's & Stakeholder register / database
Background Information Document distributed, newspaper advertisement and site notices placed
Telephonic and electronic notifications
I&APs and Stakeholder comments recorded
Current Process
Basic Assessment Phase:
Draft Basic Assessment Report (BAR) and EMP
Submission of Final BAR and EMP
Letters to inform I&AP's and Stakeholders of the availability of the draft BAR
Draft BAR for public and Stakeholder comment (available on www.shangoni.co.za)
Consultation with local authorities
Incorporation of comments and issues into BAR
Final BAR submission to Mpumalanga Department of Economic Development, Environment and Tourism
Final Phase:
Authorities' decision-making stage
Notify I&APs and Stakeholders of government authority's decision on the application for Environmental Authorisation
Available on www.shangoni.co.za

Identified impacts

For the purpose of the Basic Assessment report, it is required by Regulation 22(2)(i) of Regulation 543) of the EIA Regulations dated 2010, under the NEMA, 1998 that a description and assessment be given of the significance of any environmental impacts. This must include an assessment of the nature/status; extent; duration; probability; reversibility; replaceability of resources; and mitigatory potential of the environmental impacts of the proposed project be undertaken, as well as an assessment of any cumulative impacts.

The activities associated with the proposed project are described in detail in Section 2. The following main impacts have been identified and assessed during this basic assessment process:

- Eutrophication of the adjacent surface water body (Daybreak Pan);
- Salination of adjacent surface water body (Daybreak Pan);
- Generation of odour from the storage of organic matter and composting processes;
- Groundwater contamination from compost leachate.

Detailed assessments (risk assessment) of all potential impacts of the proposed project are given in Section 7.

This draft Basic Assessment Report forms part of an application for environmental authorisation for the AFGRI Poultry Composting Site project at the remaining extent of portion 8 of the farm Modderfontein 236 IR, Mpumalanga. The application is made in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The application process is undertaken on behalf of the applicant, AFGRI Poultry (Pty) Ltd., by Shangoni Management Services (Pty) Ltd. Shangoni was appointed as independent environmental practitioner, to assist the applicant in undertaking the process as prescribed in the above-mentioned environmental legislation.

An application for environmental authorisation was submitted to the identified competent authority, the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET). The Department subsequently registered the project and the formal Basic Assessment process was thereby initiated. All the findings from the draft Basic Assessment process are included in this report.

This draft Basic Assessment Report is divided into the following parts:

- Section 1: Introduction (including a description of the project).
- Section 2: Nature and extent of the environment affected by activity.
- Section 3: Applicable legislation and guidelines.
- Section 4: Public Participation Process.
- Section 5: Need and desirability for the project.
- Section 6: Description of alternatives.
- Section 7: Environmental Impact Assessment.
- Section 8: Environmental Impact Statement.
- Section 9: Conclusion.

1.1 Process followed

1.1.1 The Basic Assessment Report in terms of the requirements of NEMA, 1998

Regulation 22 of the EIA Regulations, 2010, under the NEMA, 1998, lists aspects that must be included in all Basic Assessment Reports. The table below indicates the relevant sections where information has been provided as part of this Basic Assessment Report:

Table 1: The Basic Assessment Report in terms of the EIA Regulations, 2010, under the NEMA, 1998

Regulation No:		Description	BAR Part
R543 Regulation 22(2)(a)		Details of the Environmental Assessment Practitioner (EAP).	Part 1 & Appendix F
	(i)	Details of the EAP who prepared the report.	
	(ii)	Details of the expertise of the EAP to carry out the	

Regulation No:		Description	BAR Part
		basic assessment procedures.	
R543 Regulation 22(2)(b)		A description of the proposed activity.	Part 1
R543 Regulation 22(2)(c)		A description and map of the property on which the activity is to be undertaken and the location of the activity on the property.	Part 1
R543 Regulation 22(2)(d)		A description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.	Part 2
R543 Regulation 22(2)(e)		Identification of all legislation and guidelines that have been considered in the preparation of the basic assessment report.	Part 3
R543 Regulation 22(2)(f)		Details of the public participation process conducted:	Part 4 & Appendix E
	(i)	Steps taken to notify potential interested and affected parties of the proposed application.	
	(ii)	Proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given.	
	(iii)	List of all persons, organisations and organs of state that were registered as interested and affected parties in relation to the application.	
	(iv)	A summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those issues.	
R543 Regulation 22(2)(g)		A description of the need and desirability of the proposed activity.	Part 5
R543 Regulation 22(2)(h)		A description of identified potential alternatives to the proposed activity that area feasible and reasonable, including advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity.	Part 6, 7 & 8
R543 Regulation 22(2)(i)		A description and assessment of each identified significant impact, including:	Part 7
	(i)	Cumulative impacts.	
	(ii)	The nature of the impact.	
	(iii)	The extent and duration of the impact.	
	(iv)	The probability of the impact occurring.	

Regulation No:		Description	BAR Part
	(v)	The degree to which the impact can be reversed.	
	(vi)	The degree to which the impact may cause irreplaceable loss of resources.	
	(vii)	The degree to which the impact can be mitigated.	
R543 Regulation 22(2)(j)		Any environmental management and mitigation measures proposed by the EAP.	Part 7 and EMP
R543 Regulation 22(2)(k)		Any inputs and recommendations made by specialists to the extent that may be necessary.	Part 2 & 7
R543 Regulation 22(2)(l)		A draft environmental management programme containing the aspects contemplated in Regulation 33 of the EIA Regulations, 2010.	Addendum B
R543 Regulation 22(2)(m)		A description of any assumptions, uncertainties and gaps in knowledge	Part 9 (if applicable)
R543 Regulation 22(2)(n)		A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Part 9
R543 Regulation 22(2)(o)		Representations and comments received in connection with the application or the basic assessment report.	Part 4 & Appendix E
R543 Regulation 22(2)(p)		Minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants.	Part 4 & Appendix E (if applicable)
R543 Regulation 22(2)(q)		Any responses by the EAP to those representations, comments and views.	Part 4 & Appendix E
R543 Regulation 22(2)(r)		Any specific information that may be required by the competent authority.	Not currently applicable
R543 Regulation 22(2)(s)		Any other matters required in terms of sections 24(4)(a) and (b) of the Act.	Not currently applicable

1.2 Applicant

Name of Applicant	AFGRI Poultry (Pty) Ltd.
Contact Person	Mr. Willem Breedt
Postal Address	PO Box 186 Sundra 2200
Telephone No.	013 661 1063
Fax No.	013 661 1797

Farm name and portion on which the activities take place	Remaining extent of portion 8 of the farm Modderfontein 236 IR, Mpumalanga
Title Deed Number and 21 Digit Code	T13522/2012; T0IR00000000023600008
Co-ordinates of operation	26° 9'19.83"S; 28°32'10.14"E

1.3 Appointed Environmental Assessment Practitioner

Name of firm	Shangoni Management Services (Pty) Ltd.	
Postal address	PO Box 74726 Lynwood Ridge Pretoria 0040	
Telephone No.	012 807 7036	
Fax	012 807 1014/086 643 5360	
E-mail	lizette@shangoni.co.za	
Team of Environmental Assessment Practitioners on project		
Name	**Qualifications & experience to conduct the EIA**	**Responsibility**
Mr. H.L. de Villiers	• Bsc. (Hons) (PU for CHE) MSc.(UP) • More than 10 years' experience conducting Environmental Impact Assessments and Waste Management License Applications	EIA Project Leader and Co-ordinator
Ms. Lizette Crous	• Post Graduate Certificate Environmental Management (University of London) • More than 2 years' experience conducting Environmental Impact Assessments and Waste Management License Applications	EAP

* Detailed CVs for the project team are appended (Appendix F)

Lourens de Villiers – Project Director

Lourens holds a M.Sc. Water Resource Management degree from the University of Pretoria and has ten years' experience in the environmental field. He specializes in compilation and management of Environmental Impact Assessments (EIA's) for commercial, industrial, agri-industrial, mining and residential developments. Lourens is also actively involved in third party ISO 14001 certification audits in the mining and industrial sectors.

Lizette Crous – Environmental Practitioner

Lizette obtained a B.Sc. degree specialising in Biodiversity and Ecology from the University of Stellenbosch. She is currently completing a M.Sc. in Environmental Management at the University of London and is responsible for Waste Management License Applications and non-mining Environmental Impact Assessments (EIA) at Shangoni.

1.4 Current situation

The current waste management challenges relating to day-to-day abattoir operations necessitated the abattoir management staff to come up with better alternatives in order to deal with the pressing issue of waste management optimization. It is anticipated that waste stream volumes and the associated pressures related to them will increase exponentially over time as the planned expansions to the facility start to transpire.

Currently waste streams associated with the abattoir facility include both general as well as hazardous wastes with some being recyclable and other non-recyclable.

One of the waste streams that went through vigorous scrutiny over the past couple of years was the abattoir effluent stream that did not meet disposal requirements and had to go through an extensive EIA, waste licensing as well as water use licensing process to propose a better alternative that would be introduced in the form of a ponded sewage treatment process.

Currently part of the effluent stream, namely suspended fats get removed from the rest of the effluent stream by a dissolved air floatation (DAF) process. The collected fats are piped from the DAF plant into waste skips from where it used to go to an animals by-products plant (AFGRI rendering facility). At the rendering plant the fat was used within the animal feed production process. However it was decided by the Rendering production staff that the fat will no longer be utilized within their production process and another disposal alternative had to be found by the abattoir management. The decision was subsequently taken to dispose of the fat at the Holfontein hazardous waste site.

This disposal alternative is not sustainable over the long term as it is extremely expensive and does not conform to the ideology of the National Waste Management Strategy of 2012 that promotes waste disposal only as a last resort for waste generators.

Another issue that is currently under investigation is the fact that the collected fat is treated as a hazardous waste stream.

The reason why the fat is currently regarded as a hazardous waste is because of its organic composition and the possibility that it might carry and distribute pathogens and harmful bacteria, if not

disposed of or treated in a proper manner and within an acceptable space of time.

With the promulgation of the Waste Classification and Management Regulations on the 23rd of August 2013, guidance was given towards correct waste classification methodology. It is possible that the current hazard rating of the fat-sludge might be incorrect and that the waste stream can actually be de-classified as a hazardous waste and re-classified as general waste. It is therefore the intention of AFGRI poultry to classify the waste stream as soon as possible in order to shed light on the issue.

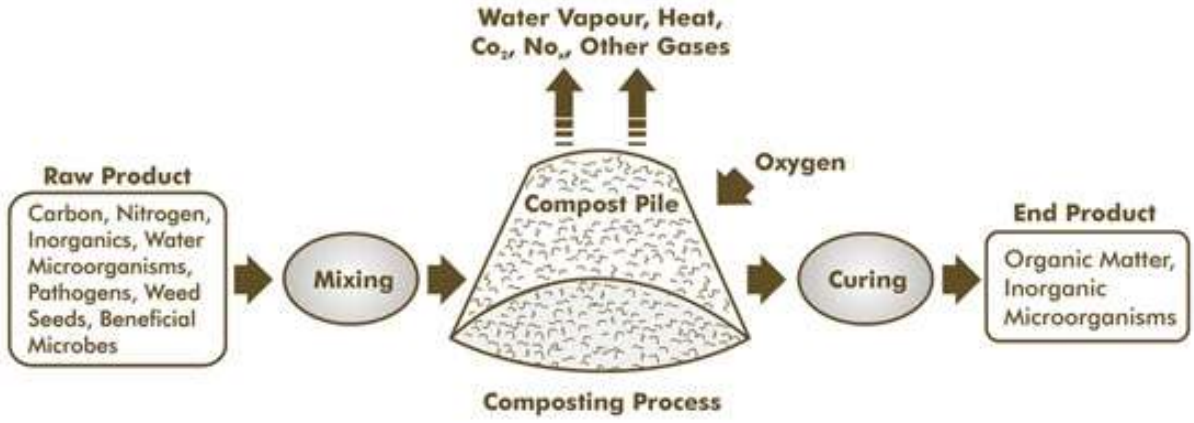
1.5 Proposed activity

All considered, its was decided that the best sustainable alternative to deal with this waste stream would be to put it through a composting process where potential pathogens are eliminated, and where the nutrients within the fat can be broken down into nutrients available for plant absorption when applied as a organic fertilizer.

The fat will however not be composted by itself, but will for part of a number of ingredients added together to create the optimal composting mixture.

More detail pertaining to the composting process are provided within this report under 1.5.3 Process Method and Design, but in principle it would involve the combination of poultry broiler litter generated by AFGRI owned poultry broiler farms in close proximity to the abattoir with the fat generated by the DAF plant.

Composting is a simple, natural process to produce a marketable product. Compost, when properly produced is a uniform, stable, odorless, soil-like product. The objective of composting is to encourage the growth of the naturally occurring, aerobic (oxygen-requiring) microorganisms in the composted medium. In the presence of oxygen and water**,** microorganisms feed on the organic matter within the medium. Some of the organic compounds in the litter are broken down into nutrients and become part of the growing microorganisms. When the microorganisms die, the nutrients are recycled again. Composting changes the physical and chemical characteristics of the original organic material. The more resistant organic compounds remain and combine with the microorganisms to form a humus-like material called compost.



This process is supposed to be a controlled activity and requires authorization from the regulatory authority dealing with waste permitting/licensing.

In terms of the National Environmental Management: Waste Act (Act 59 of 2008), the following listed activities needs to be authorized.

Table 2: Listed activities in terms of Government Notice R. 544 of 18 June 2010

Number and date of the relevant notice	Activity No	Description
Government Gazette No. 33306 of 18 June 2010; No. R 544 (Listing Notice 1)	11	The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
Government Gazette No. 33306 of 18 June 2010; No. R 544	23	The transformation of undeveloped, vacant or derelict land to – (i) residential, retail, commercial, recreational, industrial or

(Listing Notice 1)		institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - except where such transformation takes place – (i) for linear activities; or (ii) for purposes of agriculture or afforestation, in which case Activity 16 of Notice No. R. 545 applies.

1.5.1 Proposed locality

The proposed site for the composting facility is located on the remaining extent of portion 8 of the farm Modderfontein 236 IR, on the periphery of Sundra, Mpumalanga.

The proposed site is situated within the Victor Khanye Local Municipalities' jurisdiction. This local municipality forms part of the Nkangala District Municipality, located within the Mpumalanga province.

Table 3: Administrative and water management boundaries

Province	Mpumalanga
District Municipality	Nkangala District Municipality
Local Municipality	Victor Khanye Local Municipality
Ward	8
Quaternary Catchment Zone	B20B and C21D

Table 4: Direction & distance to the nearest town(s)

Closest towns	Distance from site	Direction from site
Sundra AH	Less than 20m (the site is across the road from the periphery of Sundra AH)	East
Centre of Rietkol AH	1.2km	North-east
Centre of Delmas	14 km	East

The site locality map is given below as Figure 2 and is also attached in Appendix A. Site photographs are also provided below (refer to Figure 5 to 12).

1.5.2 Land tenure and use of immediately adjacent land

Land use surrounding the site includes agricultural land

Details of adjacent land owners of the proposed composting site are listed in the table below. Refer also to Section 4 for more detail regarding the Public Participation Process.

Table 5: Details of adjacent land owners to the site

Property owner	Address or property description
Ronél Risseeuw	108 Modderfontein Road, Rietkol AH
Mr. J. P. du Plessis	112 Modderfontein Road, Rietkol AH
K. Noeth	114 Modderfontein Road, Rietkol AH
Mr. Tony Rovani	383 Modderfontein Road, Rietkol AH
Johanna van Zyl	c/o Modderfontein and Main Road, Sundra
Mr. Johan Ferreira	120 Modderfontein Road, Rietkol AH
Mr. Marius Snyman	122 Modderfontein Road, Rietkol AH
Enviroserv - Holfontein	Portion 23/24 of the farm Holfontein
Unknown	86 Modderfontein Road, Rietkol AH
Mr. Jan Swanepoel	Corner of Modderfontein Road and 8th Street
Susan Muller	Portion 36 of the farm Modderfontein 236 IR
Mr. Daan Duvenaghe	Portion 10 of the farm Modderfontein 236 IR
S.M. van Dyk	Portion 7 & 35 of the farm Modderfontein 236 IR
W.D. Emmett	379 Modderfontein Road, Rietkol AH
Elizabeth Smith	369 Modderfontein Road, Rietkol AH

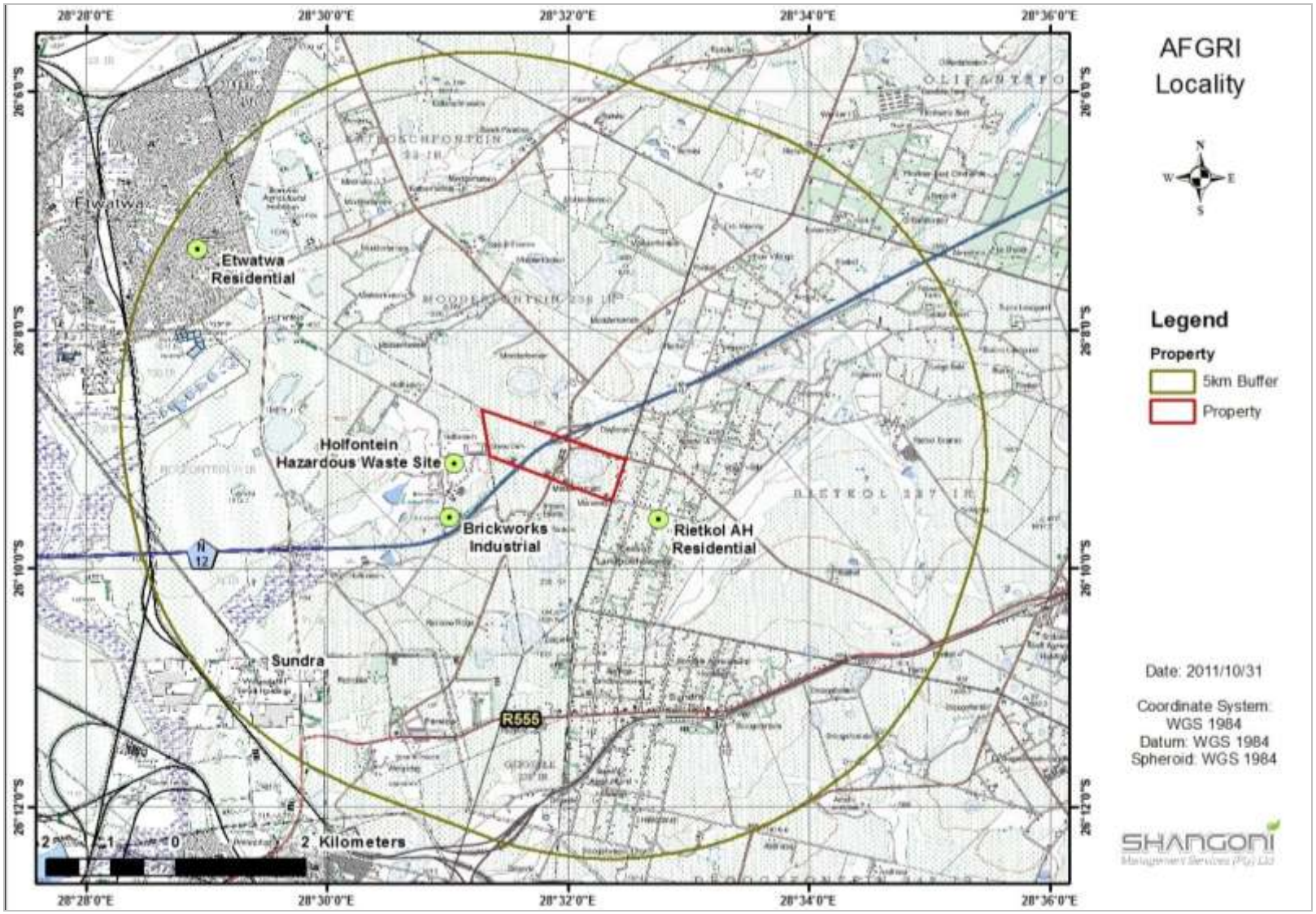


Figure 1: Site locality map

Figure 2: Google Earth image of the site

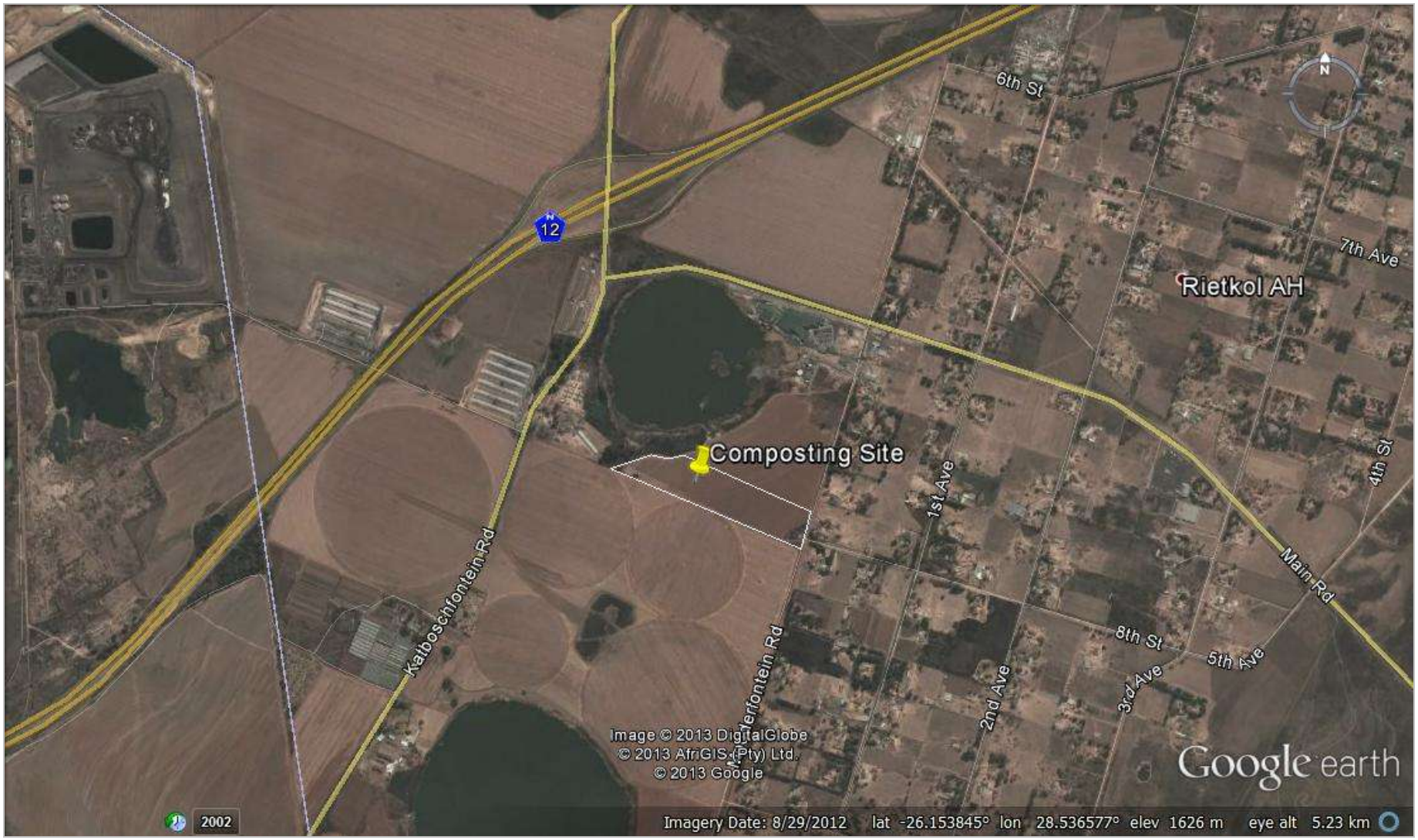


Figure 3: Google Earth image of the site and surrounding area

Figure 4: Site photograph 1

Figure 5: Site photograph 2

Figure 6: Site photograph 3

Figure 7: Site photograph 4

Figure 8: Site photograph 5

Figure 9: Site photograph 6

Figure 10: Site photograph 7

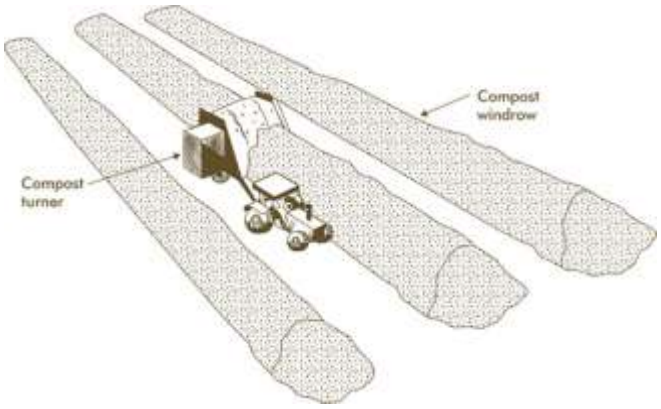
Figure 11: Site photograph 8

1.5.3 Process Method and Design

The proposed process for composting will be the method of windrow composting whereby the composted material are received and separately stored in stockpiles. The materials are then mixed according to the correct ratio as determined prior to production.

The mixed material are placed in long windrows (50m-250m) X 4m wide X 2m high, that are agitated or turned on a regular basis throughout the process.

The optimum height and width of these windrows will depend on the type of equipment used to turn them. Windrows can either be turned using bucket loaders or specialty windrow-turning machines, however at present the specific equipment to be used are not yet established.



The frequency of the windrow turning will depend on factors such as the type of materials being composted and the porosity of the windrow. Based on the proposed type of material to be used it is envisaged that the windrows will be aerated on a weekly to two-week cycle depending on the temperature and moisture conditions in the compost at a given time. The compost production process will take approximately 3 to 4 months to completion.

As basic good practice it is important that the following are effectively applied and managed:

- The nitrogen to carbon ratio of the compost mixture should be kept at 25 to 30:1;
- The moisture content should be maintained at around 50 % through controlled watering and aeration of the windrows;
- The temperature be kept at around 50-60^{0}C;
- Porosity 30-36;
- Aeration of >5%; and
- A pH level of 6,5 to 7,5.

Mismanagement can result in poor quality compost being produced that may be odorous and even harmful to plants when used as fertilizer.

2. NATURE AND EXTENT OF THE ENVIRONMENT AFFECTED BY ACTIVITY

The following section provides a description of the baseline or status quo environment as well as the social-economic parameters that characterise the region and the study area, and is derived from various specialist studies as well as data sources including aerial photographs, topo-cadastral maps and national and provincial databases.

2.1 Geology

The AFGRI Daybreak abattoir is situated in the Vryheid Formation (Pv) which consists mainly of mudrock, rhythmite, siltstone and fine- to coarse-grained sandstone (pebbly in places). The Vryheid Formation overlies the Malmani subgroup which consists mainly of dolomite (Scholtz O., 2012).

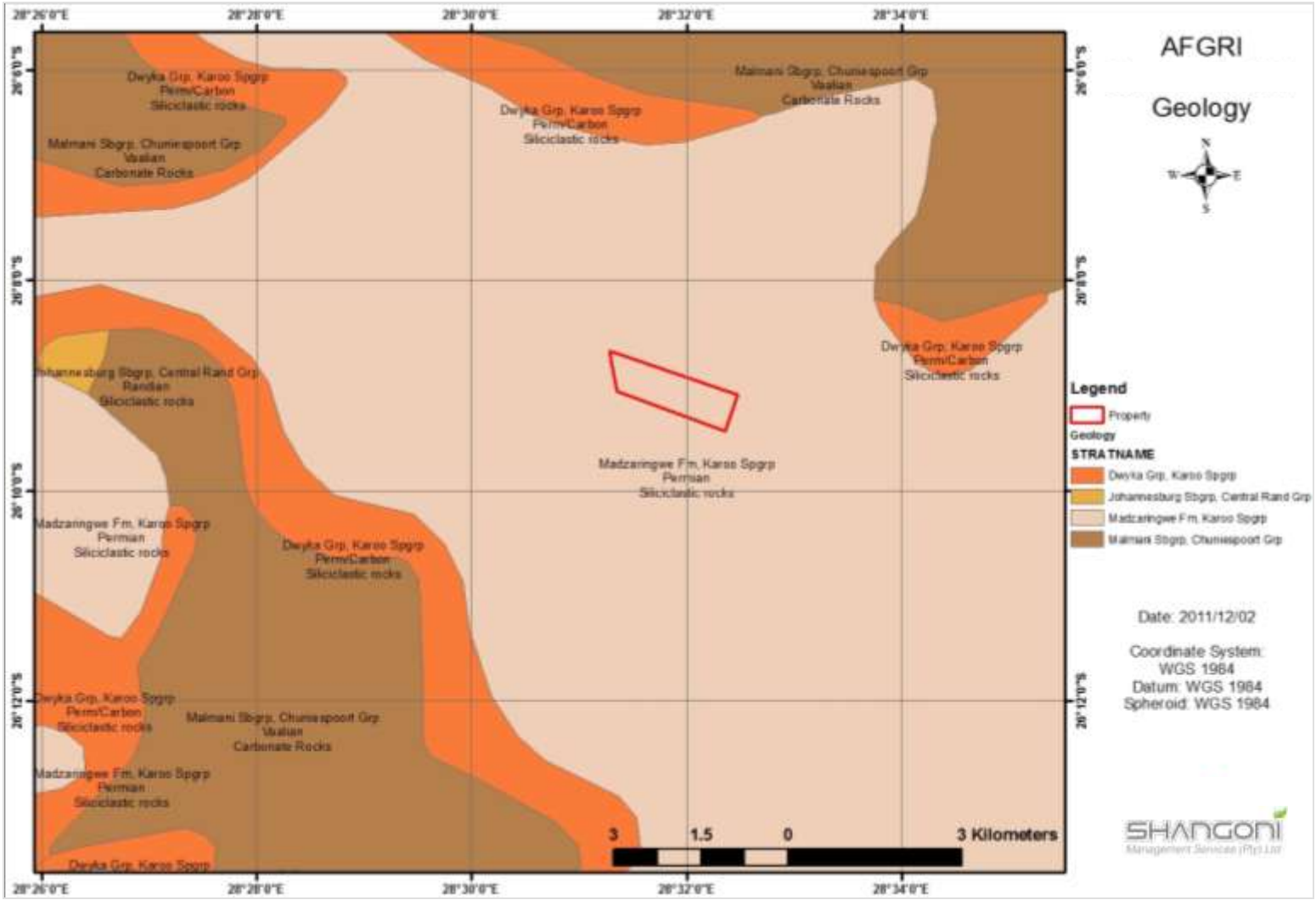


Figure 12: Geology of the site

2.2 Regional Climate

The climate of the site is typical of Highveld conditions, with relatively warm to hot summers and fairly high rainfall, and moderate to cool winters with little or no rain. Valleys and wetlands are much cooler at night and more prone to frost than higher lying areas. The area experiences thunderstorms during the summer months, which usually occur in the late afternoons.

Rainfall

The site occurs in a summer rainfall area receiving a mean average annual rainfall of between 601 to 800mm (AGIS, 2007).

The average monthly rainfall (Figure 14) for the area was obtained from the Delmas weather station, as provided by www.weathersa.com. The average annual rainfall for Delmas was also obtained from www.weathersa.com (Figure 15).

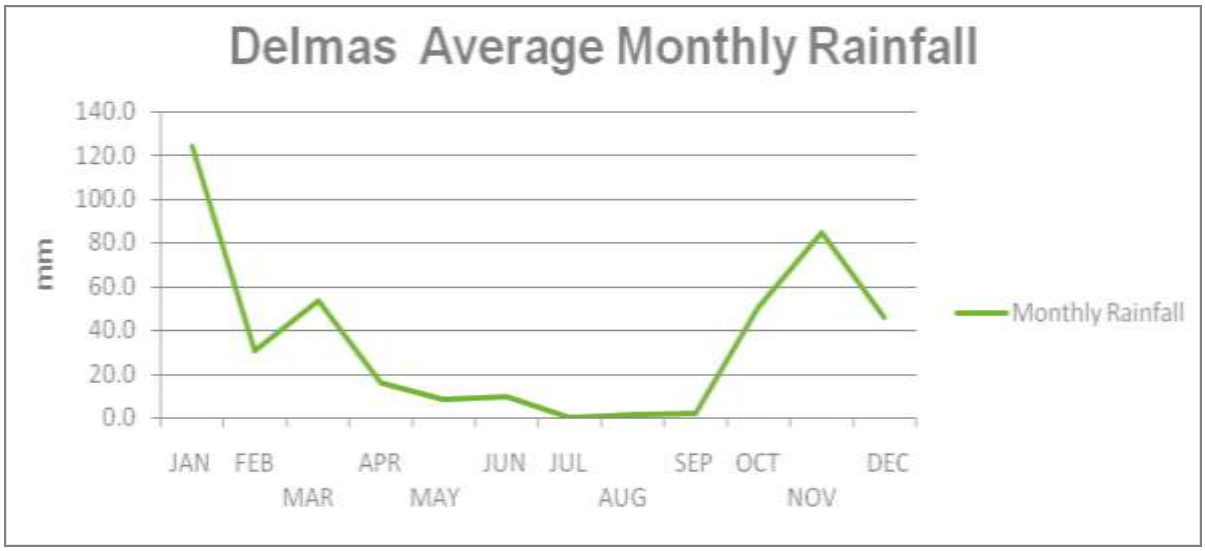


Figure 13: Delmas Average Monthly Rainfall

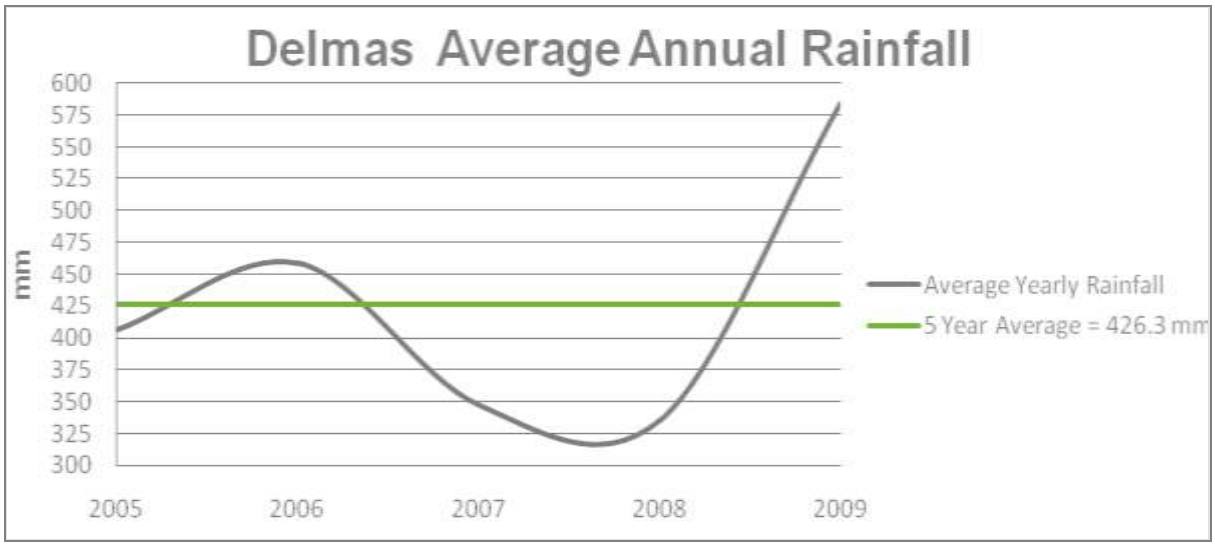


Figure 14: Delmas Average Annual Rainfall.

Temperature

The average mean maximum temperature of the Victor Khanye Municipal area ranges between 25°C and 29°C, with a mean minimal temperature ranging between 1.9°C and 2.0°C. The occurrence of frost during winter months results in the grasslands being very dry. This contributes to veldt fires.

In order to obtain a more accurate representation of the temperatures at the site, average daily temperatures were obtained from the Delmas weather station (www.weathersa.com). From the figure below it can be seen that during summer months, the maximum daily temperatures will range between 23°C and 27°C and during winter months the maximum daily temperatures will range between 18°C and 22°C.

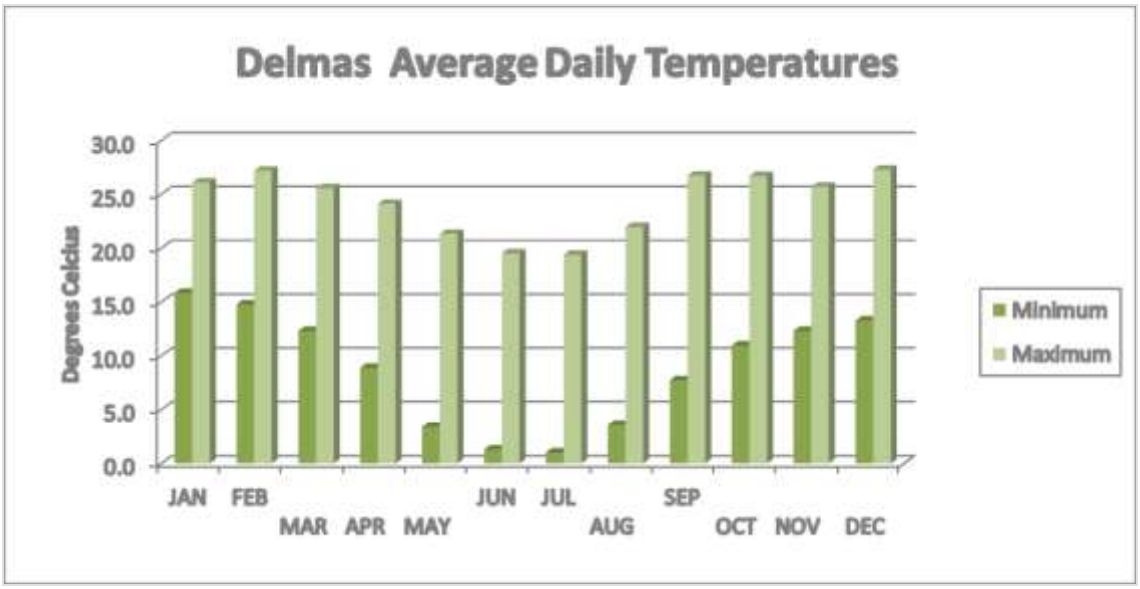


Figure 15: Maximum and Minimum Average Daily Temperatures in Delmas

Wind

The site lies approximately 14km due west from the town Delmas. The wind roses below give an indication of wind direction distributions across the Delmas area.

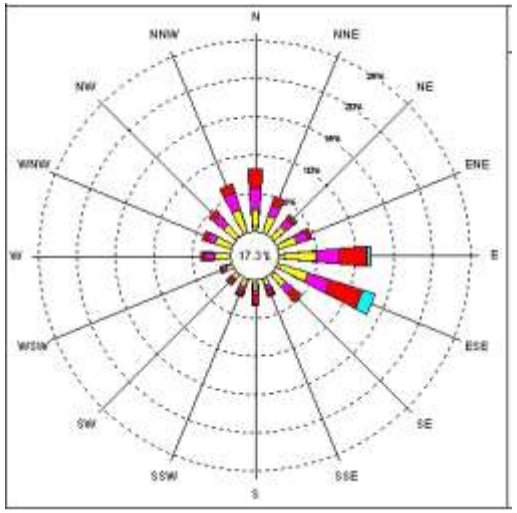


Figure 16: Wind Rose - January

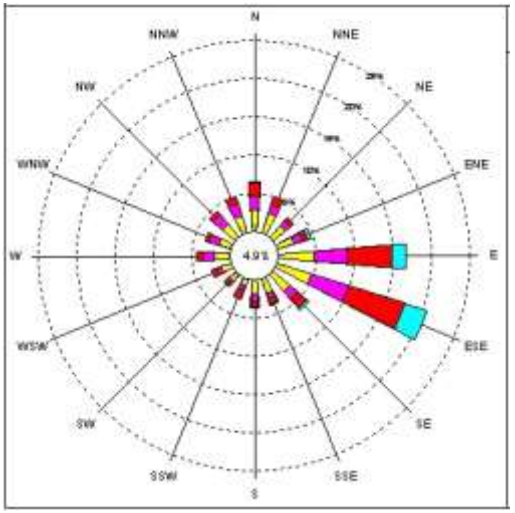


Figure 17: Wind Rose - February

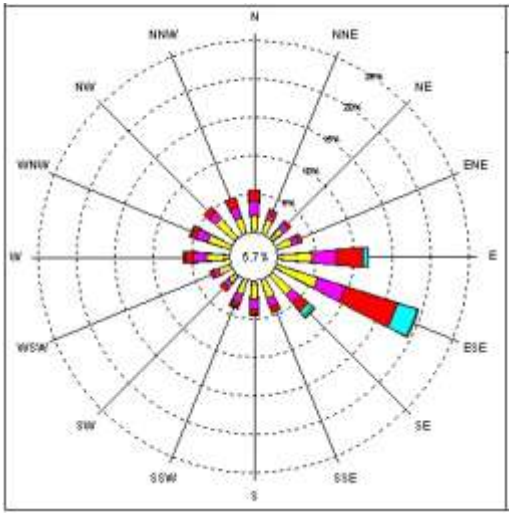


Figure 18: Wind Rose – March

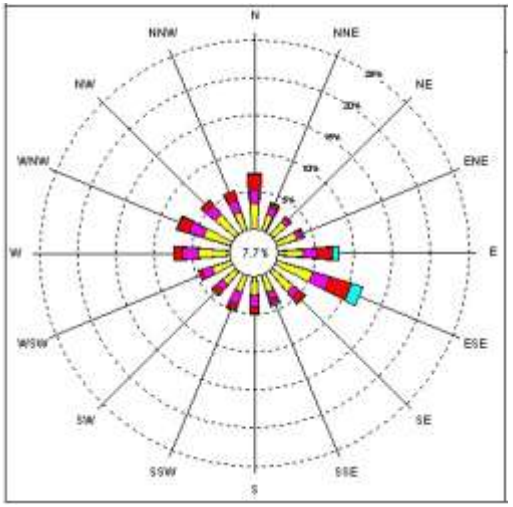


Figure 19: Wind Rose – April

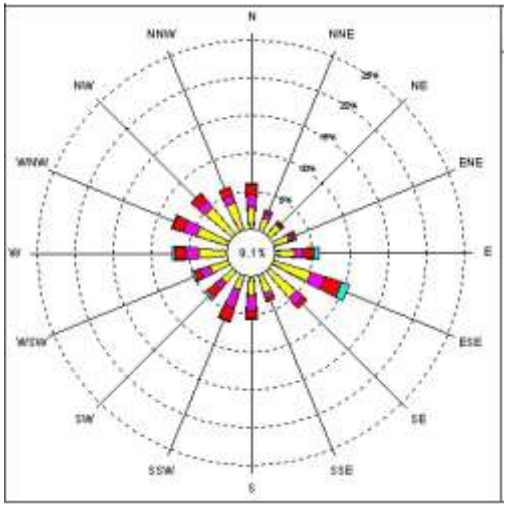


Figure 20: Wind Rose – May

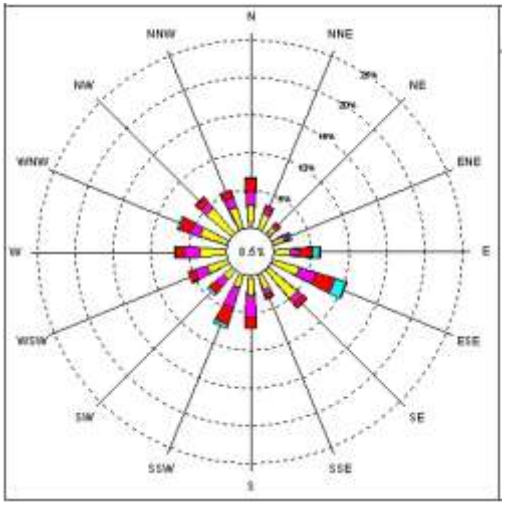


Figure 21: Wind Rose - June

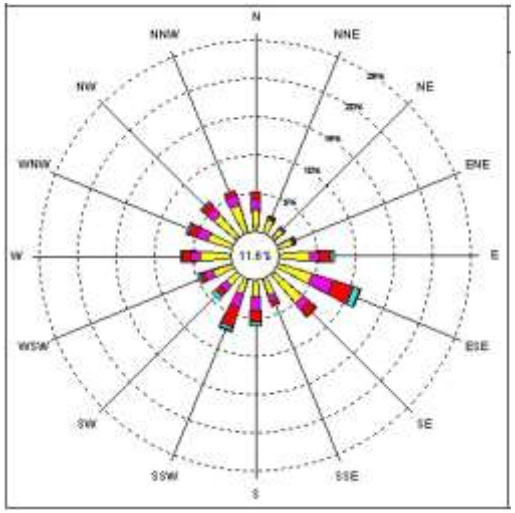


Figure 22: Wind Rose – July

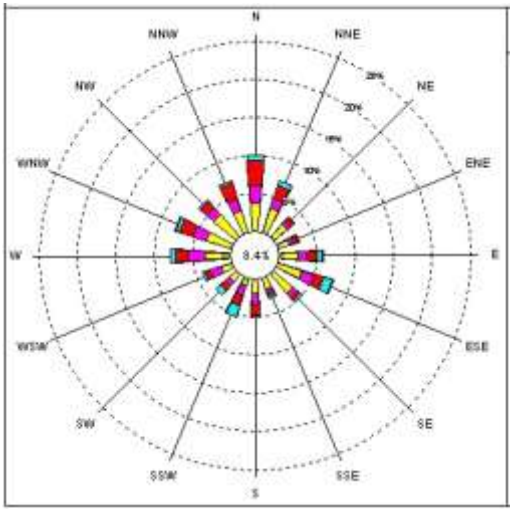


Figure 23: Wind Rose - August

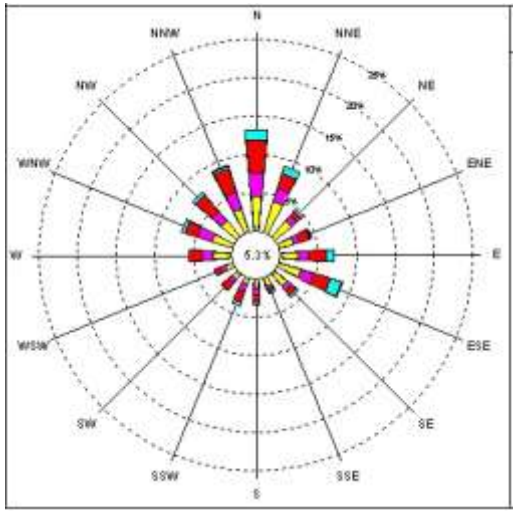


Figure 24: Wind Rose – September

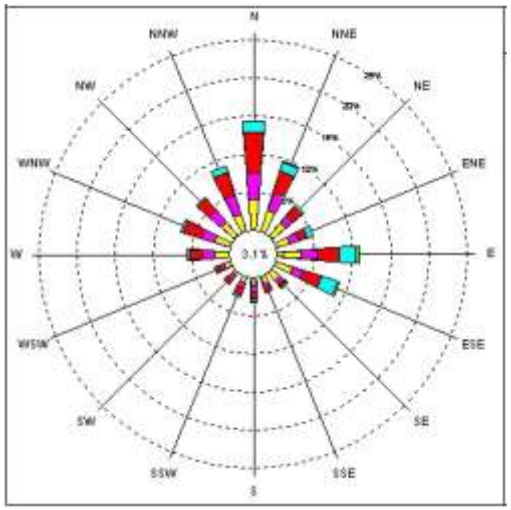


Figure 25: Wind Rose – October

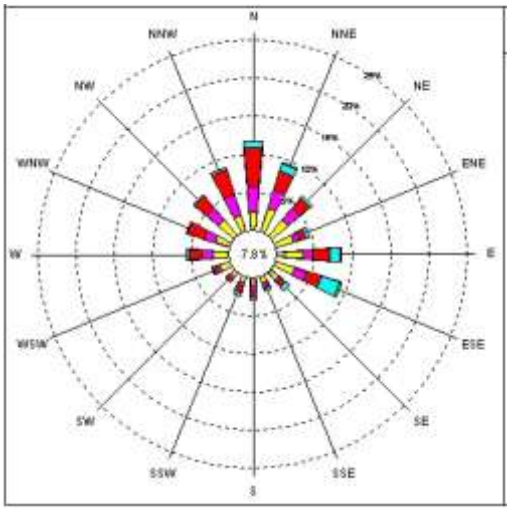


Figure 26: Wind Rose – November

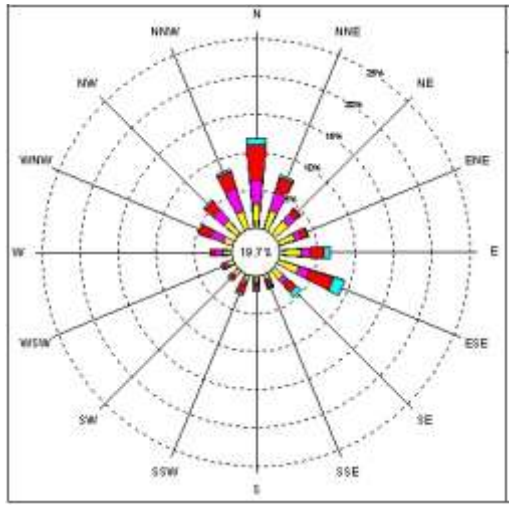


Figure 27: Wind Rose - December

2.3 Topography

The property covers a surface area of approximately 116.9 hectares. The site is located approximately 1 626 metres above mean sea level (Figure 29) and slopes towards a large pan (the Daybreak pan) located adjacent and to the north of the proposed site, at a gradient of up to 6%. The site has been used for crop production for at least the last 10 years. Areas to the north, west and south are mainly used for agriculture while to the east, across the road from the site, residential dwellings of the Rietkol Agricultural Holding are present.

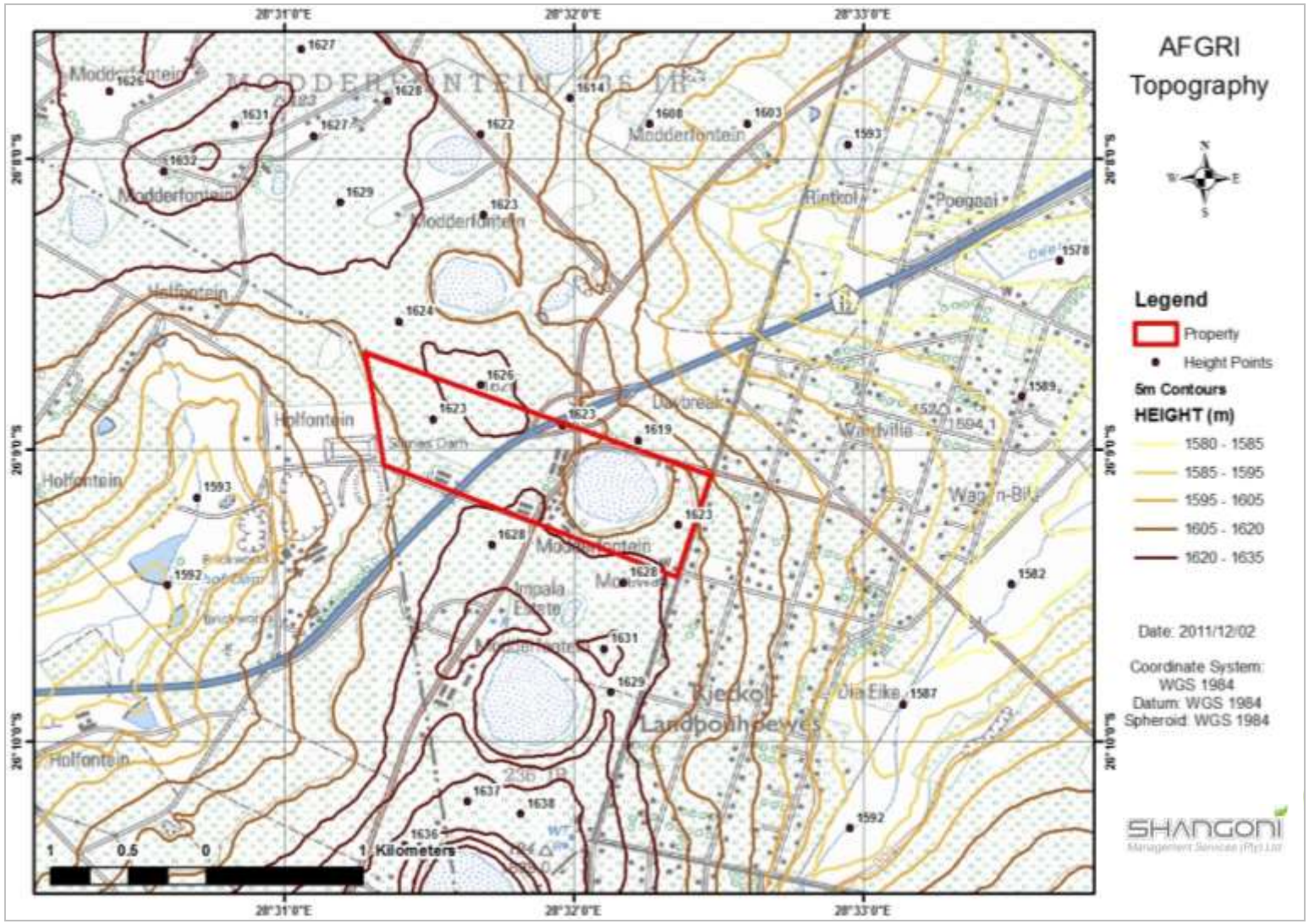


Figure 28: Topography of the site

2.4 Soils

A geotechnical investigation was carried out at the site by Johann van der Merwe in 2010. During the geotechnical investigation, the area to the east of the Daybreak pan was investigated. The southern part of this area is the proposed site for the composting facility. The study area can be divided into two prominent material zones (Soil Zones “A” and “B”). As shown in Figure 30, Soil Zone ”A” covered the lower-lying, western portion of the study area and the larger, higher-lying, eastern portion of the study area was covered by Soil Zone “B”. The proposed site comprises of soil zone A in its easternmost part and soil zone B in the remainder of the site, as shown in Figure 31. A description of both soil zones is given in the tables below.

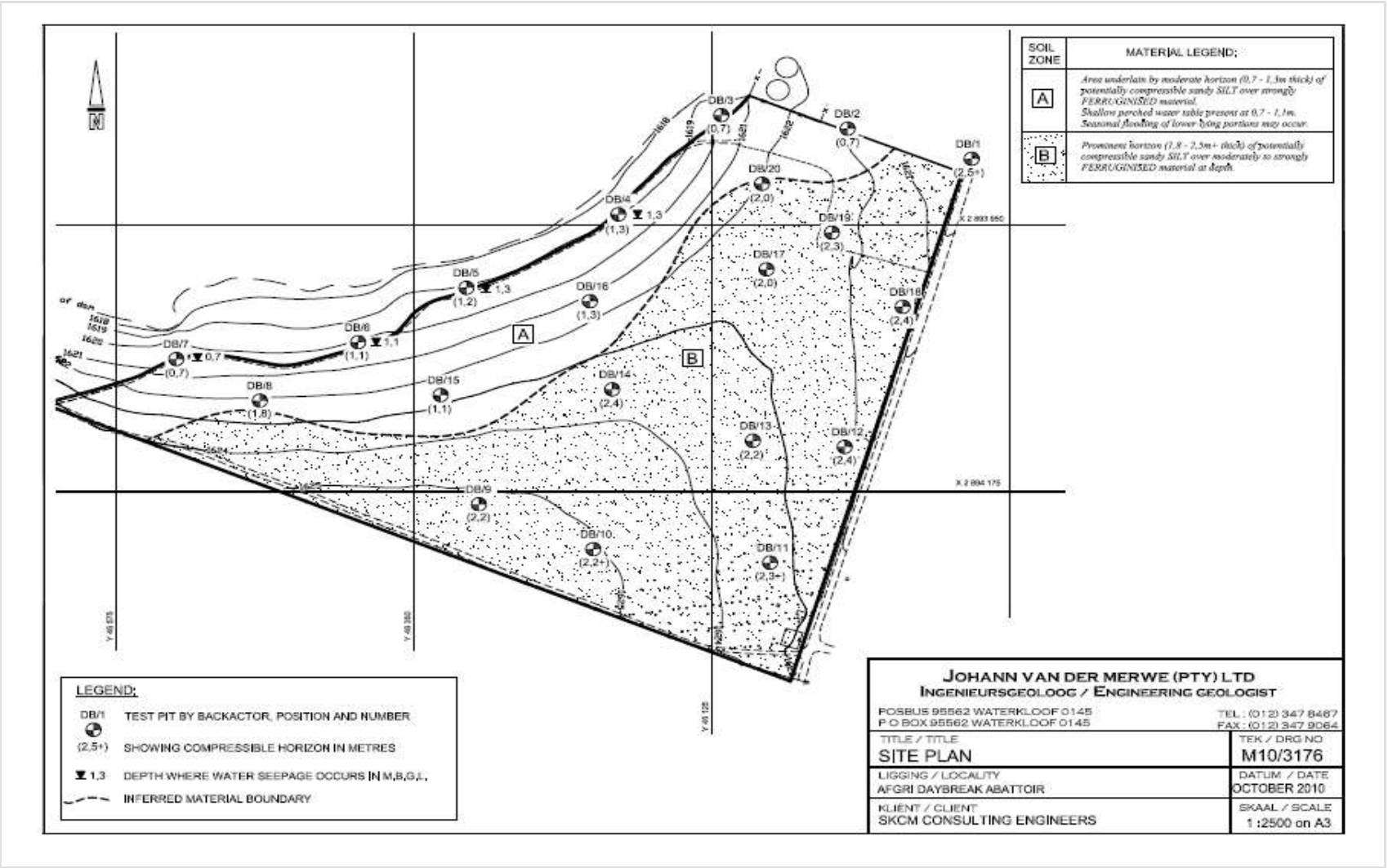


Figure 29: Location of test pits (van der Merwe, 2010)

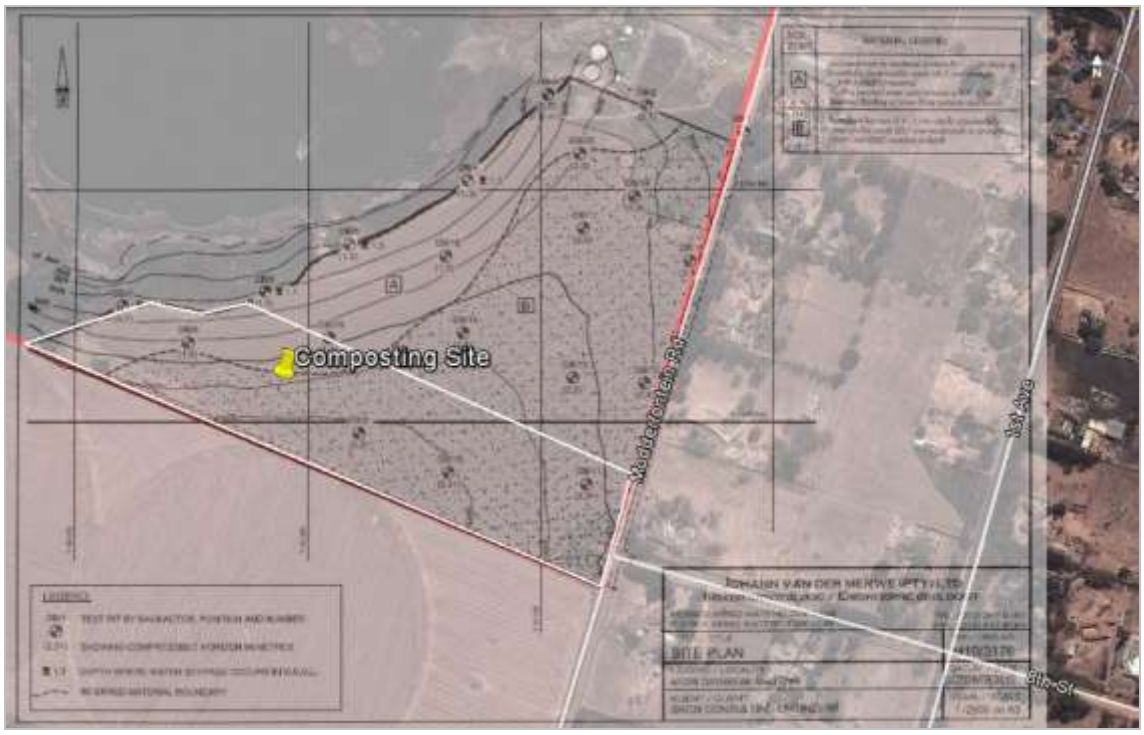


Figure 30: Overlay of soil zones on a Google image of the site

Table 6: General description of the typical soil profile of zone A.

Soil Zone A	
Depth (m)	**Description**
0,0 - 0,3	Moist, greyish brown, stiff, shattered, sandy silt containing fine roots; colluvium.
0,3 - 1,0	Moist, orange becoming dark yellow, firm becoming soft, voided, sandy silt containing soft ferruginous concretions toward the base; colluvium
0,3 - 1,0	Abundant medium and fine, hard nodular ferricrete, clast supported in a matrix of moist, dark red, sandy silt; ferruginised colluvium. Overall consistency is of medium density.
1,0 - 2,0	Moist, dark red and yellow blotched with light grey and black, partially to strongly ferruginised, clayey silt containing abundant coarse, hard nodular ferricrete; ferruginised colluvium. Overall consistency is dense becoming very dense.

Table 7: General description of the typical soil profile of zone B.

Soil Zone B	
Depth (m)	**Description**
0,0 - 0,4	Moist, reddish dark brown, stiff, shattered, sandy silt containing fine roots; colluvium.

0,4 - 2,5	Moist, dark orange red and dark red, firm becoming soft, voided, sandy silt containing soft ferruginous concretions toward the base; colluvium
2,5 - 3,0	Abundant medium and fine, hard nodular ferricrete, clast supported in a matrix of moist, dark red, sandy silt, ferruginised colluvium. Overall consistency is medium dense becoming dense with increasing depth.

Very dense ferruginised material was found 2.0m below the soil surface of zone A. This slowed excavations to a gradual stop. With the exception of zone A, no difficulty was experienced elsewhere when digging (down to a depth of at least 3.0m).

In soil zone A, minor to moderate groundwater seepage was experienced from below 0.7 m. The investigation did not find any groundwater seepages in soil zone B, although the moisture condition of the material increased substantially from below 2,5m deep.

Shear Strength Characteristics

Four undisturbed samples were taken from the study area and sent to a laboratory where saturated consolidated un-drained trial tests were performed. The parameters were measured under normal stresses of 50, 70 and 100kPa. The results are summarised in the table below. The results indicate low to moderate friction angles and correspondingly high cohesion values for the remolded sandy silt that blankets the site (van der Merwe, 2010).

Table 8: Measured Shear Strength Parameters.

Hole No.	Depth (m)	Dry density (kg/m³)	Normal stress (kPa)	Cohesion (kPa)	Angle of friction (degrees)
DB/8	2,4	1 651	50, 70, 100	23	21
DB/9*	2,0	1 549	50, 70, 100	6	12
DB/10*	0,0 – 2,2	1 777	50, 70, 100	48	11
DB/19*	0,0 – 2,3	1 753	50, 70, 100	52	10

Note: * = remolded sample.

Groundwater and soil chemistry

Very dense ferruginised material was found 2.0m below the soil surface of zone A. Above this impermeable level, minor to moderate groundwater seepage (a perched water table) was experienced at depths ranging from 0.7 to 1.3 m. The investigation did not find any groundwater seepages in soil zone B, although the moisture condition of the material increased substantially from below 2,5m to a depth of 3.0m.

Soil permeability

Falling head permeability tests were carried out on undisturbed and remolded disturbed samples. The results of these tests, shown in the table below, indicate that the coefficient of permeability of the remoulded soil samples as well as the in situ samples have a relative permeability of “impervious” in its re-compacted and natural state.

Table 9: Summary of Permeability Tests

Hole No.	Depth (m)	Initial moisture (%)	Dry density (kg/m³)	95% proctor density (kg/m³)	Coefficient of permeability (cm/s)
DB/6	0,1 – 1,1	15,0	1 793	1 808	5,0E-08
DB/6	1,1 – 2,1	16,9	1 858	1 845	6,5E-08
DB/8	0,4 – 1,8	13,9	1 852	1 960	2,1E-07
DB/8	2,4*	24,3	1 622		9,1E-08
DB/9	2,0*	17,3	1 504		1,6E-06
DB/10	1,5*	16,9	1 454		5,5E-07
DB/10	0,3 – 2,2	13,2	1 804	1 881	1,9E-06
DB/16	1,3 – 2,0	16,0	1 780	1 869	1,9E-07
DB/19	2,1*	20,7	1 539		3,3E-06

Note: * = Undisturbed sample

Soil Zone Characteristics

With the exception of zone A, no difficulty was experienced elsewhere with diggings. No problems are therefore expected in using conventional earth-moving machines to a depth of at least 3.0m below surface.

Very dense ferruginised material was found 2.0m below the soil surface of zone A. Above this impermeable level, minor to moderate groundwater seepage was experienced at depths ranging from 0.7 to 1.3 m.

The investigation did not find any groundwater seepages in soil zone B, although the moisture condition of the material increased substantially from below 2.5m to a depth of 3.0 m.

2.5 Land use and land capability

The proposed property (the remaining extent of portion 8 on the farm Modderfontein 236 IR) is 116.9 hectares in size. The AFGRI Daybreak abattoir is located on the north-western part of the AFGRI Poultry rear their own broiler chickens on the property. The N12 Highway runs through the farm, splitting it in two. The Daybreak Pan, offices, staff quarters, broiler houses and the abattoir are located to the east of the N12. There are some broiler houses located to the west of the N12, however, this land is mainly used for cultivation of crops.

The surrounding land uses comprise of residential developments and agricultural uses, together with the Enviroserve Holfontein disposal facility due west of the abattoir. According to the Environmental Potential Atlas for Mpumalanga, the land capability of the site and surrounds is classified as: cultivated land, vacant/unspecified and built-up land.

2.6 Vegetation

The proposed site has historically been used for crop production. Due to the disturbed nature of the vegetation onsite, a desktop assessment was undertaken to describe the nature of any natural vegetation surrounding the site.

This farm falls within the Grass Land biome region and is specifically classified as Eastern Highveld Grassland (GM 12) (Figure 40). The Grassland Biome is found mainly on the high central plateau of South Africa and the inland regions of KwaZulu-Natal and the Eastern Cape.

Frost, fire and grazing maintain the dominance of grasses and prevent the establishment of trees. Fire is a natural factor caused by lightning and regular burning is essential for maintaining the structure and biodiversity of this biome. Grasslands are unique ecosystems with rich and often highly specialised animal life, both above and below ground. Formerly, native grasslands supported vast herds of ungulates such as Blesbok, Black wildebeest and Springbok. Bird densities range from 50 to 380 birds per 100 ha, and include a wide range of species.

South African grasslands essentially comprise of a simple, single-layered herbaceous community of tussocked (or bunch) grasses. It is not generally known that the majority of plant species in grasslands are non-grassy herbs, most of which are perennial plants with large underground storage structures that can live for several decades. The Grassland Biome has an extremely high biodiversity, second only to the Fynbos Biome. At a 1 000 square metre scale, the average species richness of the Grassland Biome is even higher than those of most Fynbos communities, being surpassed only by Renosterveld.

Eastern Highveld grasslands occur in the Gauteng and Mpumalanga Provinces at an altitude of 1 520 – 1 780 metres above mean sea level, but can occur as low as 1 300 metres above mean sea level. The short dense grassland is dominated by species commonly found in grasslands (*Aristida, Digitaria, Eragrostis, Tristachya* and *Themeda* among others). There are small rocky outcrops scattered throughout the grassland where some woody species and wiry, sour grasses occur (*Celtis africana, Acacia caffra, Parinari capensis, Diospyros lycioides* subsp. *lycioides, Protea caffra, P. welwitschii* and *Rhus magalismontanum).*

The natural grasslands are considered endangered with only a small percentage conserved in statutory and private reserves. The target for conservation is 24% (Mucina & Rutherford, 2006). However, the site cannot be classified as true Eastern Highveld grassland as a result of its disturbed state.

Table 10: Dominant vegetation within the Eastern Highveld.

Taxa	Species
Graminoids:	*Digitaria monodactyla, D. tricholaenoides, Brachiaria serrata, Aristida aequiglumis, A. junciformis* subsp. *galpinii, A. congesta, Cynodon dactylon, Eragrostis chloromelas, E. plana, E. sclerantha, E. curvula, E. racemosa, Heteropogon contortus, Microchloa caffra, Monocymbium ceresiiforme, Loudetia simplex, Setaria sphacelata, Themeda triandra, Sporobolus africanus, S. pectinatus, Alloteropsis semialata* subsp. *eckloniana, Andropogon appendiculatus, A. schirensis, Trachypogon spicatus, Bewsia biflora, Tristachya leucothrix, T. rehmannii, Diheteropogon amplectens, Ctenium concinnum, Eragrostis capensis, E. patentissima, E. gummiflua, Rendlia altera, Harpochloa falx, Schizachyrium sanguineum, Panicum natalens, Setaria nigrirostris* and *Urelytrum agropyroides.*
Herbs:	*Haplocarpha scaposa, Berkheya setifera, Justicia anagalloides, Acalypha angustata, Pelargonium luridum, Chamaecrista mimosoides, Euryops gilfillanii, E. transvaalensis* subsp. *setilobus, Dicoma anomala, Ipomoea crassipes, Senecio coronatus, Pentanisia prunelloides* subsp. *latifolia, Helichrysum aureonitens, H. callicomum, H. caespititium, H. rugulosum, H. oreophilum, Selago densiflora, Wahlebergia undulata* and *Vernonia oligocephala.*
Geophytic Herbs:	*Haemanthus humilis* subsp. *hirsutus, Ledebouria ovatifolia, Gladiolus crassifolius* and *Hypoxis rigidula* var. *pilosissima.*
Succulent Herbs:	*Aloe ecklonis.*
Low Shrubs:	*Stoebe plumosa* and *Anthospermum rigidum* subsp. *pumilum.*

Table 11: Dominant vegetation surrounding the Daybreak Pan. Alien species are in bold (Tye, Bremmer & van Staden, 2010).

Grasses		Permanent	Seasonal	Temporary
Brachiaria brizantha	Common signal grass			X
Eragrostis curvula	Weeping love grass	X	X	
Eragrostis plana	Tough love grass		X	X
Hyparrhenia hirta	Common thatching grass			X
Hyparrhenia tamba	Blue thatching grass			X
Imperata cylindrical	Cottonwool grass		X	
Leersia hexandra	Rice grass	X		
Leersia hexandra	Guinea grass			X
Pennisetum clandestinum	Kikuyu grass		X	
Setaria sphacelata var. sphacelata	Common bristle grass	X	X	
Sorghum bicolor	Common wild sorgum			X
Themeda triandra	Red grass			X
Typha capensis	Bulrush	X		

Herbaceous		Permanent	Seasonal	Temporary
Bidens Formosa	Cosmos			X
Bidens pilosa	Blackjack			X
Cyperus sexangularis	Six-angled sedge	X	X	
Datura ferox	Large thorn apple			X
Helichrysum kraussii	Straw everlasting	X		
Persicaria serrulata			X	
Tagetes minuta	Khakibos			X
Verbena bonariensis	Purple Top			X

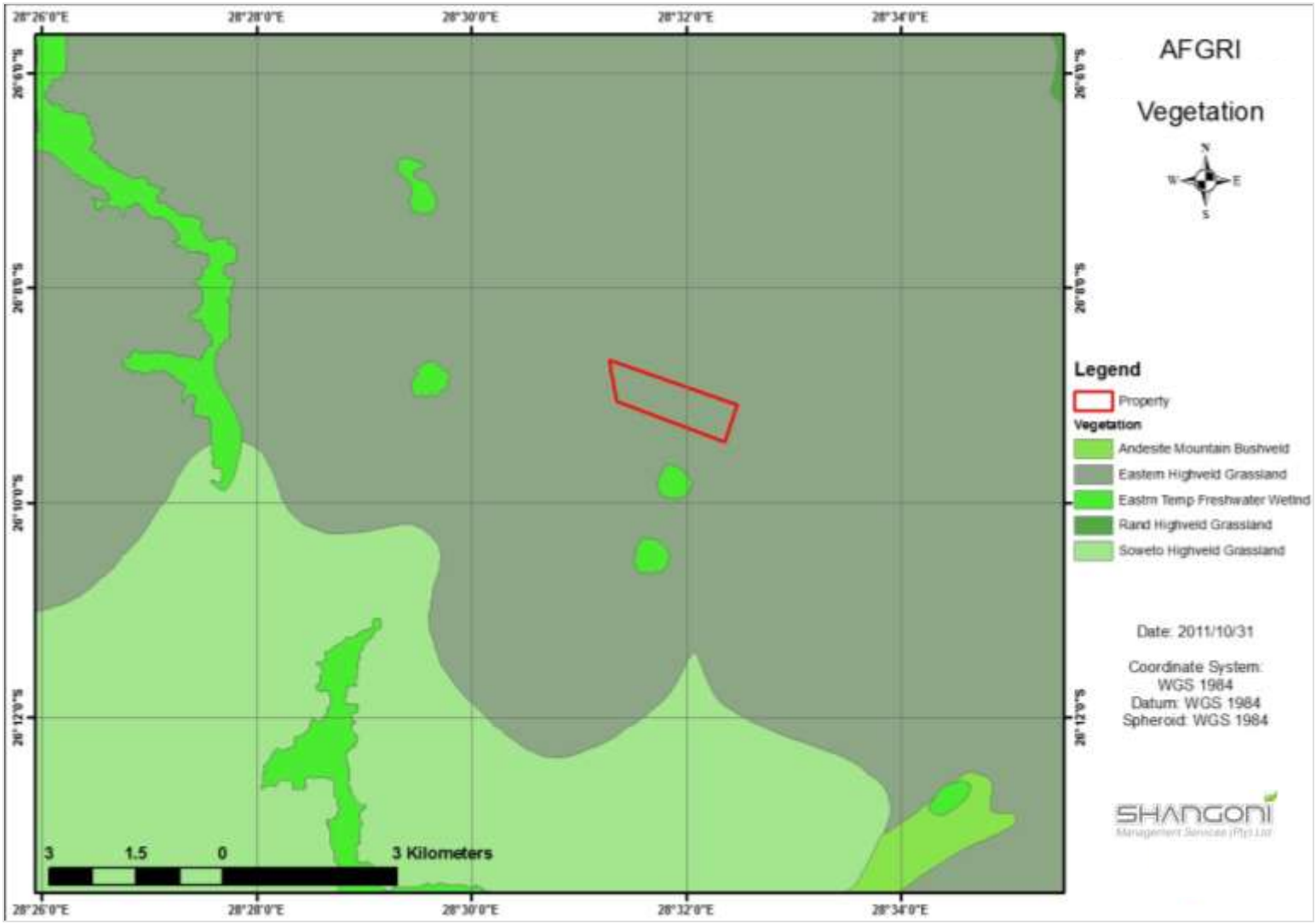


Figure 31: Vegetation map

2.7 Animal life

Macro invertebrates

Macro invertebrates are small animals that are dependent on water for all or part of their life cycle. Different species of macro invertebrates vary in sensitivity to water quality-, flow- and temperature pollution and are therefore used as bio-indicators to estimate the health of a watercourse.

Scientific Aquatic Services conducted an aquatic ecological assessment of the three pans in the vicinity of the site. The pans were numbered as in Figure 41 and Figure 43. A generally diverse aquatic community was observed during the assessment, however, the sensitivity ratings, observed at both the Daybreak Pan and Pan 2, were relatively low with the exception of the *Aeshinidae* species observed at the Daybreak Pan. Dragonflies are often found in reflecting water with lower dissolved oxygen levels.

The sensitivity rating in Pan 3 was found to be 41% higher than that of the Daybreak Pan. This can be attributed to natural filtering processes, lower temperatures and the higher oxygen levels observed in Pan 3 (Tye *et al.,* 2010).

Table 12: Aquatic Macro-Invertebrates noted during the assessment

Common Name	Scientific Name	Sensitivity (out of 15)
Leeches	*Hyrudinea*	3
Small minnow mayflies	*Baetidae (2sp)*	6
Dragonflies	*Aeshnidae*	8
Giant water bugs	*Belostomatidae*	3
Water boatmen	*Corixidae*	3
Backswimmers	*Notonectidae*	3
Ripple bugs	*Veliidae*	5
Predacious diving beetles	*Dytiscidae*	5
Midges	*Chironomidae*	2
Mosquitoes	*Culicidae*	1

Avifauna

During the aquatic ecological assessment of the three pans adjacent to the site, all bird species seen or heard were recorded. A total of 45 bird species were observed. Daybreak Pan housed the greatest

avifaunal diversity, with 32 species recorded. None of the species recorded during the survey were of conservation concern.

Table 13: Bird species noted during the assessment (Tye et al., 2010).

Common Name	Scientific Name	Conservation Status
African Sacred Ibis	*Threskiornis aethiopicus*	Not Threatened
Black-crowned Night Heron	*Nycticorax nycticorax*	Not Threatened
Black-headed Heron	*Ardea melanocephala*	Not Threatened
Blacksmith Lapwing	*Vanellus armatus*	Not Threatened
Cape Shoveller	*Anas smithii*	Not Threatened
Cape Turtle-Dove	*Streptopelia capicola*	Not Threatened
Cape Wagtail	*Motacilla capensis*	Not Threatened
Cattle Egret	*Bubulcus ibis*	Not Threatened
Common Fiscal	*Lanius collaris*	Not Threatened
Common Myna	*Acridotheres tristis*	Not Threatened
Common Waxbill	*Estrilda astrild*	Not Threatened
Glossy Ibis	*Plegadis falcinellus*	Not Threatened
Grey Heron	*Ardea cinerea*	Not Threatened
Grey-headed Gull	*Larus cirrocephalus*	Not Threatened
House Sparrow	*Passer domesticus*	Not Threatened
Laughing Dove	*Streptopelia senegalensis*	Not Threatened
Lesser Swamp Warbler	*Acrocephalus gracilirostris*	Not Threatened
Levaillant's Cisticola	*Cisticola tinnies*	Not Threatened
Little Stint	*Calidris minuta*	Not Threatened
Moorhen	*Gallinula chloropus*	Not Threatened
Purple Swamphen	*Porphyrio porphyrio*	Not Threatened
Red-billed Teal	*Anas erythrorhyncha*	Not Threatened
Red-eyed Dove	*Streptopelia semitorquata*	Not Threatened

Red-knobbed Coot	*Fulica cristata*	Not Threatened
Rock Dove	*Columba livia*	Not Threatened
Ruff	*Philomachus pugnax*	Not Threatened
Southern Masked- Weaver	*Ploceus velatus*	Not Threatened
Southern Red Bishop	*Euplectes orix*	Not Threatened
Three-banded Plover	*Charadrius tricollaris*	Not Threatened
White-winged Tern	*Chilodonias leucopterus*	Not Threatened
White-faced Duck	*Dendrocygna viduata*	Not Threatened
Yellow-billed Duck	*Anas undulata*	Not Threatened

Fish

Assessing the status of the fish community at a site can provide an indication of the long-term biological integrity of an aquatic environment. The Fish Assemblage Integrity Index (FAII), according to the protocol of Kleynhans (2002), was applied to the aquatic ecological assessment of the three pans adjacent to the site.

Table 14: A summary of the results obtained from the application of the FAII index

Type of Result	Daybreak Pan	Pan 2
Species present and number of individuals obtained	*None*	*Tilapia sparrmani 3*
Health and condition	Not applicable	Good
Expected FAII score	74.0	74.0
Observed FAII score	0	6.5
Relative FAII score	0	8.8
FAII classification (Kleynhans, 2002)	Class F (Critically modified)	Class F (Critically modified)

When compared to the reference score for pristine fish communities it can be deducted that the fish communities at Daybreak Pan and Pan 2 have suffered severe loss in integrity.

2.8 Surface water

2.8.1 Catchment areas

The proposed site is located within the C21D and B20B quaternary catchments, in the Vaal and Northern Olifants Water Management Areas, respectively. The Vaal primary catchment area has a surface run-off of 3360.88 - 4567.41 million m³ and the Olifants primary catchment a runoff of 2386.34 - 3360.88 million m³.

Figure 32: Distribution of relevant boreholes and pans across catchment boundaries.

The area surrounding the site is drained by three significant rivers, namely the Koffiespruit, Wilge and Kromdraaispruit (refer to Figure 34 below).

Figure 33: Google earth image of significant rivers in the Victor Khanye area.

2.8.2 Surface water quality and use

The Daybreak Pan is present on the site, to the north-west of the proposed site for the composting facility. There are also two other pans in close proximity to the site. “Pan 2” is located approximately 740m to the south of the site and “Pan 3” is located approximately 2km from the site, also to the south (refer to Figure 35 below). An ecological study, conducted for the area by Scientific Aquatic Services, indicated that the three pans were considered to be in a poor ecological condition due to both present and past impacts that include: significant alien vegetation encroachment, agricultural activities in the area, agricultural runoff, rural urbanisation and wastewater discharge from the AFGRI Daybreak abattoir. A new wastewater treatment works is being proposed to adequately treat the wastewater to acceptable standards and to thereby eliminate the pollution of the Daybreak pan.

The riverine systems in the B20B quaternary catchment area have a moderate diversity of habitat types, with sponge areas and wetlands increasing their ecological sensitivity and importance. The site has a moderate importance in terms of the following: conservation, rare and endangered species and the aquatic resources. The riverine resources have a moderate sensitivity to flow requirements, with species such as *Chiloglanis pretoriae* being flow dependant. The area has a low importance in terms of migration of aquatic species. The ecology of the area is considered to be moderately sensitive to changes in water quality.

As part of the aquatic ecological study, specifically for site testing of biota, specific water quality variables were measured at each of the sampling sites (the three pans). Parameters measured included pH, electrical conductivity (EC) and temperature. The results of on-site biota specific water

quality analyses were used to aid in the interpretation of the data obtained during the ecological assessment. Water samples were also taken for physico-chemical analyses at all three sites. The concentrations of most trace metals were below the detection limits of the ICP MS scan (Tye *et al.*, 2010). A summary of the findings of the water quality analysis for the three pans is given in the table below.

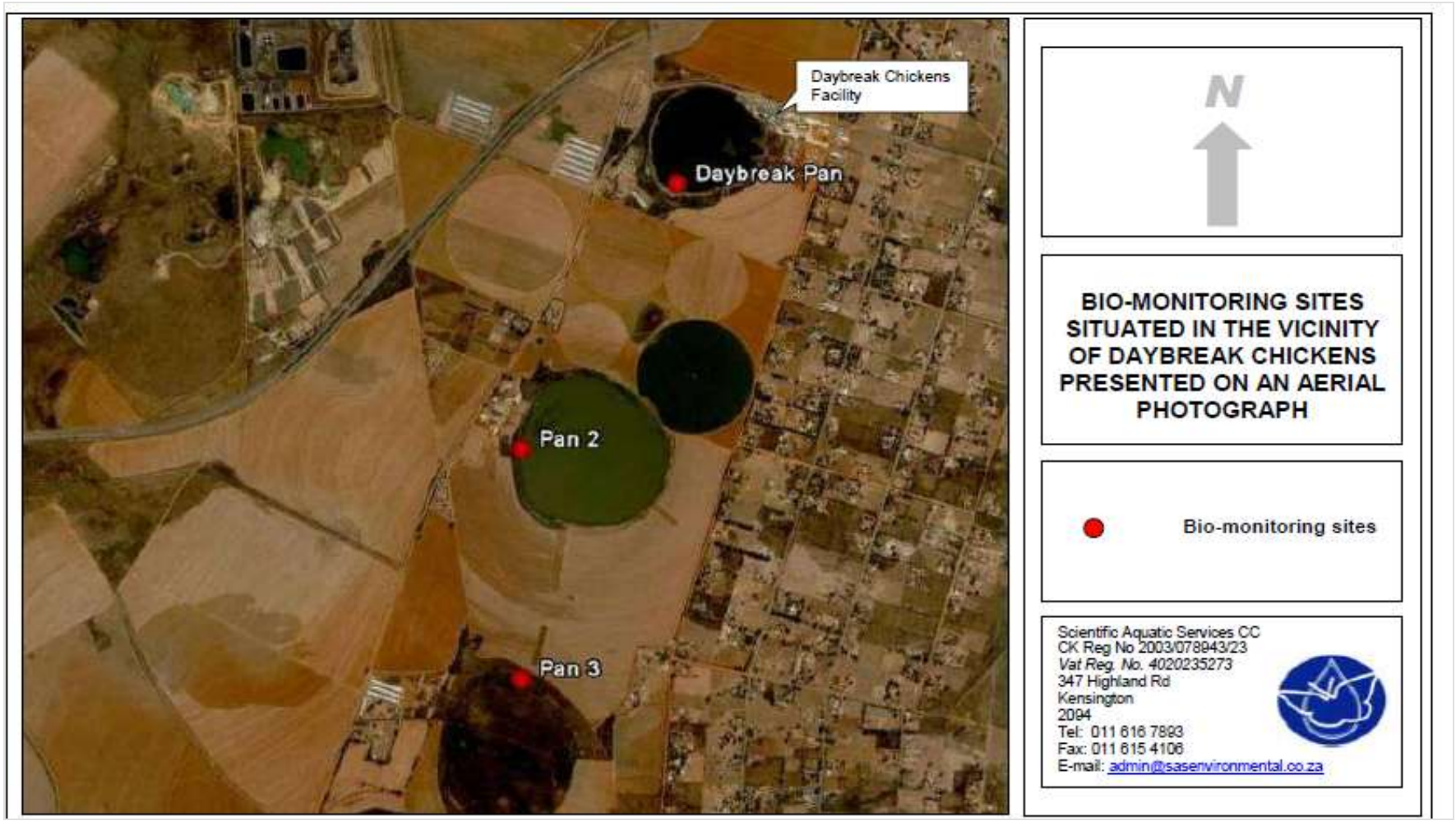


Figure 34: Three Pans analysed in the Aquatic Ecological Study conducted by Aquatic Scientific Services

Table 15: Summary of discussion, in aquatic ecological assessment, on water quality values found at the Daybreak Pan, Pan 2 and Pan 3

Water Quality Parameter	Daybreak Pan	Pan 2	Pan 3	Results / Discussion
Suitability for supporting a diverse aquatic community	Unsuitable	Unsuitable	Suitable	Pan 3 was considered to contribute to the ecological importance of the area.
Total dissolved solids (TDS)	1206mg/l	Approximately 18% higher than that of Daybreak Pan.	Decreases slightly by 2.9 %	The increase in TDS, from the Daybreak Pan, in Pan 2 exceeds the DWAF Transmission Wheeling Rate Guidelines (TWRG) for aquatic ecosystems and may negatively affect aquatic communities in the study area.
Chlorides	Elevated from natural sources	Elevated from natural sources - higher than at Daybreak Pan	Elevated from natural sources	Chlorides present may accumulate to toxic levels in moderately tolerant crops such as maize, sunflowers, sorghum and barley, thus reducing crop yields and resulting in foliar injury and posing a threat to human consumption.
Fecal coliform concentrations	Elevated	None	None	No fecal coliforms were observed in Pan 2 and Pan 3 and therefore the water can be regarded as being suitable for recreational use and irrigation. The fecal coliform concentrations found in the Daybreak Pan far exceed the target levels as considered necessary for the healthy functioning of natural aquatic ecosystems as well as those of the DWAF TWQR for irrigation purposes.
Fluoride	Elevated	Elevated	Elevated	All three sites are elevated, but fall within the DWAF TWQR for watering of animals.
Chemical oxygen demand (COD)	Elevated	Elevated	Elevated	This is indicative of large amounts of oxygen depleting processes taking place, which is considered natural for the marsh conditions observed at Pan 3.
Nitrate levels				Nitrate levels at the Daybreak Pan, Pan 2 and Pan 3 fall within the levels required for the DWAF TWQR for human consumption, irrigation, as well as agriculture (livestock watering).
Phosphates	Hypertrophic	Hypertrophic	Hypertrophic	Increased algal blooms as a result of eutrophication can lead to a

	conditions	conditions	conditions	decrease in biodiversity as most sensitive species cannot survive in waters with low levels of oxygen.
Electrical Conductivity (EC)	Significantly altered	Significantly altered	Significantly altered	The high EC values measured in the Daybreak Pan can be attributed to the abattoir wastewater. Daybreak is not the sole contributor to salt load in Pan 2 and Pan 3, as agricultural activities also play a role. This can be assumed because of the 77% increase in salt load at Pan 2. The EC at Pan 3 is slightly less than at Pan 2. It can be assumed that Pan 3 absorbs salts and nutrients into the soils, thus acting as a natural biological filter for the high salt concentrations observed in the area. Even though high salt levels in these pans is not considered unusual because of centripetal drainage patterns, high salt loads do place stress on the aquatic community.
pH	Almost Neutral	Elevated	Elevated	pH levels in Pan 2 and Pan 3 exceed DWAF TWQR for aquatic ecosystems. Daybreak Pan however is not a contributing factor to the high pH measured in Pan 2 and Pan 3.
Temperature	Elevated			The high temperature measured is a contributing factor to the poor habitat in and around the pan.

Daybreak Pan

Currently, hazardous wastewater from the AFGRI Daybreak abattoir is partially treated prior to its discharge into the Daybreak pan. The partial treatment is inadequate to meet water discharge standards. This has lead to contamination of the Daybreak Pan.

Not only does the poorly treated abattoir wastewater pose a health threat to humans, but high levels of nutrients in the water can also have a direct effect on the environment. High levels of nutrients (such as ammonium) in surface water will result in eutrophication of affected water bodies. The increase in biomass will aid in depleting the oxygen in the water and hence impact negatively on aquatic species. The Daybreak Pan is not lined, thus infiltration of contaminants into the soil and transmission to groundwater and Pan 2 and Pan 3 can occur.

A new wastewater treatment works is being proposed for the treatment of the abattoir wastewater (Waste Management License application in process at the National Department of Environmental Affairs, reference number 12/9/11/L832/6). The water quality of the Daybreak Pan will be significantly improved by improving the discharged wastewater quality, allowing the pan to rehabilitate over time. This will improve the water quality of the surrounding pans together with the environment in the region of the Northern border of the pan.

The highest level of water the Daybreak Pan can reach before it floods the existing abattoir is at an elevation of 1618.5m. The proposed composting facility will be situated above this level.

2.8.3 Water Authority

The relevant Water Authority is the Mpumalanga regional office (Bronkhorstspruit) of the Department of Water Affairs (DWA).

2.9 Groundwater

The proposed site is located within the C21D and B20B quaternary catchments, in the Vaal and Northern Olifants Water Management Areas, respectively. The local land use is mostly medium to large scale agriculture and the predominant groundwater uses in the area are domestic, irrigation and livestock watering.

Located on site are three boreholes, from which groundwater is abstracted to use in the AFGRI Daybreak abattoir. One of these boreholes (Site 2 Borehole) lies within the C21D quaternary catchment area and the remaining two (Maingate and Morewag) both lie within the B20B quaternary catchment area.

A borehole yield test was conducted by Shangoni AquiScience, a division of Shangoni Management Services (see Appendix F - Borehole yield testing for AFGRI Poultry Daybreak Abattoir).

The Vryheid Formation is classified as a D2 Intergranular and Fractured aquifer with typical yields of 0.1 - 0.5 l/s (360 – 1 800 litres/hour) while the Malmani subgroup is classified as a C5 Karst aquifer with typical yields in excess of 5 litres/s (>18 000 litres/hour) (Scholtz, 2012).

The following table summarises the findings of the borehole yield test.

Table 16: Abstraction boreholes at AFGRI Daybreak (Sundra)(Scholtz, 2012).

ID	Description	Coordinates	Type of pump	Geohydrology	WL (m)	Depth (m)	Current Yield (l/s)	Recommended Sustainable Yield (l/s)
Main Gate	AFGRI Daybreak abstraction borehole at Main Gate	S26.15208 E28.54098	Submersible	Vryheid shale/sandstone followed by Malmani dolomite	91.8	~200	8	7.01
Site 2	AFGRI Daybreak abstraction borehole at Site 2	S26.15250 E28.53149	Mono	Vryheid shale/sandstone followed by Malmani dolomite	110.6	~200	11	11.38
Morewag	AFGRI Daybreak abstraction borehole at Morewag farm (emergency supply)	S26.15674 E28.53931	Submersible	Vryheid shale/sandstone	73	~150	0.5	0.45

2.9.1 Groundwater Quality

During the borehole yield test, water samples were also taken for quality analyses of the three boreholes at Main Gate, Site 2 and Morewag. The water quality analyses can be seen below in the figure below.

The water quality was interpreted based on the South African National Standards for Drinking Water (SANS 241-1: 2011). No health risks are expected with the water use. Slight risks in terms of aesthetic appeal may remain for the Main Gate groundwater. An *E. coli* count of 1 CFU/100ml was recorded for the Morewag borehole and may be an indication of faecal pollution. However, mixing of the insignificant and sporadic quantities from the Morewag borehole with the significantly greater quantities from the Site 2 and Main Gat borehole before use in the AFGRI Daybreak abattoir most probably will result in negligible effects (Scholtz, 2012).

Borehole water may be used for irrigation purposes at the proposed composting facility. An alternative is for treated wastewater from the proposed wastewater treatment works to be utilised for irrigation purposes.

Analyses in mg/ℓ (Unless specified otherwise)	Sample Identification			SANS 241:2011
	Morewag	Site 2	Main Gate	(Standard Limits for Potable Water)
Sample Number	9731	9716	9717	
pH – Value at 25 °C	7.8	8.6	7.7	≥ 5 to ≤ 9.7
Electrical Conductivity in mS/m at 25 °C	50.4	48.4	53.1	≤ 170
Total Dissolved Solids (Calculated) *	323	311	340	≤ 1 200
Turbidity in N.T.U	2.3↓	0.2	10↓	≤ 1
Total Alkalinity as $CaCO_3$	224	124	208	—
Chloride as Cl *	26	69	26	≤ 300
Sulphate as SO_4	21	5	17	≤ 500
Fluoride as F	0.5	1	0.5	≤ 1.5
Nitrate as N *	<0.2	<0.2	<0.2	≤ 11
Ortho Phosphate as P *	<0.2	<0.2	<0.2	—
Total Organic Carbon as C [s]	1.3	<1.0	1.8	≤ 10
Total Coliform Bacteria / 100 mℓ *	16↓	0	20↓	≤ 10
E. Coli / 100 mℓ *	1↓	0	0	Not detected
Free & Saline Ammonia as N *	0.5	0.2	0.4	≤ 1.5
Sodium as Na	37	94	42	≤ 200
Potassium as K	5.5	1.2	5.6	—
Calcium as Ca	37	8	45	—
Magnesium as Mg	33	6	26	—
Aluminium as Al (in µg/l)	<100	<100	<100	≤ 300
Antimony as Sb (in µg/l) *	<10	<10	<10	≤ 20
Arsenic as As (in µg/l) *	<10	<10	<10	≤ 10
Cadmium as Cd (in µg/l) *	<3	3	<3	≤ 3
Total Chromium as Cr (in µg/l)	<25	<25	<25	≤ 50
Cobalt as Co (in µg/l)	<25	<25	<25	≤ 500
Copper as Cu (in µg/l)	<25	<25	<25	≤ 2 000
Iron as Fe (in µg/l)	335	<25	1 830	≤ 2 000
Lead as Pb (in µg/l) *	<10	<10	<10	≤ 10
Manganese as Mn (in µg/l)	113	<25	725↓	≤ 500
Nickel as Ni (in µg/l)	<25	<25	<25	≤ 70
Vanadium as V (in µg/l) *	<25	<25	<25	≤ 200
Zinc as Zn	0.485	<0.025	0.377	≤ 5
% Balancing	95.5	95.7	92.3	—

Figure 35: Water quality analyses

2.10 Sensitive landscapes

Wetlands

A wetland assessment and delineation was conducted by R.F. Terblance in April 2013 (See Appendix F). The assessment identified two isolated wetland systems within 500m of the proposed site. The following information was extracted from the wetland assessment and delineation report.

The larger depression (referred to as the Daybreak Pan) can be found on the northern part of the property, north-west of the proposed site. A small depression, isolated in cultivated fields, is approximately 740m south of the proposed site (refer to the figure below).

Both wetlands (pan depressions) have an ecological status (PES) of Category E: Seriously modified with extensive losses of natural habitats and basic ecosystem functions. The ecological importance and sensitivity (EIS) of both pan depressions at the site is low/marginal, meaning that the wetlands, in their present state, are not sensitive and the biodiversity is ubiquitous and not sensitive to flow and habitat modifications (Terblanche, 2013).

Figure 36: Two isolated wetlands systems present in the vicinity of the site

2.11 Sites of archaeological and cultural interest

The South African Heritage Resources Agency (SAHRA), in their letter attached under Appendix E, has indicated that it is unlikely that any significant impacts on heritage resources will result from the proposed development and that they therefore have no objection to the development.

They further state that if any evidence of archaeological sites or remains (such as remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials, fossils or other categories of heritage resources are found during the proposed activities, AFGRI should immediately contact the SAHRA APM Unit, and a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation might be required.

2.12 Air Quality

The following atmospheric emissions are commonly produced during the composting process:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Volatile Organic Compounds (VOCs) or Reactive Organic Gases (ROG);
- Hydrogen Sulphide (H_2S) should anaerobic conditions be present;
- Particulate matter; and
- Ammonia (NH_4).

Odours are also commonly associated with composting facilities. The composting method and C:N (carbon:nitrogen) ratio will play an important role in determining the type and amount of emissions and odours produced.

2.13 Noise

Noise at the proposed site is generated mainly by activities at the AFGRI Daybreak abattoir, vehicle movements on the adjacent Modderfontein Road and N12 highway, broiler raising activities on the property, farming activities and residential activities.

Sound is inversely proportional to the distance from the source and can get absorbed by buildings and vegetation barriers. Noise intensities (dB) will be at their highest on site and will decrease as one moves away from their sources.

2.14 Visual Aspects

The proposed site will be visible to motorists travelling on the dirt road to the south of the site, Modderfontein Road adjacent and to the east of the site and at a distance from Main Road to the north of the site and Katboschfontein Road to the west of the site.

2.15 Socio-economic aspects

The site is located within the Victor Khanye Local Municipality.

2.15.1 Demography

According to 2011 census, 75 452 people formed part of the 20 548 households in the Victor Khanye Local Municipality. The average household size is 3.7 people per household. There are 106 men for every 100 women in the municipality and the table below shows the age structure of the municipality.

Table 17: Victor Khanye local municipality age structure - Census 2011 (Statistics South Africa, 2011)

Age Group	Percentage
Under 15 years of age	28.2%
15 to 64 years of age	67.1%
Over 65 years of age	4.7%
Total population	**100%**

2.15.2 Major economic activities

The Victor Khanye Local Municipality is strategically located between Johannesburg in the Gauteng province and Nelspruit in the Mpumalanga province and forms part of the Nkangala District Municipality.

Farming is the dominant economic activity in the municipality, occupying approximately 60% of the total physical area. However, in terms of output and proportional contribution to the local economy, the largest sector is trade, followed by agriculture and mining sectors.

2.15.3 Unemployment and employment

The 2011 census found that the official unemployment rate was 28.2% and the youth unemployment rate (15 to 34 years of age) was 35.80%. The dependency ratio is 49.1 per 100 people between the ages of 15 and 64 years (Statistics South Africa, 2011).

3. APPLICABLE LEGISLATION AND GUIDELINES

The table below provides an indication of the main legislation, policies and / or guidelines applicable to the composting facility project.

Table 18: Applicable legislation, policies and / or guidelines

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
Laws of General Application		
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	-	To establish a Constitution with a Bill of Rights for the RSA.
Environment Conservation Act, 1989 (Act No. 73 of 1989, as amended)	Mpumalanga Department of Economic Development, Environment and Tourism	To control environmental conservation.
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	Mpumalanga Department of Economic Development, Environment and Tourism	To provide for the integrated management of the environment, and to regulate the 'Duty of Care' Principle.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000, as amended)	-	To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.
Air Quality and Noise		
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Gert Sibande District Municipality	To reform the law regulating air quality to protect the environment by providing reasonable measures for the prevention of pollution. To provide for national norms and standards regulating air quality monitoring, management and control.
Water Management		
National Water Act (NWA), 1998 (Act No. 36 of 1998)	Department of Water Affairs	To provide for fundamental reform of the law relating to water

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
		resources.
Waste Management		
National Environmental Management: Waste Act (Act No. 59 of 2008)	National Department of Environmental Affairs	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation.
National Environmental Management: Waste Act (Act No 59 of 2008)	National Department of Environmental Affairs	To regulate the classification and management of waste in a manner which supports and implement the provisions of the Waste Act.
Biodiversity		
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	Mpumalanga Department of Economic Development, Environment and Tourism	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Department of Agriculture, Rural Development and Land Administration	To provide for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.
National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)	Department of Agriculture, Rural Development and Land Administration	To reform the law on veldt and forest fires.
Agricultural Pest Act, 1983 (Act No. 36 of 1983, as amended) – GN R276 of 5 March 2004	Department of Agriculture, Rural Development and Land Administration	To regulate plants, plant products and other regulated articles when imported into South Africa.
Soil and Land Management		
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	Mpumalanga Department of Economic Development, Environment and Tourism	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.

Title of legislation, policy or guideline	Administering authority	Aim of legislation, policy or guideline
Environment Conservation Act, 1989 (Act No. 73 of 1989, as amended)	Mpumalanga Department of Economic Development, Environment and Tourism	To control environmental conservation.
Heritage and Archaeological Resources		
National Heritage Resources Act No 25 of 1999 (Act No. 25 of 1999, as amended)	South African Heritage Resources Agency	To introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations
Protected Areas		
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003, as amended)	Mpumalanga Department of Economic Development, Environment and Tourism	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Planning of New Activities		
National Environmental Management Act, 1998 (Act No. 107 of 1998). National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008).	Mpumalanga Department of Economic Development, Environment and Tourism	To provide for the integrated management of the environment and to regulate the 'Duty of Care' Principle.
EIA Regulations R 543, R 544, R 545 and R 546, dated 18 June 2010) under the NEMA, 1998	Mpumalanga Department of Economic Development, Environment and Tourism	To regulate and control the authorisation of certain listed activities.
Government Notice (GN) 718: "List of waste management activities that have, or are likely to have a detrimental effect on the environment", dated 2009.	National Department of Environmental Affairs	To regulate and control the authorisation of certain waste-related listed activities.

4. PUBLIC PARTICIPATION PROCESS

4.1 Objectives of the Public Participation Process (PPP)

Section 24 of the Constitution of the Republic of South Africa of 1996 guarantees everyone the right to an environment that is not harmful to their health and well-being and to have the environment protected for the benefit of present and future generations. In order to give effect to this right, the National Environmental Management Amendment Act (NEMA), 2008, came into effect.

In terms of Section 24 (4) of the NEMA, 2008, procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, *inter alia*, ensure, with respect to every application:

- Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
- That the findings and recommendations flowing from an investigation, the general objective of integrated management laid down in NEMA, 2008, and the principles of environmental management set out in Section 2 of NEMA, 2008, are taken into account in any decision made by the organ state in relation to any proposed policy, programme, process, plan or projects, consequences or impacts; and
- Public information and participation procedures that provide all integrated and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures.

One of the general objectives of integrated environmental management set out in Section 23(2) (d) of NEMA, 2008, is to: “ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment”.

The National Environmental Management Principles as stipulated in NEMA, 2008, say that:

- “Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably; and
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have an opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantage persons must be ensured”.

4.2 Legislation and guidelines followed for the PPP

The public participation process for this project was conducted by Shangoni Management Services in terms of:

- The procedures and provisions in terms of the NEMA (as amended), 2008;
- Chapter 6 of the EIA Regulations of 2010;
- GN 807; Public Participation Guideline in the Environmental Impact Assessment Process, dated October 2012; and
- Other relevant legislation such as the Promotion of Access to Information Act (PAIA), 2000.

Refer to Appendix E for an extract regarding the required public participation process to be followed, taken from the relevant legislations and guidelines.

4.3 Public Participation Process followed

4.3.1 Identification and registration of I&APs and key stakeholders

The table below lists the adjacent landowners identified and notified (by means of e-mail, telephone, fax and/or post) of the proposed project. Copies of the notifications to the I&APs have been included in Appendix E.

Table 19: List of adjacent landowners identified and notified

Property owner	Address or property description
Ronél Risseeuw	108 Modderfontein Road, Rietkol AH
Mr. J. P. du Plessis	112 Modderfontein Road, Rietkol AH
K. Noeth	114 Modderfontein Road, Rietkol AH
Mr. Tony Rovani	383 Modderfontein Road, Rietkol AH
Johanna van Zyl	c/o Modderfontein and Main Road, Sundra
Mr. Johan Ferreira	120 Modderfontein Road, Rietkol AH
Mr. Marius Snyman	122 Modderfontein Road, Rietkol AH
Enviroserv - Holfontein	Portion 23/24 of the farm Holfontein
Unknown	86 Modderfontein Road, Rietkol AH
Mr. Jan Swanepoel	Corner of Modderfontein Road and 8th Street
Susan Muller	Portion 36 of the farm Modderfontein 236 IR
Mr. Daan Duvenaghe	Portion 10 of the farm Modderfontein 236 IR
S.M. van Dyk	Portion 7 & 35 of the farm Modderfontein 236 IR
W.D. Emmett	379 Modderfontein Road, Rietkol AH
Elizabeth Smith	369 Modderfontein Road, Rietkol AH

All organs of state that may have jurisdiction in respect of the proposed project are considered to be registered I&APs.

The following organs of state were notified of the proposed project:

- Victor Khanye Local Municipality
- Nkangala District Municipality
- Mpumalanga Department of Agriculture, Rural Development and Land Administration
- Department of Water Affairs
- South African Heritage Resources Agency (SAHRA)

Copies of the notifications to the organs of state and adjacent land owners have been included in Appendix E, and examples are included in the figures below.

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Management Services (Pty) Ltd

Shangoni Management Services Pty (Ltd)

Tel +27(0)12 807 7036 Fax +27(0)12 807 1014
E-mail info@shangoni.co.za www.shangoni.co.za
Block C8, Block@Nature 472 Botterklapper Street The Willows 0081
PO Box 74726 Lynnwood Ridge 0040

17 May 2013

DEDET EIA Ref: 17/2/3 N-242; DEA Ref: 12/9/11/L1215/6; SMS Ref: AFG-DEL-12-11-16

South African Heritage Resources Agency (SAHRA)
PO Box 4637
Cape Town
8000

Attention: Mr. Phillip Hine

APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND A WASTE MANAGEMENT LICENSE: AFGRI POULTRY COMPOSTING SITE

AFGRI Poultry (Pty) Ltd. is planning to establish and operate a poultry waste composting site on Portion 8 (remaining extent) of the farm Modderfontein 236 IR. The proposed composting site requires environmental authorisation in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and a Waste Management License in terms of Section 19 and 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

For the application for environmental authorisation, a Basic Environmental Impact Assessment process in terms of Sections 21 to 25 of Government Notice R. 543 of the EIA Regulations of 18 June 2010 must be conducted. A full Scoping and Environmental Impact Assessment process in terms of Sections 26 to 35 of Government Notice R. 543 of the EIA Regulations of 18 June 2010 must be conducted for the Waste Management License Application.

Shangoni Management Services (Pty) Ltd. was appointed as the Independent Environmental Assessment Practitioner (EAP) responsible for the two above mentioned Environmental Impact Assessment processes. Shangoni has submitted, on behalf of AFGRI Poultry (Pty) Ltd, an application for environmental authorisation for the composting facility to the Mpumalanga Department of Economic Development, Environment and Tourism. An application for a Waste Management License has also been submitted to the National Department of Environmental Affairs.

Directors RB Huyser J Nel JA van Rooy CJ Potgieter HL de Villiers

Figure 37: Example of registered letters sent to I&APs and Organs of State (1)

Attached please find a background information document, locality map of the site, and a stakeholder registration form in respect of the application. Should you wish to register as an Interested and Affected party for the above mentioned project, please complete the attached stakeholder registration form and send it to us before or on the **24th of June 2013.** Should you wish to not be part of this EIA process, it will be appreciated if we could receive a written confirmation thereof to enable us to continue with the application.

Please do not hesitate to contact the undersigned should you require any additional information.

Contact Details: Shangoni Management Services (Pty) Ltd.
Miss Lizette Crous
E-mail: lizette@shangoni.co.za
Tel: 012 807 7073
Fax 2 E-mail: 086 643 5360
Fax: 012 807 1014
Online Participation: Go to www.shangoni.co.za and click on Public Documents.

Regards,

Miss Lizette Crous
Environmental Assessment Practitioner

Figure 38: Example of registered letters sent to I&APs and Organs of State (2)

Figure 39: Proof of registered letters (1)

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(with an insurance option/met 'n versekeringsopsie)

Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender:
Naam en adres van afsender: Shangoni Management Services
PO Box 71720 Lynnwood Ridge 0040

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-klantafskrif
1	[illegible]					REGISTERED LETTER
2	[illegible]					REGISTERED LETTER
3	Po Box 557 [illegible] 2300					CUSTOMER COPY
4						
5						
6						
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted
Getal briewe gepos 2

Signature of client
Handtekening van kliënt

Signature of accepting officer
Handtekening van aannemerbeampte

Date stamp
WILLOWWAY POST OFFICE 17 MAY 2013
Datumstempel

SHANGONI
Management Services (Pty) Ltd

ACKNOWLEDGMENT OF RECEIPT

NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND A WASTE MANAGEMENT LICENSE: AFGRI POULTRY COMPOSTING SITE (DEDET EIA Ref: 17/2/3 N-242; DEA Ref: 12/9/11/L1215/6; SMS Ref: AFG-DEL-12-11-16)

NAME & SURNAME: [illegible]

ADDRESS: [illegible]

POSTAL ADDRESS: PO Box 114, [illegible] 2200

TEL: 013 [illegible]

EMAIL: [illegible]

DATE: 10/7/2013

SIGNATURE:

Acknowledge receipt of the following:

* 1 x Notification letter, Background Information Document, Stakeholder Registration Form, and Locality Map for the Application for Environmental Authorisation and a Waste Management License: AFGRI Poultry Composting Site (DEDET EIA Ref: 17/2/3 N-242; DEA Ref: 12/9/11/L1215/6; SMS Ref: AFG-DEL-12-11-16)

Figure 40: Proof of registered letters (2) and hand delivery to one adjacent land owner

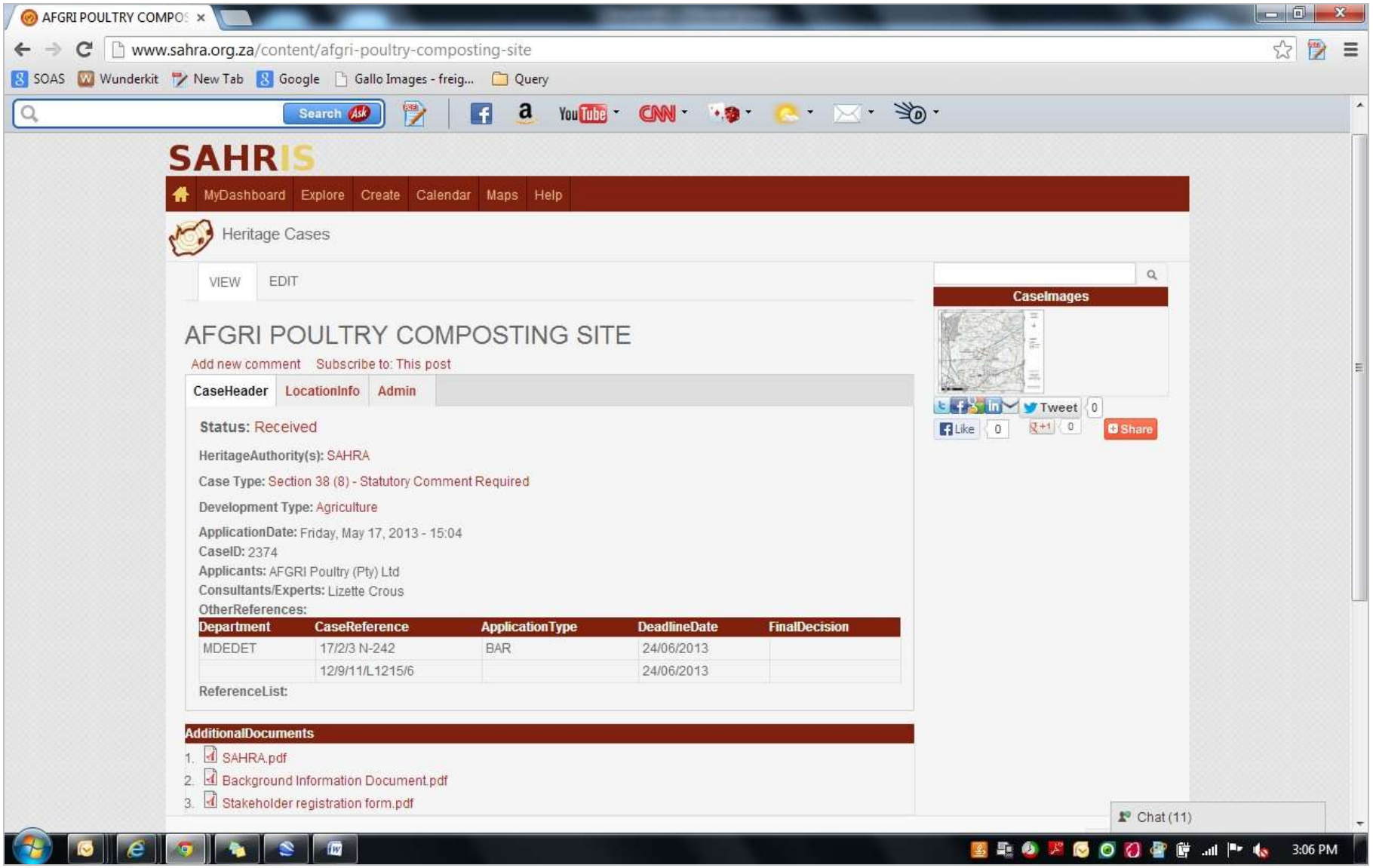

Figure 41: Proof of loading notification documents onto SAHRIS

4.3.2 Methods of notification

4.3.2.1 Advertisement(s)

The proposed project was advertised in two newspapers, namely the Beeld and Streek News, on the 15th and 17th of May 2013, respectively. These newspapers were found to be the most appropriate newspapers in terms of their accessibility to I&APs. A copy of the advertisements and proof of the placement thereof is attached in Appendix E. Refer also to the figures below.

Streek News : 17 May 2013 11

community news/gemeenskapsnuus

Die landskap rondom ons

Die Albert Silwermyn

Figuur 1: Ysterhoed (Albert Ertsspleet) met die murasie van skag 1 in die agtergrond.

Figuur 2: Malagiet/trippkeiet/marshiet samestelling op kwarts.

Figuur 3: Steriele bo-grond as gevolg van swaelsuur by die ou meule en sy damme

Figuur 4: Skag 3 in 'n vervalle toestand. Agter die houtbarikade bereik die skag 'n diepte van bykans 70m.

Dr Paul Meulenbeld

DIE Albert Silwermyn, wes van Rhenosterkop en noord van Bronkhorstspruit, is in 1885 ontdek op grond van 'n opvallende ysterhoed van 15m breed (Fig 1), ook die Albert Ertsspleet genoem, wat voorkom in grys Bosveld-graniet met duidelike, groot, wit (genoem eerstelinge) veldspaat-kristalle (meestal 'n kalium, aluminium en silikaverbinding).

Die myn was in bedryf van 1885 tot in 1910 met tydelike sluitings tussen in. Die myn word aangedui op kaarte wat dateer uit die dae van die ZAR. Inskripsies op geboue en ander strukture dui daarop dat bedrywighede ook plaasgevind het gedurende 1918 (geteken deur ene Hans) en 1968.

Voortdurende eksplorasie van die ertsliggaam (silwer, lood en koper) het ook plaasgevind, aangedui deur kernboorgate en in literatuur, alhoewel die voor-komste onekonomies is om hui-diglik verder te myn.

Die myn het 'n diepte van ongeveer 70m bereik, 20 000 ton erts is gemyn en die erts-graad was gemiddeld 10% koper en 1.35kg/t silwer. Op 'n diepte van 200m word geen erts aangetref nie (bevind deur boorgatstudies). Hierdie ertsafsetting is toe te skryf aan die inplasing van die Bosveldstollingskompleks (draer van platinum, chroom en vana-dium) en is uniek in die sin dat uraan ook aangetref word.

Tydens die besoek aan die myn is primêre swart uraan en sekondêre geel en groen uraan (verander deur die werking van water) gevind deur middel van 'n Geiger-instrument. Die silwerafsettings kom hoofsaaklik voor in die minerale tetrahedriet en borniet, wat beide koper bevat. Die tetrahedriet is ook veront-woordelik vir voorkomste van sink en antimoon. Lood kom in 'n mindere mate voor. Aansienlike hoeveelhede ystererts is ook aanwesig soos vergestalt in die ysterhoed.

Die ysterhoed dui sekondêre koperafsettings aan deur die groen kleur van malagiet. Die ys-terhoed maak die area 'n geleier van elektrisiteit en is baie gevaar-lik om te betree tydens donder-storms as gevolg van die hoë frek-wensie van weerliginslag, soos gesien kan word in bees-geraamtes langs die ysterhoed.

Ondersoeke by die skagte (meer as vyf skagte is waar-geneem) het sulfiedminerale (swaelgebonde) soos piriet (gek-kegoud/fool's gold), chalkopiriet (kopererts), hematiet (ystererts), borniet (kopererts), uraniniet (uraanerts) en hul verwerings-produkte opgelewer, insluitende koperryke verweringsprukte soos asuriet en malagiet.

'n Kwartsaar is oopgekap en het kwartskristalle bedek met malagiet/trippkeiet/marshiet samestelling (Figuur 2) of kwarts met donker rooi hematietin-sluitsels opgelewer. Trippkeiet is nog net aangeteken in Chile en Marokko.

Die impak van die silwer-herwinning, met sy byprodukte, kan gesien word in die landskap stroomaf van die ou meule en damme waar al die bo-grond waarskynlik versuur het agv swaelsuur en arseen, sodat oor die 100-jaar wat reeds verloop het sedert die myn se sluiting nog geen enkele plantegroei daarin waargeneem kan word nie en gronderosie die onderliggende graniet blootgelê het (Figuur 3).

Die myngebied is gevaarlik om te betree omdat die meeste skagte nie fisies toegemaak is nie maar slegs met doringdraad in 'n swak toestand.

Skag 3 se aanvanklike houtbeveiliging het ingegee na die aanslae van die elemente oor die geduldige tyd, sien Figuur 4. Algehele toegang tot die myn is oor privaatgrond en die pad is in 'n swak toestand.

Laerskool Eloff Top 5

Graad 7:
Karel Cronjé (1) en Christelle Enslin (2).

Graad 5:
Nikki le Roux (1), Marlize Trollip (3) en Louise Schoonraad (2).

Graad 6:
(Voor) Chanri Botha (7), Duné Wolmarans (9), Renier Nienaber (8) en Danie Uys (2); (Middel) Ruann (1) Ruthven, Sanele Sibangoni (3) en Elani Botha (5); (Agter) Bevan Slabbert (4) en Hannah Kasselman (6).

Graad 4:
(Agter) Clarinda van Niekerk (3), Lané Enslin (1), Kayla Schoonwinkel (7), Adriaan Booysen (6) en Reinardt Bosch (8); (Voor) Louis Breytenbach (2), Ané Vosloo (5), Amor Enslin (4) en August Fourie (9).

NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND A WASTE MANAGEMENT LICENSE

Notice is hereby given that an application for environmental authorisation in terms of the EIA Regulations of 2010 (Regulations in terms of Chapter 5 of the National Environmental Management Act of 1998, as amended) has been lodged with the Mpumalanga Department of Economic Development, Environment and Tourism. A Waste Management License Application in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) has also been lodged with the National Department of Environmental Affairs.

Ref. Number: DEDET: 17/2/3 N-242; DEA: 12/9/11/L1215/6

Applicant: AFGRI Poultry (Pty) Ltd.

Project Name: AFGRI Poultry Composting Site

Project Location: Portion 8 (remaining extent) of the farm Modderfontein 236 IR

Project Description: The proposed project will include the following:

The establishment and operation of a composting site for poultry waste.

Activities applied for: National Environmental Management Act, 1998 (Act No. 107 of 1998): Listing notice 1, R. 544 of 18 June 2010, Activity No. 22: The transformation of undeveloped, vacant or derelict land to – (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - except where such transformation takes place – (i) for linear activities; or (ii) for purposes of agriculture or afforestation, in which case Activity 16 of Notice No. R. 545 applies. **National Environmental Management Act, 1998 (Act No. 107 of 1998): Listing notice 1, R. 544 of 18 June 2010, Activity No. 11:** The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

Waste Management License Application according to GN 718 of 3 July 2009 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)): Category A, No. 2; Category A, No. 17; Category A, No. 18; Category B, No. 1; Category B, No. 4; Category B, No. 5; Category B, No. 11.

Invitation to participate: Should you wish to be included in the register of Interested and Affected Parties, please submit your name, contact information, and interest in the matter **in writing** to the below address not later than 24 June 2013.

Independent Environmental Assessment Practitioner:
Shangoni Management Services (Pty) Ltd. PO Box 74726, Lynnwood Ridge, Pretoria, 0040. Contact Person: Miss. L. Cross. Tel: (012) 807 7036, Fax: (012) 807 1014, Fax to E-mail: 086 643 5360, E-mail: lizelle@shangoni.co.za. For Online Participation, go to www.shangoni.co.za and click on Public Documents.

SHANGONI
Management Services (Pty) Ltd

Figure 42: Proof of newspaper advertisement placed in the Streek News

Figure 43: Proof of newspaper advertisement placed in the Beeld

4.3.2.2 Placement of site- and public notices

Notice was also given to Interested and Affected Parties (I&APs) via the placement of notice boards. Notice boards were placed at two different, noticeable and conspicuous places (at the proposed site and at the entrance to the AFGRI Daybreak abattoir). A copy of the site notice and photographs of the site notices are attached in Appendix E. Refer also to the figures below.

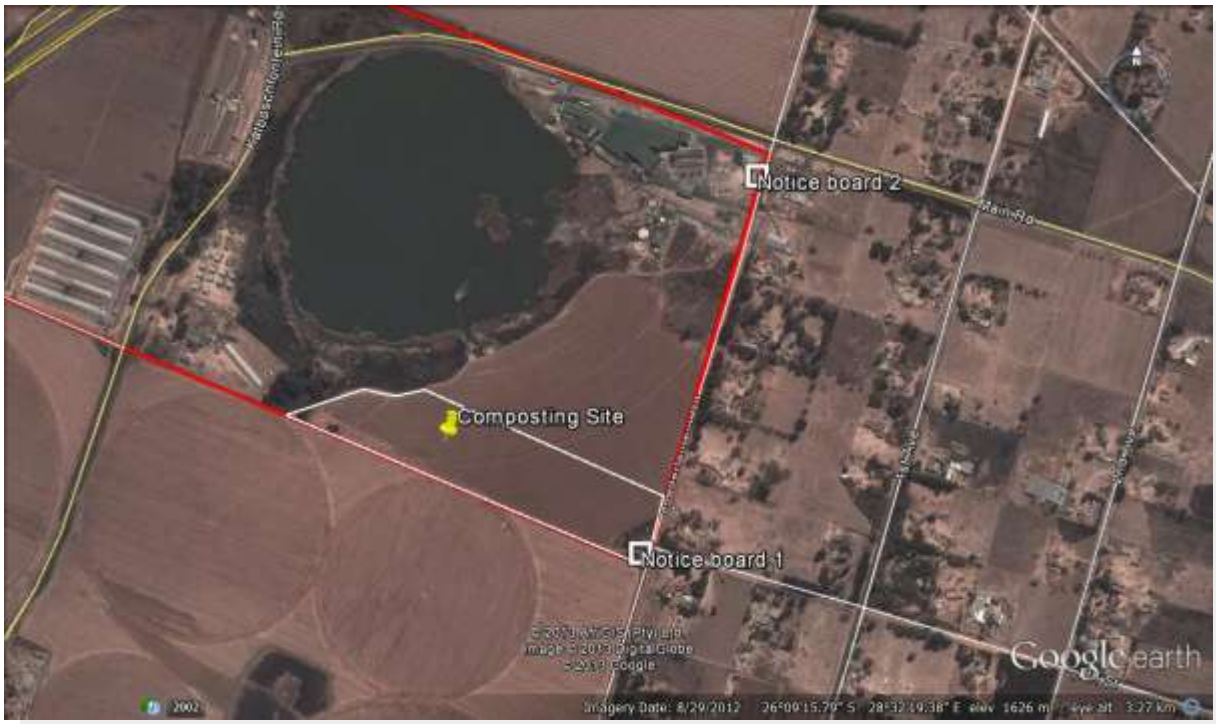

Figure 44: Locations of the notice boards

Figure 45: Site notice 1

Figure 46: Site notice 2

Figure 47: Site notice 2 on the entrance gate to the Daybreak abattoir

4.3.2.3 Background Information Document

The Background Information Document (BID) provides background information pertaining to the proposed project and is intended to inform I&APs of the project. The BID also includes a registration form that I&APs, stakeholders and organs of state are encouraged to complete in order to register as I&APs for the proposed project.

The BID was sent to adjacent land owners, organs of state and stakeholders together with the notification letters mentioned previously. This correspondence was sent via registered mail and hand delivery where required.

Copies of the BID and proof of distribution of the BID to the adjacent landowners and organs of state has been attached as Appendix E.

4.3.3 I&AP register

Once all adjacent landowners, organs of state and the public were notified of the proposed project, an IAP register (as provided in Appendix E) was compiled. The table below provides an extract of the I&AP register indicating the organs of state and other I&APs that have been registered.

Table 20: Registered I&APs

No.	Name	Department / Interest
Organs of State		
1	Mr. Jan Venter	Mpumalanga Department of Agriculture, Rural Development and Land Administration
2	Ms. Ntombifutsi Thembi Mathebula	Mpumalanga Department of Agriculture, Rural Development and Land Administration
3	Mr. Sam Lekhuleni	Victor Khanye Local Municipality
Registered I&APs		
1	Mr. Jan Swanepoel	Adjacent land owner

Refer also to Appendix E for a detailed I&AP register including contact information for all registered organs of state and I&APs.

4.3.4 Public meeting(s)

Thus far, no public meetings have been required for this project.

4.3.5 Access and opportunity to comment on written submissions

Electronic copies (and hard copies in the case of the Department of Water Affairs) or this draft Basic Assessment Report will be made available to the public for review for a period of forty (40) days. An electronic copy of the draft Basic Assessment Report will also be posted on the Shangoni Management Services' website (www.shangoni.co.za) for public comment for the same review period.

4.3.6 Consultation with the relevant Authorities

4.3.6.1 Application form in terms of the NEMA, 1998

The Application for Environmental Authorisation in terms of the National Environmental Management: Act, 1998 (Act No. 107 of 1998) was submitted to the Mpumalanga Department of Economic Development, Environment and Tourism. A reference number (17/2/3 N-242) was subsequently issued by the Department.

4.3.6.2 Authorities meeting(s)

No meetings with the Mpumalanga Department of Economic Development, Environment and Tourism have been required thus far.

4.3.7 Further consultation with relevant Authorities

No meetings or consultation with the Mpumalanga Department of Economic Development, Environment and Tourism is presently foreseen.

4.3.8 Comments and responses

All issues, comments and questions received from I&APs thus far have been summarised in the table below. Copies of the comments received have also been included in Appendix E.

Table 21: Comments and responses report

Department/ interest	Date	Method of comment	Issue raised	Response
South African Heritage Resources Agency (SAHRA) – Mr. Philip Hine	22-05-13	Uploading of comments letter onto the SAHRIS website and downloaded from there by Shangoni Management Services.	Our Ref: 16/1/5/15 Afgri Poultry Composting **AFGRI Poultry (Pty) Ltd. Is planning to establish and operate a poultry waste composting site on Portion 8 (remaining extent) of the farm Modderfontein 236 IR.** Thank you for your indication that development is to take place in this area. In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years and structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. In terms of Section 38(8) of the NHRA, before any development proposed in terms of NEMA (1998) or the MPRDA (2002) is approved, it is incumbent on the developer (or mine) to ensure that a **Heritage Impact Assessment** is done that satisfies Section 38(3) of the NHRA, should the commenting authority deem it necessary. Appropriate mitigation, which involves recording, sampling and dating sites that are to be destroyed, may be required depending on the nature and significance of the resources identified. According to the submitted Background Information Document (BID), the proposed development entails the construction of a composting site on previously disturbed agricultural fields within the town of Delmas. The composting site will be used to	Comments acknowledged and noted with thanks.

Department/ interest	Date	Method of comment	Issue raised	Response
			compost straw (broiler house litter), chicken manure, chicken mortalities, Dead-On-Arrival chickens, abattoir factory floor waste and sludge/fat. **Final Comment** It is unlikely that any significant impacts on heritage resources will result from the proposed development. Consequently, SAHRA Archaeology, Palaeontology & Meteorites (APM) Unit has no objection to the proposed development on the condition that if any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials, fossils or other categories of heritage resources are found during the proposed activities, SAHRA APM Unit (Jenna Lavin/Colette Scheermeyer 021 462 4502) must be alerted immediately, and a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation might be necessary. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	

4.3.9 Conclusions of the PPP

In conclusion, the Public Participation exercise has provided adequate information to enable an understanding of what the proposed composting activities would entail and to address the concerns and comments received during the basic assessment process.

5. NEED AND DESIRABILITY FOR THE ACTIVITY

A need and desirability for this project is evident from the following perspectives:

5.1 Developer / Applicant

The activity is the treatment of abattoir waste (fat sludge) from the AFGRI abattoirs making the waste harmless to the environment. The end-product of this composting process is a by-product organic fertiliser that can be sold to generate an additional income for AFGRI. It is the best alternative way for AFGRI to responsibly handle their hazardous abattoir waste that would normally be disposed of at the Holfontein hazardous waste disposal site.

5.2 Local community

As the composting plant will be an extension to the existing Daybreak abattoir, new permanent jobs will be established in order to ensure the project is implemented and maintained for years to come.

With all the new mining developments as well as the well established farming community (maize and vegetables) of the area, Afgri will have a healthy market for their organic fertiliser.

The mines can apply the product on their rehabilitation projects and the local vegetable farmers would be a very good offset for the produced compost.

6. IDENTIFIED ALTERNATIVES

The following definition of "alternatives" is given in the EIA Regulations of 18 June 2010: "alternatives", in relation to the proposed activity, *means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-*

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

Typically, alternative assessments are conducted to assist in comparing various projects or attributes of projects that will occur. The most critical comparison is evaluating any proposed project against the No-Go option. The alternatives assessment then considers alternatives to project site selection for the proposed development; alternatives to layout of the development; and alternatives to construction methodologies and/or materials used for the development.

The alternatives assessment was conducted using a simple cost-benefit analysis of each proposed alternative, through assessing various environmental attributes. These attributes can include physical (geology and soils, surface water quality and quantity, groundwater quality and quantity); biophysical (flora and fauna, sensitive environments); and social attributes (site of archaeological or cultural importance, land use issues, social health and welfare).

The impact of the each alternative was then evaluated in terms of whether it has a positive, negative, or no impact. In this instance, the impact is not evaluated in terms of significance but rather whether or not it will arise. Positive impacts are assigned a value of 1; no impact a value of 0; and a negative impact a value of -1.

By adding all of the attribute scores for each alternative, a suitability score is derived that indicates the preferred alternative. A total positive score indicates the project benefits outweigh the potential negative impacts, while a total negative score indicates the project environmental costs outweigh the potential benefits. Essentially, the highest scoring alternative is then carried forward for full impact evaluation.

6.1 No-Go option

The potential impact of the preferred project option on environmental and socio-economic attributes identified during the assessment phase is evaluated against the potential impact of the No-Go option on the same attributes. The summary of this assessment is provided in the table below.

Table 22: Development vs. No-Go option

Attribute	Development Option	No-go Option
Physical environment		
Air Pollution	-1	-1
Noise Pollution	-1	0
Water Quality	1	-1
Water Quantity	-1	-1
Visual Aesthetics	-1	0
Biophysical environment		
Fauna and Flora	0	0
Sensitive Environments	-1	0
Social environment		
Traffic	0	0
Impact on property values	1	0
Safety and security	1	0
National and regional economy	1	0
Infrastructure development	1	0
Total	**0**	**-3**

As can be seen in the table above, the development option (optimisation project) is preferred to the No-Go option (the current practices), as derived from comparative analysis.

6.2 Alternatives considered

6.2.1 Activity alternatives

The activity is the treatment of abattoir waste (fat sludge) from the AFGRI abattoirs making the waste harmless to the environment. The end-product of this composting process is a by-product organic fertiliser that can be sold to generate an additional income for AFGRI. It is the best alternative way for AFGRI to responsibly handle their hazardous abattoir waste that would normally be disposed of at the Holfontein hazardous waste disposal site. The disposal (no-go alternative) can no longer be regarded as a feasible alternative anymore for the following reasons:

- Disposal of hazardous waste at a licensed hazardous waste disposal site is costly and would remain to be a significant financial burden to AFGRI in terms of the amount of abattoir waste that would need to be disposed on a monthly basis. The disposal alternative already jeopardises the profitability and long-term, sustainable operation of the AFGRI abattoirs and of the permanent jobs that are created at the abattoirs and at related industries; and
- Disposal of the abattoir waste at a hazardous waste disposal site would mean that the abattoir waste cannot be processed as a marketable fertiliser. The income from this process would not be generated and the permanent jobs created at the composting facility would not exist.

6.2.2 Location alternatives

It would not be financially feasible for AFGRI to purchase a new property as they would then need to develop the entire site from scratch. From an environmental point of view this would also mean that a potentially undisturbed site would need to be developed.

At the proposed site (Daybreak Abattoir-Sundra), the proposed area of land to be utilised have historically been disturbed and existing road and other service infrastructure such as water connections can be utilised. Therefore, no other location alternative is considered for the proposed project.

7. ENVIRONMENTAL IMPACT ASSESSMENT

7.1 Aims of Environmental Impact Assessment

Potential environmental impacts (biophysical) associated with the proposed composting facility project have been identified.

The Environmental Impact Assessment (EIA) phase aims to adequately investigate and address all potentially significant environmental issues in order to provide the Mpumalanga Department of Economic Development, Environment and Tourism with sufficient information to make an informed decision regarding the proposed project.

This part of the document thus focuses on the identification of the major potential impacts the activities, processes and actions may have on the surrounding environment. It indicates the major impacts that these activities may have on the environmental components associated with the site, as required in terms of R.543 of the EIA Regulations, 2010.

The EIA aims to achieve the following:

- To provide a detailed assessment of the biophysical environments affected by the proposed project;
- To assess impacts on the study area in terms of environmental criteria; and
- To identify and recommend appropriate mitigation measures for potentially significant environmental impacts.

This Basic Assessment Report addresses the following:

- A detailed description of the proposed project;
- Detailed assessment of the impacts identified which are determined to be potentially significant;
- Recommendations regarding the mitigation of significant impacts; and
- To meet the requirements and to comply with the necessary legislation and Acts.

7.2 Environmental Impact Assessment Procedure

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation;
- Specification of the impact identification techniques;

- Criteria to evaluate the significance of impacts;
- Design of mitigation measures to lessen impacts;
- Definition of the different types of impacts (indirect, direct or cumulative); and
- Specification of uncertainties.

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed.

The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e. the source of the risk, the pathway and the target that experiences the risk (receptor). Refer to Figure 49 below for a model representing the above principle (as contained in the DWA's Best Practice Guideline: G4 – Impact Prediction).

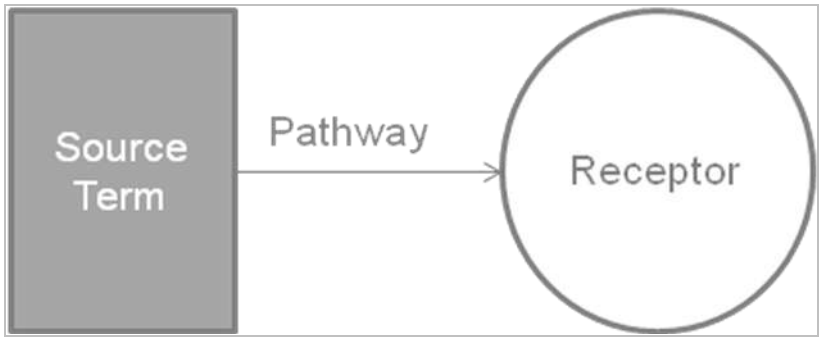

Figure 48: DWA's model for impact prediction (risk assessments)

Tables 23 and 24 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 25 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.

Table 23: Determination of Probability of impact

Frequency of Aspect / Unwanted Event	Score	Availability of pathway from the source to the receptor	Score	Availability of receptor	Score
Never known to have happened, but may happen	1	A pathway to allow for the impact to occur is never available	1	The receptor is never available	1
Known to happen in industry	2	A pathway to allow for the impact to occur is almost never available	2	The receptor is almost never available	2
< once a year	3	A pathway to allow for the impact to occur is sometimes available	3	The receptor is sometimes available	3
Once per year to up to once per month	4	A pathway to allow for the impact to occur is almost always available	4	The receptor is almost always available	4
Once a month - Continuous	5	A pathway to allow for the impact to occur is always available	5	The receptor is always available	5

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.

Table 24: Determination of Magnitude of impact

Source								Receptor			
Duration of impact	**Score**	**Extent**	**Score**	**Volume/ Quantity/ Intensity**	**Score**	**Toxicity / Destruction Effect**	**Score**	**Reversibility**	**Score**	**Sensitivity of environmental component**	**Score**
Lasting days to a month	1	Effect limited to the site (metres)	1	Very small quantities/ volumes/ intensity (e.g. <50L or <1hHa)	1	Non toxic (e.g. water)/ Very low potential to create damage or destruction to the environment	1	Bio-physical and/or social functions and/or processes will remain unaltered.	1	Current environmental component(s) are largely disturbed from the natural state. Receptor of low significance/ sensitivity	1
Lasting 1 month to 1 year	2	Effect limited to the activity and its immediate surrounding s. (tens of metres)	2	Small quantities/ volumes/ intensity (e.g. 50L to 210L or 1Ha to 5Ha)	2	Slightly toxic/ Harmful (e.g. diluted brine)/ Low potential to create damage or destruction to the environment	2	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	2	Current environmental component(s) are moderately disturbed from the natural state. No environmentally sensitive components.	2
Lasting 1 – 5 years	3	Impacts on extended area beyond site boundary (hundreds of metres)	3	Moderate quantities / volumes / intensity (e.g. > 210 L < 5000L or 5 – 8Ha)	3	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	3	Bio-physical and/or social functions and/or processes might be notably altered or enhanced/ Partially reversible	3	Current environmental component(s) are a mix of disturbed and undisturbed areas. Area with some environmental sensitivity (scarce / valuable environment etc.).	3
Lasting 5 years to Life of Organisation	4	Impact on local scale / adjacent sites (km's)	4	Very large quantities / volumes / intensity (e.g. 5000 L – 10 000L or 8Ha–12Ha)	4	Toxic (e.g. diesel & Sodium Hydroxide)	4	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	4	Current environmental component(s) are in a natural state. Environmentally sensitive environment / receptor (endangered species / habitats etc.).	4
Beyond life of Organization / Permanent impacts	5	Extends widely (nationally or globally)	5	Very large quantities / volumes / intensity (e.g. > 10 000 L or > 12Ha)	5	Highly toxic (e.g. arsenic or TCE)	5	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	5	Current environmental component(s) are in a pristine natural state. Highly Sensitive area (endangered species, wetlands, protected habitats etc.)	5

Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors above.

Table 25: Determination of Severity of impact

ENVIRONMENTAL IMPACT RATING / PRIORITY					
	MAGNITUDE				
PROBABILITY	**1 Minor**	**2 Low**	**3 Medium**	**4 High**	**5 Major**
5 Almost Certain	Medium (11)	High (16)	High (20)	Very High (23)	Very High (25)
4 Likely	Low (7)	Medium (12)	High (17)	Very High (21)	Very High (24)
3 Possible	Low (4)	Medium (8)	High (13)	High (18)	Very High (22)
2 Unlikely	Low (2)	Low (5)	Medium (9)	High (14)	High (19)
1 Rare	Low (1)	Low (3)	Medium (6)	Medium (10)	High (15)

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.

7.3 Description of Environmental Impacts

The aim of this section of this report is to provide information regarding the potential environmental impacts associated with the proposed activities. In order to provide background information and a framework for the environmental risk assessment, a description of the different phases of the project is provided below. Refer to the tables below for the impacts associated with the composting project.

7.3.1 Impacts associated with the composting facility

Table 26: Environmental impact assessment: Environment in general

Activity: Construction and operational activities at the Composting Facility.											
Aspect: Lack of environmental knowledge among employees.											
Applicable Alternatives: Preferred alternative											
Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Magnitude**	**Severity**					**Probability**	**Magnitude**	**Severity**	
Construction Phase											
Harm to the environment due to employees being unaware of how their activities may impact the environment or due to unauthorised access to the site.	5	3	20	To prevent harm to the environment through the actions of uneducated employees.	• All employees are required to attend onsite Environmental Awareness/Training prior to commencing work on site. • Follow-up Environmental Awareness/Training may be required from time to time as new employees commence work or for specific activities that may potentially impact the environment. • The facility manager is to maintain accurate records of any training undertaken. • The ECO shall monitor the facility managers' compliance with the requirement to provide sufficient environmental awareness training to all site staff. • Training is to cover all aspects of the EMP and procedures to be followed.	During construction phase, up until operation of the facility.	Facility Manager	4	2	12	NEMA, 1998 NEMWA, 2008
Operational Phase											
Harm to the environment due to employees being unaware of how their activities may impact the environment or due to unauthorised access to the site.	4	3	17p	To prevent harm to the environment through the actions of uneducated employees.	• All employees are required to attend onsite Environmental Awareness/Training prior to commencing work on site. • Follow-up Environmental Awareness/Training may be required from time to time as new employees commence work or for specific activities that may potentially impact the environment. • The facility manager is to maintain accurate records of any training undertaken. • Training is to cover all aspects of the EMP and procedures to be followed.	Life of operation	Facility Manager	4	2	12	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											

It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A

Table 27: Environmental impact assessment: Ineffective process

Activity: Operation of the Composting Facility.

Aspect: Poor facility operation, inspection, monitoring and maintenance

Applicable Alternatives: Preferred alternative

Nature and significance of environmental impact											
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Construction Phase											
Only applicable to the operational phase of the project.	N/A										
Operational Phase											
Poor operation, inspection, monitoring and maintenance may lead to process failure, compromising the production rate and quality of the compost being produced. This may lead to the buildup of organic matter (e.g. abattoir waste) and even the disposal of poor quality compost as a hazardous waste instead of being utilised as a fertiliser.	3	3	13	To ensure the compost facility operates optimally at a rate that will effectively treat/re-use the abattoir waste (fat sludge) produced at the abattoir on a continual basis.	• All pollution control dams must be regularly inspected for signs of sludge build up and HDPE liner integrity. • Water diversions should be regularly inspected for integrity to address erosion concerns that might lead to berm failure during intense rain events. • Berms should be vegetated to prevent erosion. • Compile a standard operating procedure for the composting production process based on the following key performance indicators: **Factor** / **Optimal Production Range** Temperature / 54 – 60 °C Carbon to Nitrogen ratio (C:N) / 25:1 – 30:1 Aeration, percent oxygen / > 5% Moisture Content / 50 – 60% Porosity / 30 - 36 pH / 6.5 – 7.5	Life of Operation	Facility Manager	2	3	8	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											

It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A

Table 28: Environmental impact assessment: Air quality

Activity:
- Excavation activities, increased traffic frequency and composting activities
- Commissioning of the Composting Facility
- Waste treatment through composting

Aspect:
Dust generation
Generation of odours at the composting facility

Applicable Alternatives: Preferred alternative

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Construction Phase											
Degradation of ambient air quality.	5	4	23	To minimise the impact of dust generated by the increased traffic frequency and excavation activities.	• Dust suppression must occur through watering down dusty roads. • Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. • Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. • Open areas should be ripped, if the soil is compacted, fertilised to ensure and re-vegetated as soon as possible using suitable grass species.	During construction phase, up until operation of the facility.	Facility Manager	5	3	20	NEMA, 1998 NEMWA, 2008
Potential social impact (nuisance) caused by odours generated.	5	4	23	To minimise the impact of odours created at the composting facility.	• Commercial microbial and enzyme products must be added during the commissioning phase of the compost heaps/windrows in order to promote natural decomposition of the organic matter and prevent the generation of odours. • All chemicals and detergents used at the abattoir must be compatible with the bacteria	During construction phase, up until operation of the facility.	Facility Manager	5	3	20	NEMA, 1998 NEMWA, 2008

					• used in the compost process. • Should system failure occur, a suitable starter culture or enzyme must be used to re-establish the optimal composting equilibriums.						
Operational Phase											
Degradation of ambient air quality.	4	2	14	To minimise the impact of dust generated by the turning of windrows and dumping and collection of treated material.	• Dust suppression must occur through watering down dusty working areas. • Work should seize during windy periods.	Life of Operation	Facility Manager	3	2	9	NEMA, 1998 NEMWA, 2008
Potential social impact (nuisance) caused by odours generated.	5	3	22	To minimise the impact of odours created at the composting facility.	• Commercial microbial and enzyme products must be added during the commissioning phase of the compost heaps/windrows in order to promote natural decomposition of the organic matter and prevent the generation of odours. • All chemicals and detergents used at the abattoir must be compatible with the bacteria used in the compost process. • Should system failure occur, a suitable starter culture or enzyme must be used to re-establish the optimal composting equilibriums.	Life of Operation	Facility Manager	5	3	20	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											
It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.											

Table 29: Environmental impact assessment: Noise

Activity: Excavation activities, increased traffic frequency and composting activities.											
Aspect: Generation of noise.											
Applicable Alternatives: Preferred alternative											
Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Magnitude**	**Severity**					**Probability**	**Magnitude**	**Severity**	
Construction Phase											
Disturbance and nuisance to neighbours.	5	2	19	To maintain a dB reading of less than 50dB at the site boundary.	• Regular maintenance of vehicles, back-up generators, pumps and other equipment. • All equipment and machinery should be fitted with adequate silencers.	During construction phase, up until operation of the facility.	Facility Manager	5	1	15	NEMA, 1998 NEMWA, 2008

					• Enclose machines and equipment with elevated noise emissions (in excess of 85dB) in noise reduction housing, where possible. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager. • No noisy work is to be conducted over the weekends or on public holidays.						
Operational Phase											
Disturbance and nuisance to neighbours.	5	3	22	To maintain a dB reading of less than 50dB at the site boundary.	• Regular maintenance of vehicles, back-up generators, pumps and other equipment. • All equipment and machinery should be fitted with adequate silencers. • Enclose machines and equipment with elevated noise emissions (in excess of 85dB) in noise reduction housing, where possible. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • If work is to be undertaken outside of normal work hours permission must be obtained from the ECO and the facility manager. • No noisy work is to be conducted over the weekends or on public holidays	Life of Operation	Facility Manager	4	2	14	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											
It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A										

Table 30: Environmental impact assessment: Visual

Activity: Use of night-time lighting.								
Aspect: Artificial light during night-time hours.								
Applicable Alternatives: Preferred alternative								
Nature and significance of environmental impact								
Impact Description	**Risk rating (before mitigation)**	**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**	**Applicable legislation / other documents**

	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Construction Phase											
Light pollution and nuisance.	5	2	19	To prevent the facility becoming a nuisance to adjacent landowners as a result of artificial light during the night.	• Night-time lighting must be kept to a minimum and must be switched off when not required. • Night-time lighting must be directed away from the Modderfontein road, to prevent disturbance of passing vehicles and residences. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	During construction phase, up until operation of the facility.	Facility Manager	5	1	15	NEMA, 1998 NEMWA, 2008
Operational Phase											
Light pollution and nuisance.	5	1	15	To prevent the facility becoming a nuisance to adjacent landowners as a result of artificial light during the night.	• Night-time lighting must be kept to a minimum and switched off when not required. • Night-time lighting must be directed away from the Modderfontein road, to prevent disturbance of passing vehicles and residences. • A complaints register must be kept on site. The complaints register must record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.	Life of Operation	Facility Manager	2	1	3	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											
It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A										

Table 31: Environmental impact assessment: Soil, surface water and groundwater

Activity:
• General and hazardous waste management • Rain events • Storage and handling of chemical substances • Vehicle and equipment maintenance and re-fueling • Installation and use of ablution facilities

Aspect:

- Poor waste management
- Clean' rainwater running into 'dirty' areas
- Leaking and/or spilling of fuels, greases and oils
- Unsanitary conditions on site

Applicable Alternatives: Preferred alternative

Nature and significance of environmental impact												
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Construction Phase											
Soil, surface- and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste material/compost material onsite.	5	3	22	To prevent soil, surface- and groundwater pollution and the nuisance as a result of poor waste management.	• Develop a waste management plan. • Develop a waste manifest. • Conduct waste classification of all waste used in the composting process. • The waste management plan and manifest should consider the type of waste, description, source, storage, disposal method, disposal facility and responsible person. • The implementation of the waste management plan should ensure: ➢ Installation of sufficient waste bins and skips/bulk containers where necessary. ➢ All containers (bins and skips/bulk containers) shall be kept in a clean and hygienic manner. ➢ Containers (bins and skips/bulk containers) utilised for the disposal of general and hazardous waste must be demarcated and suitably designed (e.g. prevent water ingress and contain spillages that may arise). ➢ General waste shall be stored in a manner that prevents the harbouring of pests. ➢ General waste materials should always be stored or disposed of separately from hazardous waste material (e.g. oil, diesel). ➢ General and hazardous wastes may only be disposed of at authorised facilities, and records of disposal kept. ➢ Safe disposal certificates should be requested from general and hazardous landfill sites with	During construction phase, up until operation of the facility.	Facility Manager	5	2	19	NEMA, 1998 NEMWA, 2008

					every waste dumping. ➢ These safe disposal certificates should be kept on file to illustrate compliance with the cradle to grave principle. ➢ The ECO shall monitor the compliance with the cradle to grave principle. • No incineration of any kind of waste will be permitted onsite.						
Soil and surface water pollution.	5	2	19	To prevent the contamination of 'clean' rain water by 'dirty' areas through the control of stormwater runoff.	• Clean storm water runoff from the surrounding environment must be channeled away from 'dirty' areas. The 'dirty' areas include the composting windrow area, material stockpile area, stockpiled compost (finished product), as well as chemicals storage areas and all other waste storage areas. • Storm water measures should be inspected on a regular basis in order to ensure that the structures are functional and are not causing soil erosion. • Where necessary, place culverts underneath road foundations.	During construction phase, up until operation of the facility.	Facility Manager	5	1	15	NEMA, 1998 NEMWA, 2008
Soil-, surface water- and groundwater pollution.	4	4	21	To prevent and minimise soil and water pollution as a result of poor management and accidental chemical spills.	• Identify all chemical substances. • Obtain the Material Safety Data Sheet of each of these chemical substances. • Ensure that the Material Safety Data Sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. • Develop a dangerous goods management plan based on the Material Safety Data Sheets of all identified chemical substances and the 1995 Hazardous Chemical Substances Regulations in terms of the Occupational Health and Safety Act, 1993 (Act no. 85 of 1993). • Implement a dangerous goods management plan. • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including "No Smoking", "No	During construction phase, up until operation of the facility.	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008

					Naked Lights" and "Danger", and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Chemicals are to be properly labeled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Ensure that diesel/ fuel tanks are in a bunded area with a holding capacity of 110% of the total storage volume. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemical cannot exit the designated storage area by constructing a berm / bump at the exit, or store chemicals in a spill tray. • Clean all spillage of fuels, lubricants and other petroleum based products immediately. • The contaminated material must be disposed of in accordance with the waste management procedure. • No hazardous chemical must be discarded in the sewage or storm water system. • Train staff on the use of chemicals in accordance with the risks as described in the Material Safety Data Sheets. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site.						
Hydrocarbon pollution of soils, surface- and groundwater.	4	4	21	To prevent hydrocarbon pollution of soils, surface- and groundwater.	• Inspection and maintenance of equipment, generators and vehicles shall take place on a regular basis. • Security shall inspect vehicles on entering the	During construction phase, up until operation of the facility.	Facility Manager	3	4	18	NEMA, 1998 NEMWA, 2008

					facility to ensure vehicles are in sound condition to reduce the risk of oil or diesel spillages. • Equipment, generators and vehicles are to be repaired immediately upon developing leaks. • Generators must be stored on a concrete floor in a bunded area. • Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to contain incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids.					
Potential surface- and/or groundwater- contamination.	4	3	17	Prevent soil, surface- and groundwater pollution from unsanitary conditions onsite.	• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. • Ablution facilities shall be inspected and maintained to prevent or minimise blockage and leakages. • Ablution facilities are to be serviced weekly or more frequently if required. • Toilets should have properly closing doors and be supplied with toilet paper. • Awareness of the importance of proper hygiene should be created among employees. • Ablating anywhere other than in the toilets shall not be allowed.	During construction phase, up until operation of the facility.	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008
Operational Phases											

Soil, surface- and groundwater pollution. Nuisance caused by odours and unsightly appearance of waste material/compost material onsite.	4	3	17	To prevent soil, surface- and groundwater pollution and the nuisance as a result of poor waste management.	• Conduct waste classification of all waste used in the composting process. • Continual use of the waste manifest. • Implementation of the waste management plan. • The implementation of the waste management plan should ensure: ➢ Installation of sufficient waste bins and skips/bulk containers, where necessary. ➢ All containers (bins and skips/bulk containers) shall be kept in a clean and hygienic manner. ➢ Containers (bins and skips/bulk containers) utilised for the disposal of general and hazardous waste must be demarcated and suitably designed (e.g. to prevent water ingress and contain spillages that may arise). ➢ General waste shall be stored in a manner that prevents the harbouring of pests. ➢ General waste materials should always be stored or disposed of separately from hazardous waste material (e.g. oil, diesel). ➢ General and hazardous wastes may only be disposed of at authorised facilities and records of disposal kept. ➢ Safe disposal certificates should be requested from general and hazardous landfill sites with every waste dumping. ➢ These safe disposal certificates should be kept on file to illustrate compliance with the cradle to grave principle. • No incineration of any kind of waste will be permitted onsite.	Life of Operation	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008
Soil and surface water pollution.	4	4	21	To prevent the contamination of ‘clean’ rain water by ‘dirty’ areas through the control of stormwater runoff.	• Clean storm water runoff from the surrounding environment must be channeled away from ‘dirty’ areas. The ‘dirty’ areas include the composting windrow area, material stockpile area, as stockpiled compost (finished product), as well as chemicals storage areas and all other waste storage areas. • Storm water measures should be inspected on a regular basis in order to ensure that the structures are functional and not causing soil erosion. • Where necessary, place culverts underneath road foundations.	Life of Operation	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008
Soil-, surface water- and groundwater pollution.	4	4	21	To prevent and minimise soil and water pollution as a result of poor management and accidental spills of chemical substances.	• Identify all chemical substances. • Obtain the Material Safety Data Sheet of each of these chemical substances. • Ensure that the Material Safety Data Sheets have sufficient information to enable the user to	Life of Operation	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008

					take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. • Develop a dangerous goods management plan based on the Material Safety Data Sheets of all identified chemical substances and the 1995 Hazardous Chemical Substances Regulations in terms of the Occupational Health and Safety Act, 1993 (Act no. 85 of 1993). • Implement a dangerous goods management plan. • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals are to comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Chemicals are to be properly labelled and handled in a safety conscious manner. • All personnel handling hazardous chemicals and hazardous materials are to be issued with the appropriate Personal Protective Equipment (PPE). • Ensure that diesel/fuel tanks are in a bunded area with a holding capacity of 110% of the total storage volume. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refueling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or					

					equipment. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemical cannot exit the designated storage area by constructing a berm / bump at the exit, or store chemicals in a spill tray. • Clean all spillage of fuels, lubricants and other petroleum based products immediately. • The contaminated material must be disposed of in accordance with the waste management procedure. • No hazardous chemical must be discarded in the sewage or storm water system. • Train staff on the use of chemicals in accordance with the risks as described in the material data sheets. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site.						
Hydrocarbon pollution of soils, surface- and groundwater.	4	4	21	To prevent hydrocarbon pollution of soils, surface- and groundwater by spilling of fuel, grease or oil and leaking equipment and vehicles.	• Inspection and maintenance of equipment, generators and vehicles shall take place on a regular basis. • Security shall inspect vehicles on entering the facility to ensure vehicles are in sound condition to reduce the risk of oil or diesel spillages. • Equipment, generators and vehicles are to be repaired immediately upon developing leaks. • Generators must be stored on a concrete floor in a bunded area. • Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to contain incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. • If refueling on site or from drums, the ground must be protected and proper dispensing	Life of Operation	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008

					equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids.						
Potential soil-, surface- and/or groundwater contamination.	4	3	17	Prevent soil-, surface- and groundwater pollution from unsanitary conditions onsite.	• Sufficient ablution facilities shall be provided – minimum of 1 toilet per 15 workers. • The location of toilets is to be approved by the ECO prior to site establishment, but shall be located within 100m of any work point. • Ablution facilities shall be inspected and maintained to prevent or minimise blockage and leakages. • Ablution facilities are to be serviced weekly or more frequently, if required. • Toilets should have properly closing doors and supplied with toilet paper. • Awareness of the importance of proper hygiene should be created among employees. • Ablating anywhere other than in the toilets shall not be allowed.	Life of Operation	Facility Manager	3	3	13	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											
It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A										

Table 32: Environmental impact assessment: Resource use

Activity: Usage of resources such as electricity and water.											
Aspect: Inefficient and redundant use of a valuable resource.											
Applicable Alternatives: Preferred alternative											
Nature and significance of environmental impact											
Impact Description	**Risk rating (before mitigation)**			**Environmental Objective**	**Management / Mitigation / Monitoring Measures**	**Timeframe**	**Responsibility**	**Risk rating (after mitigation)**			**Applicable legislation / other documents**
	Probability	**Magnitude**	**Severity**					**Probability**	**Magnitude**	**Severity**	
Construction Phase											
Wastage/depletion of valuable resources	4	3	17	To prevent the inefficient and redundant use of valuable resources.	**General** • Ensure that all employees have been informed on the importance of natural resources (Proper	During construction phase, up until operation of the facility.	Facility Manager	3	2	8	NEMA, 1998 NEMWA, 2008

					environmental training and awareness). • Regular site inspection by supervisors. • Inspect operations regularly to determine areas of improvement with regards to resource consumption. • Regular maintenance and inspection of equipment, such as hose pipes, to prevent leaks. • Monitoring of resource consumption. • Identify areas where resource consumption can be minimised. • Set targets to try minimise resource consumption. • Identify technologies and practices which may reduce resource consumption. • Implementation of technologies and practices which can reduce resource consumption. **Water** • Groundwater abstracted from boreholes should take place at a sustainable rate. • Regular inspection and maintenance of all boreholes, JoJo tanks, toilets, water pipes and taps. • Leaking JoJo tanks, taps, toilets and pipes are to be repaired immediately. • Running water taps and pipes may not be left unattended. • Each time you flush the toilets approximately 20 litres of water is used, therefore use the toilets accordingly. • All pipe/hose and tap connections are to be fitted with correct and appropriate plumbing fittings. **Electricity** • Save electricity by turning off lights and computers when leaving the office. • Halogen light bulbs convert approximately 80% of the energy used into heat rather than light. Replace spent light bulbs with energy saving CFLs (compact fluorescent light) or newer and more efficient LEDs (light emitting diode).						
Operational Phase											
Wastage/depletion of valuable resources.	4	3	17	To prevent the inefficient and redundant use of valuable resources.	**General** • Ensure that all employees have been informed on the importance of natural resources (Proper environmental training and awareness). • Regular site inspection by supervisors. • Inspect operations regularly to determine areas of improvement with regards to resource	Life of Operation	Facility Manager	3	2	8	NEMA, 1998 NEMWA, 2008

					consumption. • Regular maintenance and inspection of equipment, such as hose pipes, to prevent leaks. • Monitoring of resource consumption. • Identify areas where resource consumption can be minimised. • Set targets to try minimise resource consumption. • Identify technologies and practices which may reduce resource consumption. • Implementation of technologies and practices which can reduce resource consumption. **Water** • Groundwater abstracted from boreholes should take place at a sustainable rate. • Regular inspection and maintenance of all boreholes, JoJo tanks, toilets, water pipes and taps. • Leaking JoJo tanks, taps, toilets and pipes are to be repaired immediately. • Running water taps and pipes may not be left unattended. • Each time you flush the toilets approximately 20 litres of water is used, therefore use the toilets accordingly. • All pipe/hose and tap connections are to be fitted with correct and appropriate plumbing fittings. **Electricity** • Save electricity by turning off lights and computers when leaving the office. • Halogen light bulbs convert approximately 80% of the energy used into heat rather than light. Replace spent light bulbs with energy saving CFLs (compact fluorescent light) or newer and more efficient LEDs (light emitting diode).						
Decommissioning Phase											
It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A										

Table 33: Environmental impact assessment: Fauna

Activity: Growth of vegetation.
Aspect: Infestation of alien invasive vegetation

Applicable Alternatives: Preferred alternative

Nature and significance of environmental impact											
Impact Description	Risk rating (before mitigation)			Environmental Objective	Management / Mitigation / Monitoring Measures	Timeframe	Responsibility	Risk rating (after mitigation)			Applicable legislation / other documents
	Probability	Magnitude	Severity					Probability	Magnitude	Severity	
Construction Phase											
Loss of indigenous habitat and excessive water usage.	3	3	13	To control alien invasive plant species	• Ensure all alien invasive plants are identified on the site. • Ensure an eradication plan for the removal of the alien invasive vegetation is developed. • Ensure all alien invasive vegetation is removed from the site in accordance to the eradication plan. • Areas where alien vegetation was removed should be re-seeded with indigenous grasses. • Alien invasive vegetation must be eradicated and controlled by manual removal, chemical application and/or biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983 apply. • Perform a Habitat assessment study annually for three years.	During construction phase, up until operation of the facility.	Facility Manager	3	2	8	NEMA, 1998 NEMWA, 2008
Operational Phase											
Loss of indigenous habitat and excessive water usage.	3	3	13	To control alien invasive plant species	• Ensure all alien invasive plants are identified on the site. • Ensure an eradication plan for the removal of the alien invasive vegetation is developed. • Ensure all alien invasive vegetation is removed from the site in accordance to the eradication plan. • Areas where alien vegetation was removed should be re-seeded with indigenous grasses. • Alien invasive vegetation will be eradicated and controlled by manual removal, chemical application and/or biological control. The regulations in terms of the Conservation of Agricultural Resource Act, 1983, apply. • Perform a Habitat assessment study annually for three years.	Life of Operation	Facility Manager	3	2	8	NEMA, 1998 NEMWA, 2008
Decommissioning Phase											

It is highly unlikely that the composting facility will be decommissioned in the foreseeable future. However, if closure is considered, an extensive decommissioning plan (including closure and rehabilitation) will be drafted and sent to the Department prior to the event.	N/A

Refer to Part 8 below for a summary on the key findings related to the composting facility and associated infrastructure.

7.3.3 Cumulative Impacts

Cumulative impacts refer to the situation where an activity may in itself not have a significant impact, but may become significant when added to the existing and potential impacts from similar or different activities in the area.

The following potential cumulative impacts have been identified:

Table 34: Cumulative impacts

Activity	Aspect	Cumulative Aspect
Composting process	Odours caused by the composting process	Complex mixture of odours from different odour causing activities at the abattoir
Extraction of groundwater for composting process	Increased volume of groundwater being extracted for process use	The cumulative volume of extracted groundwater from all the abattoir operations combined.

8. ENVIRONMENTAL IMPACT STATEMENT

8.1 Summary of key findings

The following key findings are summarised for the proposed development.

- Potential eutrophication and salination of the pan might occur if the clean and dirty water separation is ineffective.
- Bad odours could increase, affecting the neighbours in a negative manner if the composting process is poorly managed.

9. CONCLUSION

Information has been provided to the Mpumalanga Department of Economic Development, Environment and Tourism and interested and affected parties during the draft Basic Assessment Phase. This document serves as the draft report to be considered by the registered I&APs and state departments. Should there be any comments received on this report within the notice period provided, these comments will be address in the final report that will be submitted to the competent authority, Mpumalanga Department of Economic Development, Environment and Tourism in this case, for final perusal.

This Basic Environmental Impact Assessment process has been carried out in accordance with the NEMA, 1998, and the Regulations there under.

It is concluded that the proposed development will have a positive impact on both the natural as well as the socio-economic environment of the area.

As independent Environmental Assessment Practitioners we are of the opinion that the proposed project can be rolled out and maintained for quite a number of years in a sustainable manner and will contribute to best environmental practice in a financially feasible manner.