



DRAFT BASIC ASSESSMENT REPORT

*For the proposed expansion of a piggery on Mount Ashley Farm,
on Remainder 941 of the Farm Groot Valleï near Midmar Dam,
Umngeni Local Municipality, uMgungundlovu District of KwaZulu-Natal*



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January 2019



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Acronyms

BAR	Basic Assessment Report
BID	Background Information Document
BPA	Biodiversity Priority Area
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DOT	Department of Transport
DWS	Department of Water and Sanitation
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIR	Environmental Impact Report
EKZNW	Ezemvelo KZN Wildlife
ELU	Existing Lawful Use
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
GA	General Authorization
HIA	Heritage Impact Assessment
HGM	Hydrogeomorphic
IAP	Interested and Affected Party
IDP	Integrated Development Plan
KZN	KwaZulu-Natal
IWULA	Integrated Water Use License Application
MAR	Mean Annual Runoff
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMWA	National Environmental Management Waste Act (No 59 of 2008)
NFEPA	National Freshwater Ecosystems Priority Areas
NSDP	National Spatial Development Perspective
NWA	National Water Act (No. 36 of 1998)
PA	Protected Area
PES	Present Ecological State (referring to wetland health)
QC	Quaternary Catchment
SANBI	South African National Biodiversity Institute
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SWMP	Stormwater Management Plan
WARMS	Water Authorisation and Registration Management System
WESSA	Wildlife and Environment Society of South Africa
WUL	Water Use License
WULA	Water Use License Application

Annexures

Annexure A EAP details

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- B2 Site Plan
- B3 Mount Ashley pre-application meeting minutes DEDTEA

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- F2 Background Information Document
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Annexure G Draft Environmental Management Programme

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1. OBJECTIVES OF BASIC ASSESSMENT REPORT

This report has been prepared in accordance with **Appendix 1 of GN 326, Environmental Impact Assessment (EIA) regulation 2014, amended 2017.**

The objective of the basic assessment process is to, through a consultative process –

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternative;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine –
 - a. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - b. the degree to which these impacts—
 - can be reversed;
 - may cause irreplaceable loss of resources; and
 - can be avoided, managed or mitigated; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to –
 - a. identify and motivate a preferred site, activity and technology alternative;
 - b. identify suitable measures to avoid, manage or mitigate identified impacts; and
 - c. identify residual risks that need to be managed and monitored.

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

Environmental Assessment Practitioners and Specialists involved in this EIA, do so under **Section 13 of GN 326, Environmental Impact Assessment (EIA) regulation 2014, amended 2017.**

The EAP details are as follows –

Name: Susan Machpesh (nee Carter-Brown)
Qualifications: BSc, (Equine Sci); Dip Education; BSc Hon, (Enviro Sci)
Professional affiliations: International Association for Impact Assessment
Experience at environmental assessments (years): 8 years
Role: Project Leader

Susan has been practising as an EAP for the past 7 years. She has conducted EIA's for a range of developments: housing estates, pipelines, roads, poultry houses, dairies, breaking new land and the like. This has given her a sound knowledge and understanding of the process, as well as the intricacies of different developments. Susan has attended various courses on wetland assessment (Tools for Wetland Delineation, Pretoria 2010; WET-Health; WET-EcoServices, Rhodes University 2010; WET-Health workshop, WESSA 2011). Susan manages a catchment restoration project in the upper Umzimvubu River, as funded by the Department of Environmental Affairs with Lima Rural Development Foundation. She is a member of the KZN Wetland Forum, IAIA KZN and the South African Wetland Society.

Name: Swazi Kubheka
Qualifications: BSc, MSc (Enviro Sci)
Professional affiliations: International Association for Impact Assessment
Experience at environmental assessments (years): 2 years
Role: Environmental Assessment Practitioner (EAP)

Swazi recently obtained her Master's degree, Environmental Science from the University of KwaZulu-Natal in 2018. Her research project was investigating the Incorporation of Biodiversity Recommendations into Environmental Authorisations in KZN. Swazi has planning and biodiversity conservation experience from Ezemvelo KZN Wildlife (2014-2016), under the Integrated Environmental Management (IEM) Land Use Planning Section. Swazi joined the NatureStamp team in April 2018 and is developing a specialization in environmental impact assessments, environmental management plans as well as environmental auditing, amongst other activities.

Name: Bruce Scott-Shaw

Qualifications: BSc, MSc, PhD (Hydrology)

Professional affiliations: International Association for Impact Assessment

Experience at environmental assessments (years): 5 years

Role: Watercourse Delineation; and GIS mapping




Bruce is a hydrologist, whose focus is broadly on hydrological perspectives of land use management and climate change. Throughout his university career he has mastered numerous models and tools relating to hydrology, soil science and GIS. Some of these include ACRU, SWAT, ArcMap, Idrisi, SEBAL, MatLab and Loggernet. He has some basic programming skills on the Java and CR Basic platforms. He has spent most of his spare time doing field work for numerous companies and researchers. Bruce has completed his PhD which focuses on rehabilitation of alien invaded riparian zones and catchments using indigenous trees. The aim is to select Working for Water (WfW) sites throughout the country and use micro-meteorological techniques to measure the water use of both the indigenous and alien tree species in the riparian areas. This research will assist in land rehabilitation and restoration in the highly sensitive riparian areas. A modelling approach has been incorporated into the research to improve the spatial resolution of the research and to work as a management tool. Bruce has worked on numerous projects for the CSIR and Ezemvelo KZN wildlife which has included micrometeorological work, EIAs and wetland mapping for KZN. Bruce has presented his research around the world, where most recently he represented South Africa at the Singapore International Water Week on water policy and implementation.

The abovementioned EAPs and specialists undertake under oath the following –

- (i) the correctness of the information provided in the reports;
- (ii) the inclusion of comments and inputs from stakeholders and Interested and Affected Parties (IAPs);
- (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by IAPs.

See the Declaration of independence in Annexure A2; and Annexure A1 for CV's.

Signed: 15 December 2018

 Susan Machpesh (Project Leader)	 Swazi Kubheka (EAP)	 Bruce Scott-Shaw (Specialist)
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3. SCOPE OF PROPOSED DEVELOPMENT

3.1 Project background

Mount Ashley Farm is an existing piggery, dairy and crop farm located west of Midmar Dam, near Mphopomeni in the Umngeni Local Municipality of KwaZulu-Natal; see the Google Earth image that follows.

The site is located within Quaternary Catchment U20C; falling under the uMvoti to Mzimkulu Management Area (WMA) and the uMngeni waterboard (uMngeni Water). The proposed development site is found on a small catchment area of the Umngeni River.

Currently, the proponent has a 9 house piggery production enterprise, comprising of 7000 pigs. The proposed development of the new piggery site would allow the sow breeding to be separated from the grower unit, and also allow for growth in total pig numbers. Although the proposed piggery is planned for a new site, it forms an integral part of the existing piggery enterprise. Breeding, disease control, and feeding operations, for example, would all be collectively managed across the existing and proposed new site. Thus, the proposed development of the piggery is seen as an EXPANSION activity.

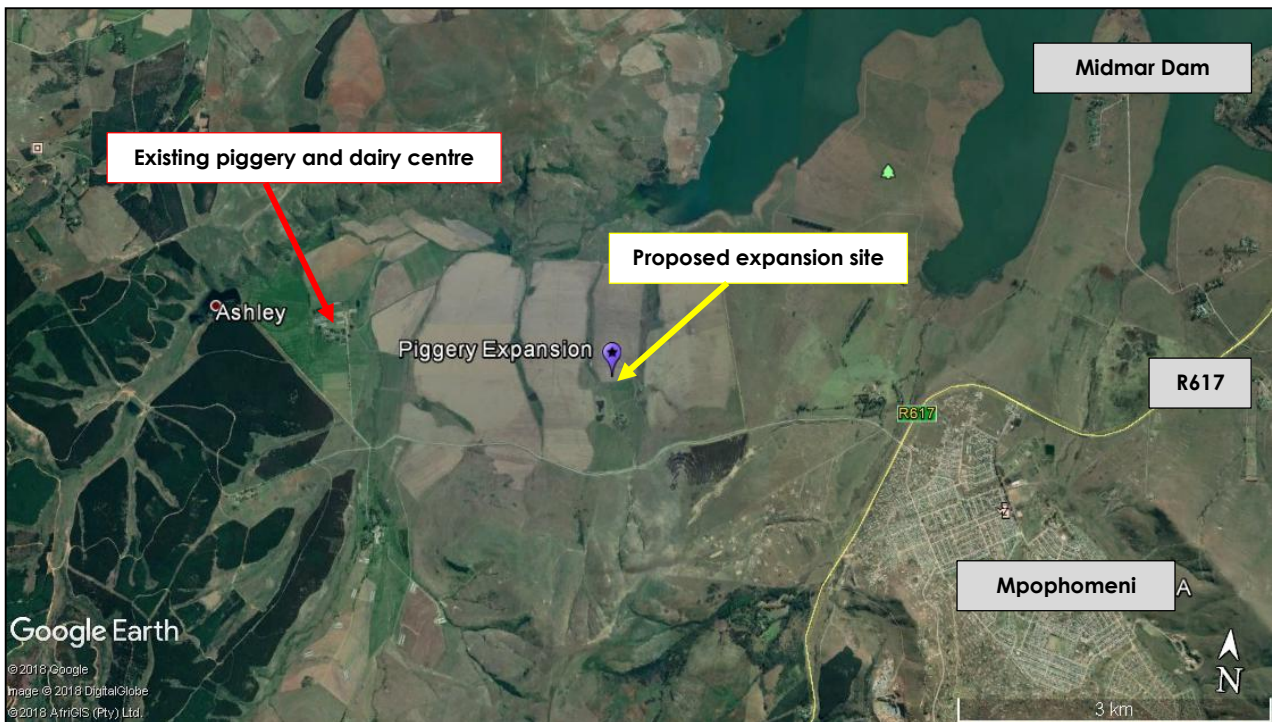


Figure 1 Google Earth image showing the proposed new site in relation to the existing piggery operation.

3.2 Proposed activity

The proponent wishes to develop a piggery breeder site on the Mount Ashley farm: Remainder 941 of Farm Groot Vallei near Midmar Dam.

The footprint of the site would be 112m x 172 m which equates to **19 262m², 1.9 ha.**

The development would take place on lands that are already cultivated.

The development would consist of **7 new houses to be developed**, allowing for an expansion that accommodates:

- 1 000 sows,
- 3 600 piglets up to 28 days,
- approximately 100 replacement gilts, and
- 10 boars.

There would be a Staff Facility associated with the piggery, which includes –

- Office;
- Showers;
- Ablutions;
- Seating area/dining area(food brought in from outside) and;
- Basic workshop, used for fixing broken pipes, pens and slats (no petrochemicals / lubricants on site).

Furthermore, there would be an Effluent Management system, which includes –

- Effluent Holding Sump (capacity 32m³);
- Separator;
- Solids bunker (capacity 20 m³);
- Effluent Lagoon (capacity 1200m³);
- Composting platform (area 200 m³); and
- Estimated average of solid waste treated per day by composting = 1 ton.

All effluent would be controlled within a contained, impermeable system, with no contaminated runoff being generated off the site. **Waste management at the existing piggery is taken care of independently to the new proposed piggery site.**

See the proposed layout in Figure 2 below. Further detailed layout plans are found in Annexure C.



Figure 2 Site layout for the proposed piggery

The development would be a modern, high technology piggery. See the pictures in Annexure C3 which show another piggery in KZN as an example of what the Mount Ashley piggery would look like.

3.3 Location of preferred site

Physical address and farm name

The project is proposed to occur on Mount Ashley Farm, Remainder 941 of Farm Groot Valle, near Mpophomeni in the Umngeni Local Municipality of the UMgungundlovu District in KwaZulu-Natal.

See the locality map in Annexure B1.

Co-ordinates

The proposed site is located at: 29° 33' 12.16" south ; 30° 08' 25.75" east.

21 digit surveyor general code

SG Key: NOFT00000000094100000

Access to the site

Access to Mount Ashley farm exists from the D174 gravel road off the R617 near Mpophomeni. There is no need for an additional access point off the Regional road.

Access to the proposed site exists via existing farm tracks. There may be construction of internal roads to the site, which are wider than 4m.

3.4 Detailed site plan

See the detailed layout in Annexure B2.

See the site photographs in Annexure C4.

See the facility illustrations in Annexure C2.

4. POLICY AND LEGISLATIVE CONTEXT

There exists several legislation in South Africa that promotes protection and sound management of the natural environment. This assessment is governed by the following legislation -

Table 1 Table outlining legislation relevant to the application

Title of legislation, policy or guideline	Administering authority	Date
National Environmental Management Act (No. 107 of 1998)	Department of Agriculture and Environmental Affairs	1998
National Environmental Management: Waste Act (No. 59 of 2008)	Department of Agriculture and Environmental Affairs	2008
National Water Act, 1998 (No. 36 of 1998)	Department of Water Affairs	1998
Integrated Environmental Management (IEM)	Department of Environment and Agriculture	2002
South Africa's Constitution (No. 108 of 1996), including the Bill of Rights (Chapter 2, Section 24)	The State	1996
Hazardous Substances Act (No 15 of 1973)	Various Departments	1973
National Environmental Management: Biodiversity Act, 2004 (No.10 of 2004)	Department of Agriculture and Environmental Affairs & Ezemvelo KZN Wildlife	2004
Atmospheric Pollution Prevention (No. 45 of 1965)	Department of Agriculture and Environmental Affairs	1965
Health Act (No 63 of 2003)	Department of Health	2003
Conservation of Agricultural Resources Act, 1983 (No. 43 of 1983)	Department of Agriculture, Forestry and Fisheries	1983
Animal Health Act (No. 7)	Department of Veterinary Health	2002
Publication of Need and Desirability Guideline in terms of the Environmental Impact Assessment Regulations, 2010 (GNR 792 of 2012)	Department of Environmental Affairs	2012
uMngeni Municipality Integrated Development Plan, 2011/18-2021/22	Department of Environmental Affairs	2018
National Spatial Development Perspective, 2006	The Presidency of South Africa	2006
KwaZulu-Natal Provincial Growth and Development Strategy	KZN Provincial Planning Commission	2014
UMgungundlovu District Municipality SEA	UMgungundlovu District	2013

This section gives a description of the policy and legislative context within which the development is located, as well as an explanation of how the proposed development complies with and responds to the legislation and policy context.

4.1 National Environmental Management Act (No 107 of 1998, NEMA)

NEMA is South Africa's overarching environmental legislation and has, as its primary objective, to provide for co-operative, environmental governance by establishing: principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state, and to provide for matters connected therewith.

The principles of the Act focus on providing for people's basic needs in a socially, economically and environmentally sustainable manner. Environmental management aims to satisfy people's needs by acknowledging that all elements of the environment are linked and interrelated. Environmental responsibility and justice for harmful activities is pursued as a vital component to effective environmental management.

The activities required for the development of a piggery have the potential to cause detrimental impacts on the environment and hence trigger the following activities under the EIA Regulations 2014, amended 2017 -

Table 2 Listed Activities

Relevant GN and activity	Description of listed activity	Relevance to the project
<p>NEMA, EIA Regulations 2017 GNR 327</p> <p>Activity 4.</p>	<p><i>"The <u>expansion and related operation of facilities for the concentration of animals in densities that exceed—</u></i></p> <p><i>(i)20 square metres per large stock unit and more than 500 units per facility;</i></p> <p><i>(ii) 8 square meters per small stock unit and;</i></p> <p><i><u>a. more than 1 000 units per facility excluding pigs where (b) applies; or</u></i></p> <p><i><u>b. more than 250 pigs per facility excluding piglets that are not yet weaned;</u></i></p> <p><i>(iii)30 square metres per crocodile and more than 20 crocodiles per facility;</i></p> <p><i>(iv)3 square metres per rabbit and more than 500 rabbits per facility; or</i></p> <p><i>(v) 250 square metres per ostrich or emu and more than 50 ostriches or emus per facility."</i></p>	<p>The proposed piggery unit would house a maximum of 4610 pigs at any one time.</p>
<p>NEMA, EIA Regulations 2017 GNR 324</p> <p>Activity 2.</p>	<p><i>"The development of <u>reservoirs excluding dams, with a capacity of more than 250 cubic metres.</u></i></p> <p><i>d. KwaZulu-Natal</i></p> <p><i>xii. Outside urban areas:</i></p> <p><i>(aa) Areas within 10 kilometres from national parks or world heritage sites or <u>5 kilometres from any terrestrial protected area</u> identified in terms of NEMPAA or from the core area of a biosphere reserve;</i></p>	<p>The Effluent Lagoon would have a capacity of 1200 cubic metres.</p> <p>The site neighbours the Midmar Dam Nature Reserve Protected Area.</p>
<p>NEMA, EIA Regulations 2017 GNR 324</p> <p>Activity 4.</p>	<p><i>"The development of a <u>road wider than 4 metres with a reserve less than 13,5 metres.</u></i></p> <p><i>d. KwaZulu-Natal</i></p> <p><i>i. In an estuarine functional zone;</i></p> <p><i>xii. Outside urban areas:</i></p> <p><i>(aa)Areas within 10 kilometres from national parks or world heritage sites or <u>5 kilometres from any terrestrial protected area</u> identified in terms of NEMPAA or from the core areas of a biosphere reserve;</i></p>	<p>There would be internal roads and turning circles developed to allow access to the new piggery.</p> <p>The site neighbours the Midmar Dam Nature Reserve Protected Area.</p>

Therefore, a Basic Assessment Report (BAR) EIA process is required. The EIA would identify the potential environmental impacts, assess their significance, and offer mitigation measures to render impacts acceptable and/or sustainable. The BAR serves as an application to the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) for the Environmental Authorization.

The DEDTEA advised that this application be considered an expansion activity due to there being an existing operating piggery on the Mount Ashley farm (Portion 2 of Ashley 947, see figure 1). The new piggery site would form a breeder unit, and would work in conjunction with the existing piggery where the weaners and growers would be housed. Thus, even though the proposed new infrastructure would be separate to the existing site, the operational aspect of moving pigs between the two units makes this an expansion activity (see DEDTEA pre-application minutes, Annexure B3).

4.2 National Environmental Management: Waste Act (No 59 of 2008, NEMWA)

The specifications of the Effluent Management system are as follows –

- Effluent Holding Sump (capacity 32 m³);
- Separator;

- Solids bunker (capacity 20 m³);
- Effluent Lagoon (capacity 1200m³);
- Composting platform (area 200 m³); and
- Estimated average of solid waste treated per day by composting =1 ton.

The following listed activities under the NEMWA (GN 921) are relevant –

Category A (1): *“The storage of general waste in lagoons”.*

→ This does not apply to animal effluent, therefore, it is the opinion of the EAP that this activity is not triggered.

Category A (6): *“The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons”.*

→ One ton of solid waste is composted per day, therefore, it is the opinion of the EAP that this activity is not triggered.

Category C (1): *“The storage of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoon or temporary storage of such waste”.*

→ Waste is temporarily stored in the Effluent Holding sump and Effluent Lagoon, therefore it is the opinion of the EAP that this activity is not triggered.

Confirmation from the Pollution and Waste Management Unit (DEDTEA) is required.

4.3 National Water Act (No. 36 of 1998, NWA)

The NWA aims to develop the major legislation regarding the efficient and sustainable use of water resources. The purpose of the Act is stated in Section 2 as:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

The proponent must consider these aspects and ensure that the development of the piggery is in the best interest of all parties. It is therefore important to conduct watercourse studies to determine the effects that will be felt by surrounding parties, currently and in the future, as well as the impacts that will be placed on the environment.

Section 21 of the NWA lists water use activities that either have Existing Lawful Use, can be Generally Authorised or require a Water Use License (WUL). The relevance of these water use activities to the proposed development are provided in the table below.

Pig effluent is classified as **“biodegradable industrial wastewater: wastewater that contains predominately organic waste, arising from (industrial activities) and premises, including – confined animal feeding operations”.**

Table 3 Water use activities and relevance to the site

	Water use activity	Potential relevance to project
S21 (a)	taking water from a water resource;	N / A
S21 (b)	storing water;	N / A
S21 (c)	impeding or diverting the flow of water in a watercourse;	Development within 500m of a wetland
S21 (d)	engaging in a stream flow reduction activity (currently only commercial afforestation);	N / A
S21 (e)	engaging in a controlled activity - activities which impact detrimentally on a water resource (activities identified in section 37(1) or declared as such under section 38(1); namely – <ul style="list-style-type: none"> • Irrigation of any land with waste or water containing waste which is generated through an industrial activity or a waterworks; • An activity aimed at the modification of an atmospheric precipitation; • A power generation activity which alters the flow regime of a water resource; or • Intentional recharge of an aquifer with any waste of water containing waste 	Irrigation with liquid effluent
S21 (f)	discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;	N / A
S21 (g)	disposing of waste in a manner which may detrimentally impact on a water resource;	N / A
S21 (h)	disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process;	N / A
S21 (i)	altering the bed, banks, course or characteristics of a watercourse;	Development within 500m of a wetland
S21 (j)	removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; an	N / A
S21 (k)	using water for recreational purposes.	N / A

Water use activities c) and i), speak to development within a 'regulated area of a watercourse', which is described as (GN 509, August 2016) –

- The outer edge of the 1:100 year floodline and/or delineated riparian habitat whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- In the absence of a determined 1:100 year floodline or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or
- A 500m radius from the delineated boundary (extent) of the wetland or pan.

The proposed development site is within 500m of a wetland. Thus, a Risk Assessment is required to determine the risk of the proposed development on the wetland system. If Low Risk, General Authorization (GA) of the water use activities will be permissible. If Moderate to High risk, a WUL is required.

The irrigation with liquid effluent is proposed under GA, in accordance with the regulations of GN 665 (2013).

The Department of Water and Sanitation (DWS) will be engaged further through the EIA process.

4.4 The Constitution of South Africa

Section 24 of the Constitution of South Africa (No. 108 of 1996) states that -

"...everyone has the right ...

- a) to an environment that is not harmful to their health or well-being; and
- b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that ...

- c) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

This protection involves preventing pollution and promoting conservation and environmentally sustainable development. Consulting the Constitution of South Africa ensures that both people and the environment they reside in are considered in the development proposal, and can therefore be adequately protected.

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa and given effect by NEMA (1998) states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations. Sustainable development requires a cautious approach to economic development that includes the protection of biological biodiversity as well as the prevention of pollution, waste and degradation within ecosystems and the natural environment.

The fact that it is the constitutional right of every South African citizen to have a healthy environment gives strength to environmental legislative framework. It is thus extremely important to ensure that the environment is taken into consideration during the development of Mount Ashley piggery.

4.5 National Heritage Resources Act (No. 25 of 1999, NHRA)

Section 38 of the South African NHRA lists various categories of development which prompts the need for a comment or decision from the Provincial Heritage Agency, Amafa KwaZulu-Natali. The legislation requires that a developer informs Amafa when a listed development occurs and obtains written approval / comment from Amafa as required.

The Section 38 categories are as follows –

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which **will change the character of a site —**
 - (i) **exceeding 5 000m² in extent**; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (c) the re-zoning of a site exceeding 10 000 m² in extent; or
- (d) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Due to the fact that the proposed piggery would exceed 5 000 m² in extent, and may change the character of the site, it is necessary to submit the application to Amafa via the SAHRIS website.

Amafa KwaZulu-Natal Heritage Council have been invited to provide comment in this application and guide any permitting process which may be required.

In this regard, a Need and Desirability application (Form J) has been submitted to Amafa and the application fee has been paid (see Annexure H5).

4.6 The KwaZulu-Natal Heritage Act (No.4 of 2008)

In terms of chapter 8 and 9 of the Act, the following heritage resources require approval from the Amafa KwaZulu-Natal Heritage Council before being altered in any way:

- Structures older than 60 years;
- Graves of victims of conflict;

- Traditional burial places;
- Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites;
- Heritage and Provincial Landmark sites;
- Graves of members of the Royal Family;
- Public monuments and memorials.

None of the abovementioned features are found on the proposed site. Therefore, a Heritage Impact Assessment, nor approval from Amafa (in this regard) is required.

5. GUIDELINES AND SPATIAL PLANS

5.1 National Freshwater Ecosystem Priority Areas (NFEPA, 2011)

The NFEPA project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. Wetlands in South Africa have been mapped on a broad-scale by various stakeholders and are used in the NFEPA project to identify priority wetland ecosystem areas and ensure their protection and sustainable use. NFEPA notes that upstream human activities need to be managed to prevent the degradation of downstream Freshwater Ecosystem Priority Areas (FEPAs) and Fish Support Areas.

5.2 EKZNW Biodiversity Planning Tool

Minset is a function or tool with Conservation Planning Software that is used to identify a minimum set of sites that would fulfil the aim firstly of achieving the conservation targets within a number of constraints that can be set by the user. It presents the most efficient solution to achieving conservation targets within other land use constraints. The Minset output map shows areas that are already protected as Mandatory Reserves (totally irreplaceable) and Negotiable Reserves (most efficient for achieving targets and constraints).

For this project, the EKZNW Minset function was taken into consideration (see Annexure H3).

5.3 Integrated Development Plan

An Integrated Development Plan (IDP) is a five-year plan which local government is required to compile to determine the development needs of the municipality. The projects within the IDP are linked to the municipality's budget. The IDP should be reviewed annually; it does not only determine the status of the identified projects for the previous year but also whether the remaining projects are still relevant and priority.

The review process in formulating an IDP incorporates public participation, which gives citizens opportunity to highlight and prioritise their development needs. The municipality encourages citizens to participate in IDP meetings to ensure that their needs are made known. Citizens can also communicate via their Ward Committees and Ward Councillors.

For this project, the Umngeni Municipality IDP (2017/18-2021/22, Annexure H2) was followed.

5.4 Spatial Development Framework

A SDF is a framework that seeks to guide, overall spatial distribution of current and desirable land uses within a municipality in order to give effect to the vision, goals and objectives of the municipal IDP. The aims of a SDF are to promote sustainable functional and integrated human settlements, maximise resource efficiency, and enhance regional identity and unique character of a place

For this project, the Umngeni Municipality SDF (2016/17, Annexure H1) was followed.

5.5 Environmental Management Framework

An Environmental Management Framework (EMF) is the study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land-uses may be best practised and to offer performance standards for maintaining appropriate use of such land.

For this project, the UMgungundlovu EMF (2013) was followed.

6. CONSIDERATION OF ALTERNATIVES

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity. Several alternatives are addressed below, in relation to the proposed dam development.

Alternatives should be feasible and reasonable.

6.1 Alternative sites / location

Three alternative sites have been assessed, as follows –

→ **Preferred Site**, found at geographical co-ordinates 29° 33' 12.16" S; 30° 08' 25.75" E.

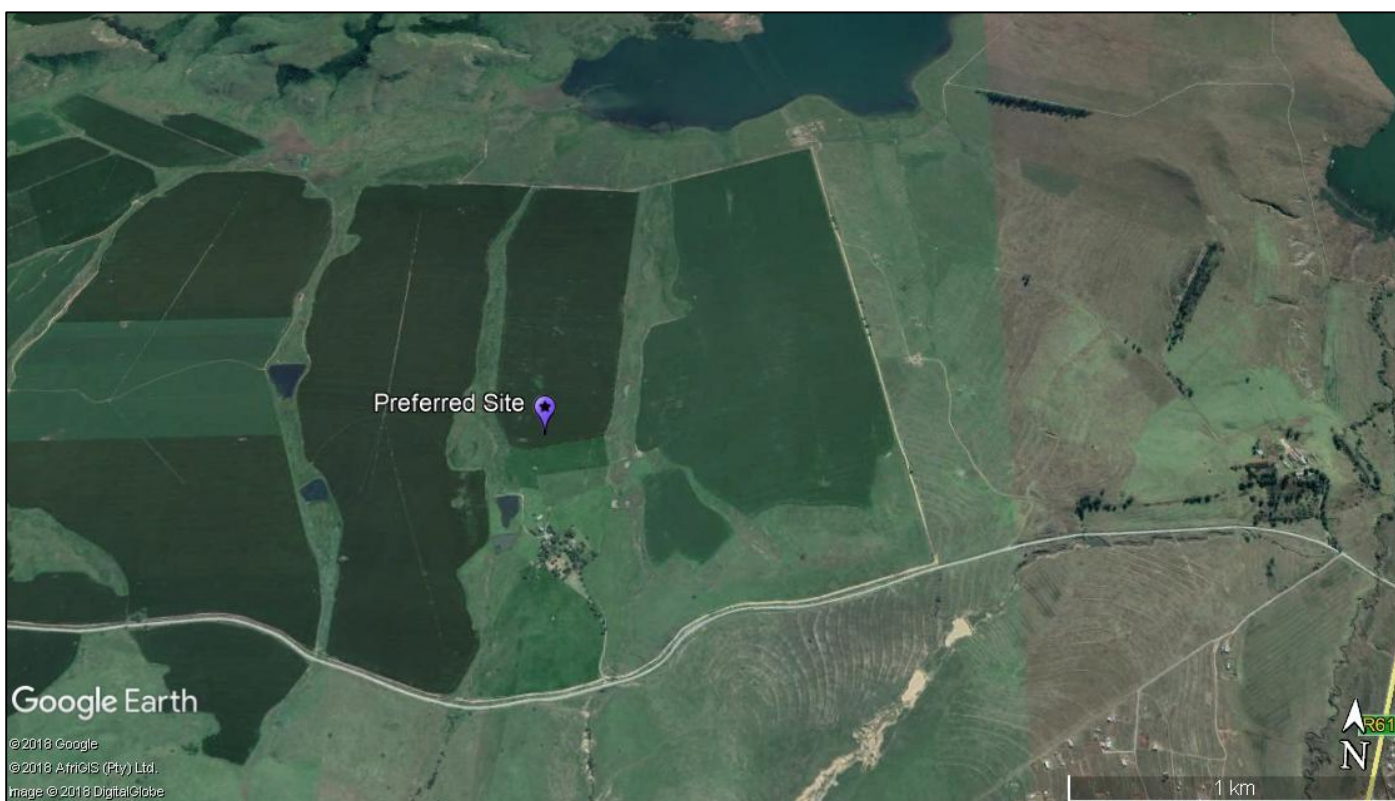


Figure 3 Google Earth image showing Preferred site

→ **Alternative 1: Addition to existing piggery site**, found at geographical co-ordinates 29°32' 57.73 S; 30° 06' 41.60" E.



Figure 4 Google Earth image showing Alternative 1

→ **Alternative 2: Site next to main road**, found at geographical co-ordinates 29° 33' 46.15 S; 30° 07' 9019" E.



Figure 5 Google Earth image showing Alternative 2



Figure 6 Google Earth image showing all sites assessed

The environmental and socio-economic attributes of each alternative site were considered, as well as risks and cumulative impacts of each. The table that follows summarises the findings of these deliberations -

Table 4 Summary of attributes of alternative sites

	Advantages	Disadvantages
Preferred Site	<p>Adequate distance from existing piggery - improved biosecurity: breeders / weaners</p> <p>Close to water source (existing dam)</p> <p>Close to power source (ESKOM transformer)</p> <p>Close to existing irrigation scheme and cropping lands – for effluent irrigation</p> <p>Good security / surveillance: close proximity to proponent's house</p> <p>Management: close proximity to proponent's house</p> <p>Good access, mostly existing</p> <p>Transformed lands</p>	<p>Proximity to Midmar Dam – within viewshed of Hoby Point; concerns regarding impact on Midmar water quality</p> <p>Non-perennial watercourses either side of development (over 100m)</p>
Alternative site 1 (Addition to existing piggery unit)	<p>Existing facility – water, food, electricity, impact</p> <p>Existing access</p> <p>Outside of Midmar Dam viewshed</p>	<p>Biosecurity problem: breeders in proximity to growers</p> <p>Additional effluent generated (from new piggery) would need to be transported to cropping lands further afield</p>
Alternative site 2 (Next to main road)	<p>Adequate distance from existing piggery - improved biosecurity: breeders / weaners</p> <p>Outside of Midmar Dam viewshed</p>	<p>Site is untransformed grasslands – development would require loss of grassland.</p> <p>No power source in close proximity</p>

		<p>No water source in close proximity</p> <p>Would require use of the neighbour's driveway thus disturb the neighbouring property.</p> <p>Proximity to watercourse</p> <p>Outside of security fence.</p> <p>Closer proximity to neighbours (fly and odour issue)</p>
Conclusion	<p>The key driving factors for the Preferred site are as follows –</p> <ul style="list-style-type: none"> • Biosecurity • Security / management • Effluent management: access to cropping lands • Transformation of land 	<p>Disadvantages associated with the Preferred site can be mitigated (see later in report).</p>

6.2 Alternative activity

The proponent is in the business of pig production. There is an existing piggery on the farm; the proponent wishes to increase pig production, and separate breeder and grower piggery units. The proposed activity aligns with the agricultural zoning of the area.

Thus, no other activity would be reasonable / appropriate and will henceforth not be considered.

6.3 Alternative design / layout

The piggery unit has been designed according to industry best practice to allow for optimal resource efficiency (both environmental and human) as well as optimal animal wellbeing. The site for the facility has been selected with input from the EAP and engineer to allow sufficient buffers to sensitive environments and for least impact on the surrounding area.

Thus, no other design / layout would be appropriate and will henceforth not be considered.

6.4 Alternative technology

The piggery unit has been designed according to industry best practice to allow for optimal resource efficiency (both environmental and human) as well as optimal animal wellbeing. The facility proposed on Mount Ashley is in line with South African and European industry best practice; it is a robust and energy efficient design. The piggery would be designed using the latest in piggery and waste technology. See examples of an existing modernized piggery in Annexure C3.

Thus, no other technology would be appropriate and will henceforth not be considered.

6.5 No-Go Alternative

The proponent has shown good agricultural practices on Mount Ashley Farm to date; with the current application showing that there is the same intent to conduct environmentally-sound practice.

Should the development not proceed, there following losses would ensue –

- No improved efficiencies of pork production on the farm;
- No further jobs (direct and indirect) created as a result of the piggery;
- Current piggery would be closed down as it will be too expensive to modify for little improvement in production due to disease pressures of having breeding stock and followers on one site;
- 12 current jobs would be lost immediately;

- No enhancement of crop production through the use of piggery effluent.
- No enhancement of animal welfare through the introduction of group sow housing.

7. NEED AND DESIRABILITY

In this section, a motivation for the need and desirability for the proposed development is given, including the need and desirability of the activity in the context of the preferred development footprint within the approved site (as contemplated in the accepted scoping report).

7.1 Need and desirability for the proposed development

The strategic context for informing need and desirability is best addressed and determined during the formulation of the sustainable development vision, goals and objectives of Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) during which collaborative and participative processes play an integral part, and are given effect to, in the democratic processes at local government level (reference - GNR 891 of 2014; Guideline on Need and Desirability in terms of the Environmental Impact Assessment Regulations, 2010).

The need and desirability of development must be measured against the contents of the IDP and SDF for the area, and the sustainable development vision, goals and objectives formulated in, and the desired spatial form and pattern of land use reflected in, the area's IDP and SDF respectively.

The proposed development site at Mount Ashley is on cultivated land which has been identified by the Umngeni Municipality IDP (2017/18-2021/22) as having moderate arable land potential. The UMgungundlovu District Municipality (UMDM) Strategic Environmental Assessment (SEA, page 40) outlines that one of the main environmental management challenges in the district is progressive loss of agricultural land to different forms of non-agriculture development (see Annexure H4), the proposed expansion of the existing piggery is an agricultural practice – and would be contributing to the combating of this challenge.

The SDF seeks to guide the overall spatial distribution of current and desirable land uses within the municipality and provides a broad indication of where different types of development should take place within the municipal area. Mount Ashley is located within 5km of the Midmar Dam Protected Area however, it is not within an area of conservation significance according to the MINSET plan (Annexure H3). The proponent has placed the proposed expansion unit within an already transformed area on the site. The EAP, wetland specialist and engineer have addressed potential pollution issues in the design and layout of the facility as well as irrigation controls, ensuring any potentially negative impacts are mitigated.

Commercial agriculture is a key economic sector in the uMgungundlovu District and is listed in the IDP as one of the five critical contributors to the District's net Gross Domestic Product. Page 75 of the IDP (2018) asserts that *"...The District enjoys a competitive advantage in the field of agriculture as the SDF shows that a large portion of the land falls into the high/good and relatively good potential for agriculture. This, coupled with the abundance of water resources in the form of six significant rivers and five major dams, puts uMgungundlovu into the country's top bracket for agriculture yield potential"* (see Annexure H4).

The Mount Ashley development expansion aims to preserve the value of the environmental assets on the farm whilst simultaneously capitalising on its potential to yield productive agricultural benefits. Sense of Place would in no way be altered.

The new development would allow for group housing of sows during their gestation cycle, as opposed to housing in sow crates. This is a marked improvement in terms of animal welfare and is in line with international best practise.

Benefits that the activity will have for society in general:

- Adherence to municipal planning guidelines; development of the region consistent with the expected trends and strategic objectives of the municipality;
- Increase in pork products for the market;
- Decreased biosecurity risk, allowing for reduced use of antibiotic use on pigs;
- Alternative source of protein for the market;

- Utilization of pig manure as organic fertilizer – decreased reliance on commercial synthetic fertilizers and improved food energy cycles;
- Improved animal welfare for sows;
- No new transformation of land;
- Biophysically, economically and socially sustainable agriculture, resulting in improved likelihood of sustained agricultural land use for long term food security.

Benefits that the activity will have for the local communities where the activity will be located:

- Approximately 15 temporary employment opportunities would be created during construction, of which all the unskilled labour required would be sourced from local previously disadvantaged communities;
- Increased direct job opportunities on farm to 5 fulltime positions when operational;
- Healthy and hygienic work environment for piggery and crop workers;
- Ancillary development within agricultural sector - electricians, consultants, meat inspectors, vets, transport, feed, etc.;
- Not less than minimal wage (likely to be more) for staff, improving the per capita earnings and benefitting the broader community.

In terms of socioeconomic aspects:

- The anticipated CAPEX value of the project (specifically the value of the dam) upon completion equates to **R40 to 50 million**.
- The expected annual turnover to be generated by or as a result of the project equates to **R58 million**.
- **20 new skilled** employment opportunities would be created during the construction phase
- **40 new unskilled** employment opportunities would be created during the construction phase
- **3 new skilled** employment opportunities would be created during the operational phase
- **5 new unskilled** employment opportunities would be created during the operational phase
- The expected value of the additional employment opportunities created during the operational and construction phases equates to approximately R136 000 per month.

7.2 Need and desirability for the preferred location

See Section 6.1 and table 4.

8. SPECIALIST IMPACT ASSESSMENT

8.1 Watercourse Delineation

Specialist: Bruce Scott-Shaw

Qualifications: Phd, MSc, Hydrology

Company: NatureStamp (Pty) Ltd

Date of Assessment: October 2018

For full report, see Annexure: D1

A desktop watercourse delineation was undertaken for the proposed piggery development.

The site is located within Quaternary Catchment U20C; falling under the uMvoti to Mzimkulu Management Area (WMA) and the uMgeni waterboard (uMgeni Water). The proposed area sits on a small catchment area of the Umgeni river (FEPA class C: Moderately Modified).

In accordance with the NFEPA guidelines, the relevant reach of the small tributaries on-site (and its associated riparian areas) has not been classified as a FEPA, which indicates that this river system is not a national freshwater conservation priority.

However, some wetlands (valley bottom) associated with this watercourse have been classified as FEPA systems. The valley bottom wetland associated with the tributary has been classified as a FEPA (PES Class C – Moderately Modified), which indicates that this river system is a national freshwater conservation priority. The

layer codes for River FEPAs and associated sub-quaternary catchments, Fish Support Areas and associated sub-quaternary catchments and Upstream Management Areas.

The site consists of areas of hydrological interest and these areas have been digitized. The site consisted of the following hydro-geomorphic units:

- Seepage wetlands;
- Channelled valley bottom wetlands;
- Un-channelled valley bottom wetlands;
- Numerous farm dams; and
- Some canals to drain return irrigation water back to the drainage areas.

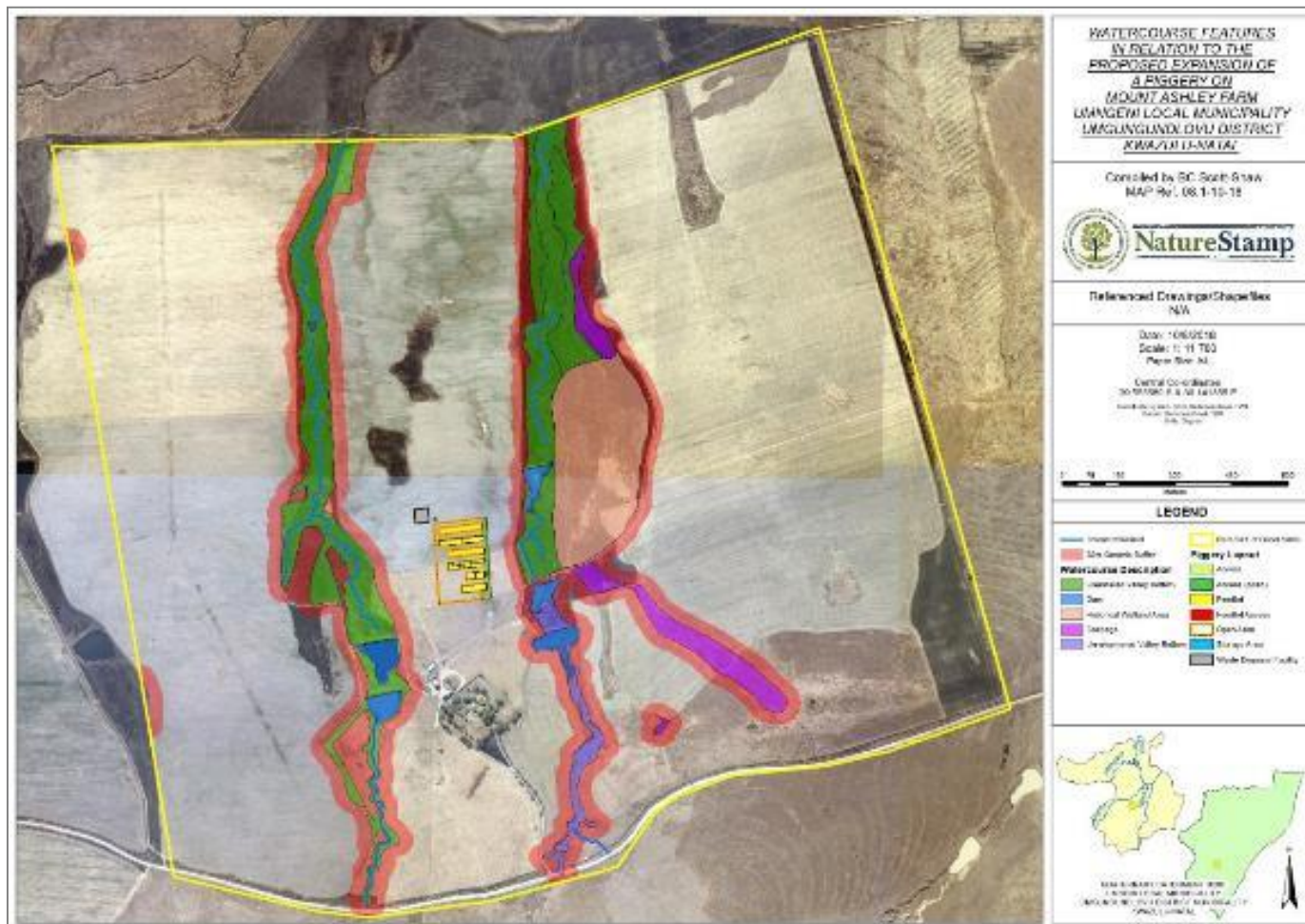


Figure 7 Watercourse delineation showing HGM units

The key findings and recommendations from the watercourse delineation are as follows -

- The wetland area has previously been identified as a wetland FEPA. FEPAs are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources; the systems need to stay in a good condition to manage and conserve freshwater ecosystems, and to protect water resources for human use. A generic 'no development' buffer of 100m is applied to FEPA systems.

→ The proposed site is more than 100 meters away from these identified systems.

- A series of modified wetlands were identified within 500 meters of the proposed site. These wetlands have been afforded a 32m buffer.

→ The current development layout is outside of the buffers zones.

- All effluent generated from the piggery should be managed and processed outside of designated buffer zones. This includes separation, temporary storage, spreading of solids and irrigation of liquid effluent.

→ See section 1.2 for proposed effluent management details.

8.2 Water Samples

Laboratory: Talbot and Talbot

Date of Assessment: 02 November 2018

For full report, see Annexure: D2

A water sample was taken from head of Midmar Dam (as indicated by asterisk 1 in figure 11). The following parameters were measured-

- Ammonia
- Chemical Oxygen Demand (Total)
- Potassium
- Total Nitrogen
- Total Phosphorus
- Nitrate/Nitrite
- Orthophosphate
- Suspended Solids at 105°C

See the results of the sample in Annexure D2.

The key findings were that currently the nutrient loads emanating from the farm are very low.

9. COMPLETE IMPACT ASSESSMENT

9.1 Solid waste

During construction

Approximately 10m³ of construction waste would be generated per month.

It would be collected in a combination of skips and waste receptacles located on-site.

The following conditions would be adhered to -

- Private construction contractors must provide proof of appropriate landfills used, and these records would be kept on file by the proponent.
- Skips and waste receptacles would be located on site in designated storage / collection areas prior to being safely disposed of and would not cause any surface and groundwater pollution, or pose any health hazards.
- All waste material generated would be disposed of at the Umngeni Municipality permitted landfill (Curry's Post) that is authorized to accept such waste. Safe disposal certificates would be kept on record.
- If contaminated soil or other hazardous materials required disposal (unlikely), a private waste management service provider would be contacted (e.g. Enviroserv).

Recycling of suitable materials would be undertaken as appropriate.

During operation

The waste generated during operations includes-

- i) dead pigs, and
- ii) used medicinal materials (vaccinations / artificial insemination straws).

Feed is generally purchased in bulk (no bags) or bags are sent back to supplier.

These waste streams must be managed as follows –

- i) Dead pigs –

A maximum of 2 sows die / month = 24 sows / year.

Weight of sow = approx. 150kg each

Approximately 100 piglets die /month = 1200 piglets / year

Weight of piglet = approx. 2kg each

Total of dead pigs = 1225 dead animals / year.
= 6000 kg animal carcass / year

The dead pigs would be disposed of via composting.

The carcasses would be included into the effluent solids composted manure where rapid decomposition takes place over a period of 6 weeks.

ii) Medicinal waste –

General waste (packaging / plastics) would be recycled or disposed of with general farm waste (landfill / buried).

Old vaccination vials and syringes would be disposed of into a designated container, and returned to the veterinary wholesaler for safe disposal.

There must be no medicinal waste entering the effluent management system.

9.2 Effluent

During construction

An appropriate number of temporary, chemical toilet facilities (at least 1 toilet for every 20 workers) would be provided for labourers during the construction Phase. These would be maintained in a satisfactory condition and must be positioned a minimum of 100m away from any water resources. The toilet service provider would be responsible for taking away and disposing of the toilet waste, as consistent with their respective Waste Management License.

The EMPr and subsequent ECO monitoring would check that no form of secondary pollution would arise from the disposal of refuse or sewage from the construction toilets.

During operation

The effluent generated during operation consists of the following –

- i) Effluent from staff facilities, including laundry, showers, ablutions and kitchen;
- ii) Effluent from pigs (water, urine, manure) –

The proposed site layout is seen in the figures below.

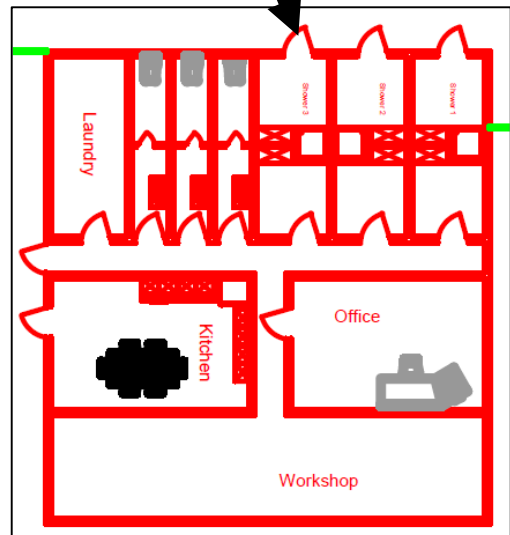
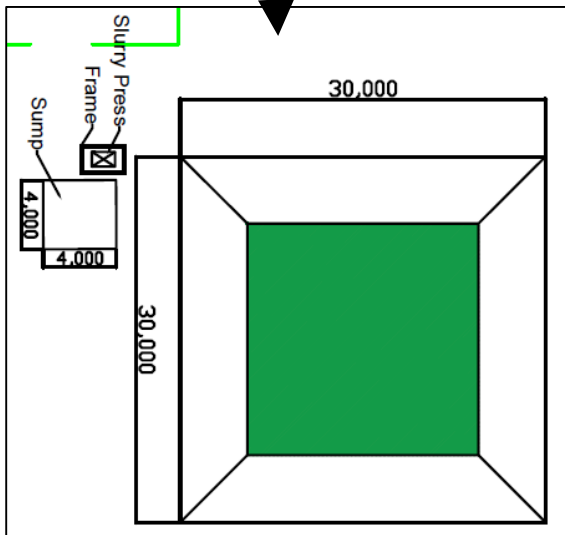
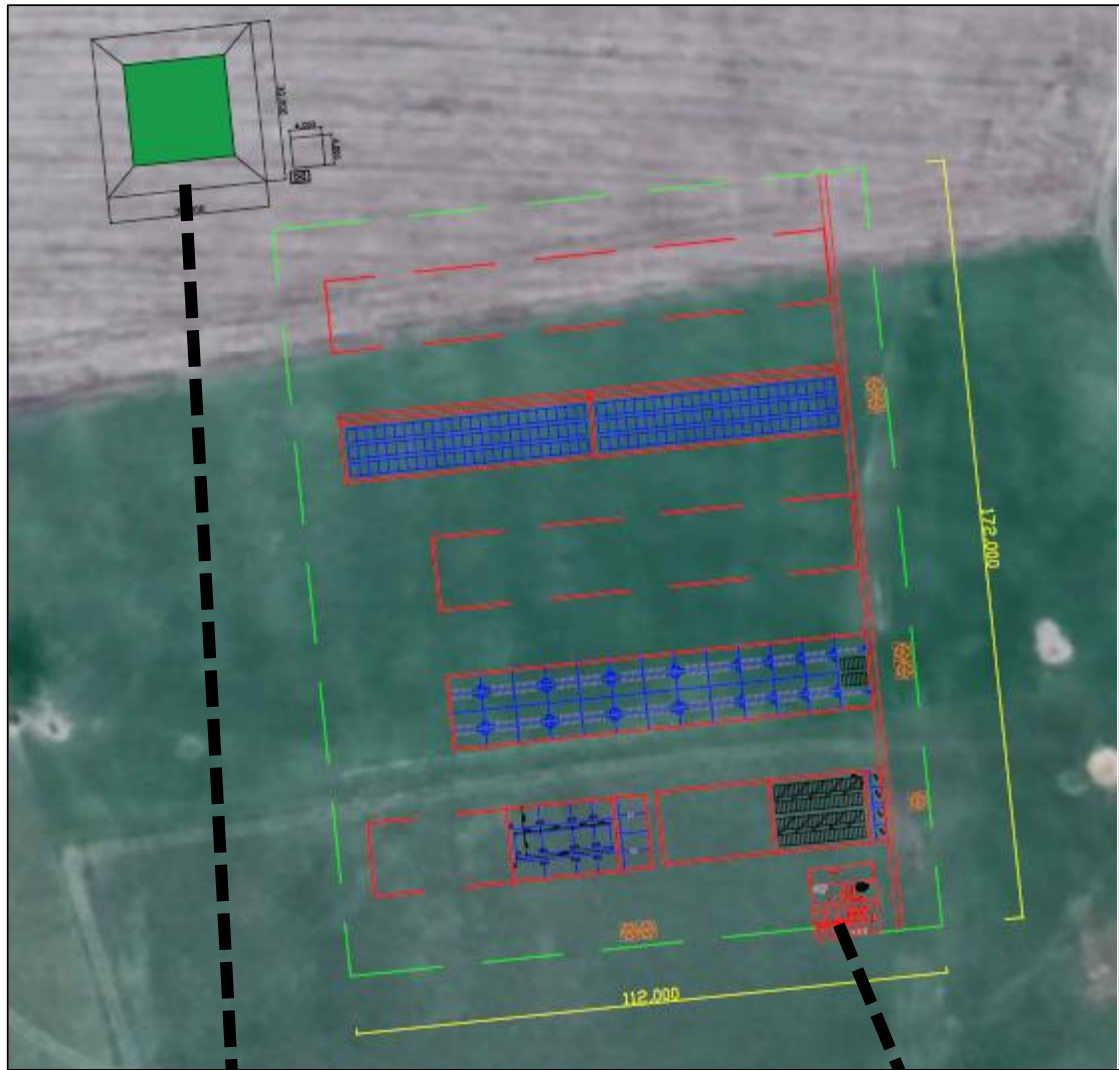


Figure 8 Detail of site layout

The effluent would be managed as follows -

- i) Effluent from staff facilities, including laundry, showers, ablutions and kitchen -
 - o Treated via a septic tank and soakaway system.
 - o The soakaway would be positioned more than 150m away from watercourses.

- o Maximum of 15 workers utilizing facilities per day

ii) Effluent from pigs (water, urine, manure) –

- Effluent Holding Sump (capacity 32 m³);
 - Separator;
 - Solids bunker (capacity 20 m³);
 - Effluent Lagoon (capacity 1200m³);
 - Composting platform (area 200 m³); and
 - Estimated average of solid waste treated per day by composting = 1 ton.
- o Pigs would be housed on fully slatted floors in all pig houses that would allow manure, water and urine waste to fall through into collection pits below each pen.
 - o A 'pull plug' system would instantly wash / suck all effluent out of collection pits as required when pigs are removed from the pens;
 - o The effluent would wash into a concrete-lined Effluent Holding sump. This sump would be 4m x 4m x 2m deep, giving a capacity of 32m³;
 - o From the Effluent Holding sump, the effluent would be pumped into a solids separator (screw-press system) which would separate out all solids from liquid fraction in the effluent;
 - o The solids would be collected into a concrete bunker, before being moved into windrows on a composting platform;
 - o The solids would undergo a controlled composting process to develop into a high-value compost product in 3-4 months. The compost would be spread onto cultivated lands;
 - o The liquid fraction of the effluent would be piped from the Separator into a lined Effluent Storage lagoon. The lagoon is 30m x 30m x 2.5m depth including freeboard, giving a capacity of 1200m³ and 3 months storage;
 - o It would be temporarily stored in the lagoon, before being irrigated onto cultivated lands, in accordance with the stipulations of the NWA.

See the photographs in Annexure C3, which show the process at another piggery facility, which Mount Ashley will be emulating.

The effluent management system for the proposed Mount Ashley piggery is summarized by the following flow diagram -

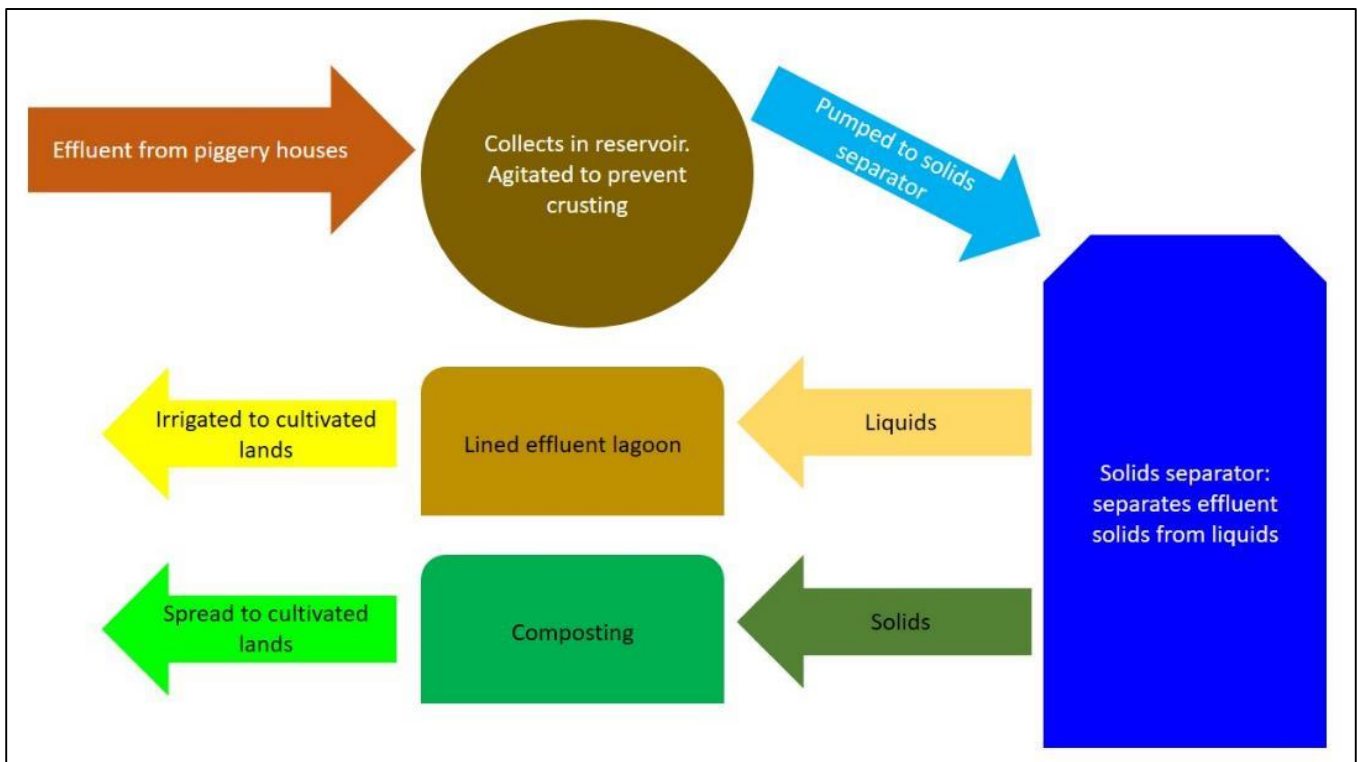


Figure 9 Flow diagram showing Effluent Management System

The effluent management system for the piggery would be a completely contained and closed system. Should there be any breakdown of the components of the effluent management system, service providers are in close enough proximity and competency to have the system up and running within a day. If maintenance work is in process, the proponent would not pull any plugs on the piggery buildings, which then allow for storage of 5-6 weeks in collection pits under the slatted floors.

All runoff from 'dirty' surfaces (i.e. pig houses, passages, composting platform) would be directed into the effluent management system. There would be a concrete slab at the separator and solids bunker site, where any seepage / runoff from the solids would feed back into the Effluent Holding sump.

All 'clean' runoff from roofs, would remain separate to the dirty.

There would be no dirty runoff existing the site in an uncontrolled manner.

The **monthly effluent volumes** would be as follows -

- 'Raw' effluent generated from piggery and housed in Effluent Holding sump: 420 cubic metres /month
- Solids fraction (removed via Separator, composted): 30 cubic metres / month (5-8% of total volume)
- Liquid fraction (after separation, stored temporality in Effluent Lagoon, irrigated onto lands): 390 cubic metres /month
- The Effluent Lagoon has a capacity of 1200 cubic metres of liquid storage.
- Given the proposed volume generated from the piggery, this would allow for a period of 3 months storage.

Composting

A volume of 30m³ of solids is proposed to be composted per month.

This equates to an estimated average of 1 ton of solid waste treated per day by composting.

The composting area would be 200 m².

The solids would undergo a controlled composting process to develop into a high-value compost product in 3-4 months.

Solids would be stockpiled during summer while there are crops in the ground and then spread onto lands during winter after harvesting.

Irrigation with liquid effluent

Liquid effluent would be irrigated onto cultivated lands, in accordance with the stipulations of the NWA.

It is essential that the liquid effluent wastewater irrigated onto cultivated lands annually does not pollute or cause detriment to watercourses and soils. The following is pertinent –

- The new piggery at Mount Ashley would generate 390m³ liquid effluent per month; and 4 680 m³ liquid effluent per year.
- The Nitrogen content of pig manure is approximately 3.5kg / m³.
- At Mount Ashley, this would equate to a Nitrogen load of 16 380 kg N per annum.
- International Best Practice requires an application rate of no more than 200 kg N per hectare per annum.
- To accommodate this level of nutrients, based on International Best Practice, 82 ha land is required
- There is an available area of 300ha of cultivated lands for the effluent to be irrigated, comprising 50 ha pasture and 250 ha maize/soya.
- Thus, Mount Ashley is well within the compliance limits regarding nutrient loading of soils.

The table below indicates the figures and workings of effluent management at the proposed new piggery site -

Table 5 Table showing effluent figures for Mount Ashley piggery

Total number pigs on site	4710		
Total raw effluent	420	m3	per month
<u>After separation</u>			
Liquids	390	m3	per month
Solids	30	m3	per month
Effluent storage lagoon size	1200	m3	

Storage time	3,076923	months	
Nitrogen content of pig effluent			
3,5	kg / m3		
Nitrogen load at Mount Ashley	1365	per month	
	16380	per year	
International Best Practice application rate of 200 kg N per hectare per annum			
Land required for pig effluent application on farm	81,9		
Land available	300		

Furthermore regarding general wastewater management, the recommendations of DWS would be adhered as follows -

- During operation - there will be no vehicles on site. Due to biosecurity, no vehicles will enter security fence; feed trucks are serviced by feed supplier and equipment used to move weaners and solid manure are maintained at farm garage and workshop 5km from this site.
- The use of any temporary, chemical toilet facilities during the construction phase would not cause any pollution to water sources or pose a health hazard. These toilets would be situated within 100m from a watercourse (which is further than the 1:100 year floodline). Furthermore, no form of secondary pollution would arise from the disposal of refuse or sewage from the temporary, chemical toilets.
- The following is applicable should small volumes of wastewater be generated during the construction phase –
 - Water containing waste must not be discharged into the natural environment;
 - Measures to contain the water containing waste and safely dispose would be implemented.

9.3 Water use

During construction

During the construction phase, water would be obtained from the nearby irrigation dam, as guided by EMPr.

Additionally, the washing of vehicles and machinery may need to take place. This should take place in appropriate location at least 100m from watercourses, using water stored on the farm. No washing of construction vehicles / machinery would be allowed from the watercourses.

During operation

Water volumes required for the proposed piggery are outlined in the table below –

Table 6 Table showing water volumes for the proposed Mount Ashley piggery

	No.	Water requirement / animal / day (l)	Water requirement / month (cubic metres)	Water requirement / year (cubic metres)
Sows	700	10	210	2520
Lactating sows	300	25	225	2700
Boars	10	8	2,4	28,8
Piglets	3600	0,5	54	648
Replacement gilts	100	8	24	288
TOTAL	4710	51,5	515,4	6184,8

Water would be obtained from an existing, registered dam on site.

Water use efficiency

The slatted flooring proposed at the Mount Ashley unit allows for pig manure, water, urine to drop through to collection pits under the pig houses. This system greatly reduces washdown requirements (and hence water use) as opposed to solid flooring. This is coupled with a pull plug system which instantly washes/sucks all effluent out of the collection pits – thus, water use on the farm is optimized.

Moreover, liquid effluent after solids separation will be recycled back into irrigation system. This effluent would be spread on to surrounding crop and pasture lands according to NWA guidelines and international best practice, thereby maximizing the economic value of this organic fertilizer.

DWS considerations

The proposed development site is within 500m of a wetland. Thus, a Risk Assessment is required to determine the risk of the proposed development on the wetland system. If Low Risk, General Authorization (GA) of the water use activities will be permissible. If Moderate to High risk, a WUL is required.

DWS is required to advise on the requirement for a Risk Assessment to be undertaken to determine the licensing process for water use activities **c)** and **i)**.

Furthermore, the irrigation with wastewater is proposed under General Authorization.

The guiding principles of application of wastewater to cultivated lands are as follows -

- The application of the biodegradable industrial wastewater from confined animal feeding operations to agricultural land occurs as a standard practice in accordance with the principles of wastewater reuse where possible as guided by the GN 665 of 06 September 2013.
- It is relevant to note that such activities are not only comprehensively dealt with by the National Water Act (No 36 of 1998) and relevant Government Notices, but advocated by the Minister of Water Affairs in this Volume 2 guideline documentation as:

“...specifically developed to encourage the responsible use of wastewater sludge in agricultural practices. The agricultural use of sludge is defined as the beneficial use....to benefit either the soil condition and/or enhance crop production in a sustainable manner. The potential benefits of the nutrients (nitrogen, phosphorus and potassium) and the high organic carbon content of sludge have been well demonstrated and have led to the utilization of sludge for agricultural practices in many countries. The agricultural use of sludge is seen as an appropriate cost effective management option for South Africa both for the agricultural and wastewater industry. Sludge can also assist in increasing the organic content of soil. Generally, cultivated soils in South Africa are low in organic matter due to its rapid decomposition in our climate. This improvement of the physical properties of soil (water holding capacity, permeability etc.) as a result of an increase in organic carbon plays an important role in promoting the agricultural application of wastewater sludge in South Africa.” (WRC, TT 262/06).

The application of wastewater to agricultural land is thus the recommended option in accordance with the advocated principles of reuse, where possible and recognized beneficial effects are applicable.

The inclusion of a separator stage is also recommended as per the Precautionary Practices conditions stipulated in the GN. This also results in a better liquid fraction quality with associated benefits for the application thereof to agricultural land. In addition, the solids fraction may be composted and used as an organic soil amendment with unrestricted classification (as per international and WRC TT 262/06 guidelines).

9.4 Stormwater management

The piggery would employ best practise stormwater management, as outlined below –

- Rainwater would be captured from the piggery roofs and collected in the existing dam / JoJo tanks;
- Clean stormwater from the piggery (e.g. roofs, road surfaces) would drain to stormwater grassed swales / natural drainage lines and contours and be dispersed over grassed, flat areas;
- Clean stormwater would not be directed to the effluent management system as this would increase effluent volumes that need to be managed;
- All clean and dirty stormwater effluent would remain separate and be treated separately;

- Energy dissipating measures with regards to stormwater outflow points would be installed where necessary to prevent soil erosion.
- All drainage would be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream, of any stormwater discharge points

9.5 Air emission

During construction

Dust would be created during the construction phase due to site clearing and building activities. This is short-lived and is not considered to be of significant impact.

During operation

Dust would also be created during the operational phase with vehicles accessing the piggery, however this is not expected to be of significant impact. Surfaces would be concreted, grassed or hardened as soon as established, thus minimizing dust generation.

9.6 Energy

There is a 100Kv Eskom transformer on site which would be used for the electricity source.

The following means to increase energy efficiency would be employed at the Mount Ashley piggery unit –

- Use of natural ventilation and lighting as far as possible;
- Orientation of buildings to:
 - Optimise temperature management for sun influence; and
 - Prevailing wind direction for natural ventilation.
- Control ventilation and temperature within the houses through the use of drop-down curtains;
- Correct Eskom tariff selection to suit the development;
- Low energy lighting and heating appliances;
- Thermostatic heater controlled devices; and
- Timers to manage energy usage in peak times of operation.

Furthermore, once operational (and generating an income), solar panels may be considered to be placed on the piggery roofs, with batteries and invertors to generate energy to power the facility.

In terms of nutrient energy, the all effluent from the piggery would be captured (treated) and applied to cultivated lands as a nutrient-dense organic fertilizer – thus ensuring a closed on-farm energy cycle.

9.7 Viewshed

The proposed piggery site is found within the 5km buffer of the Protected Area (PA) of Midmar Dam. Thus, visual / 'sense of place' impacts on the PA must be considered.

See the Google Earth image below showing the site in relation to the PA of Midmar Dam.

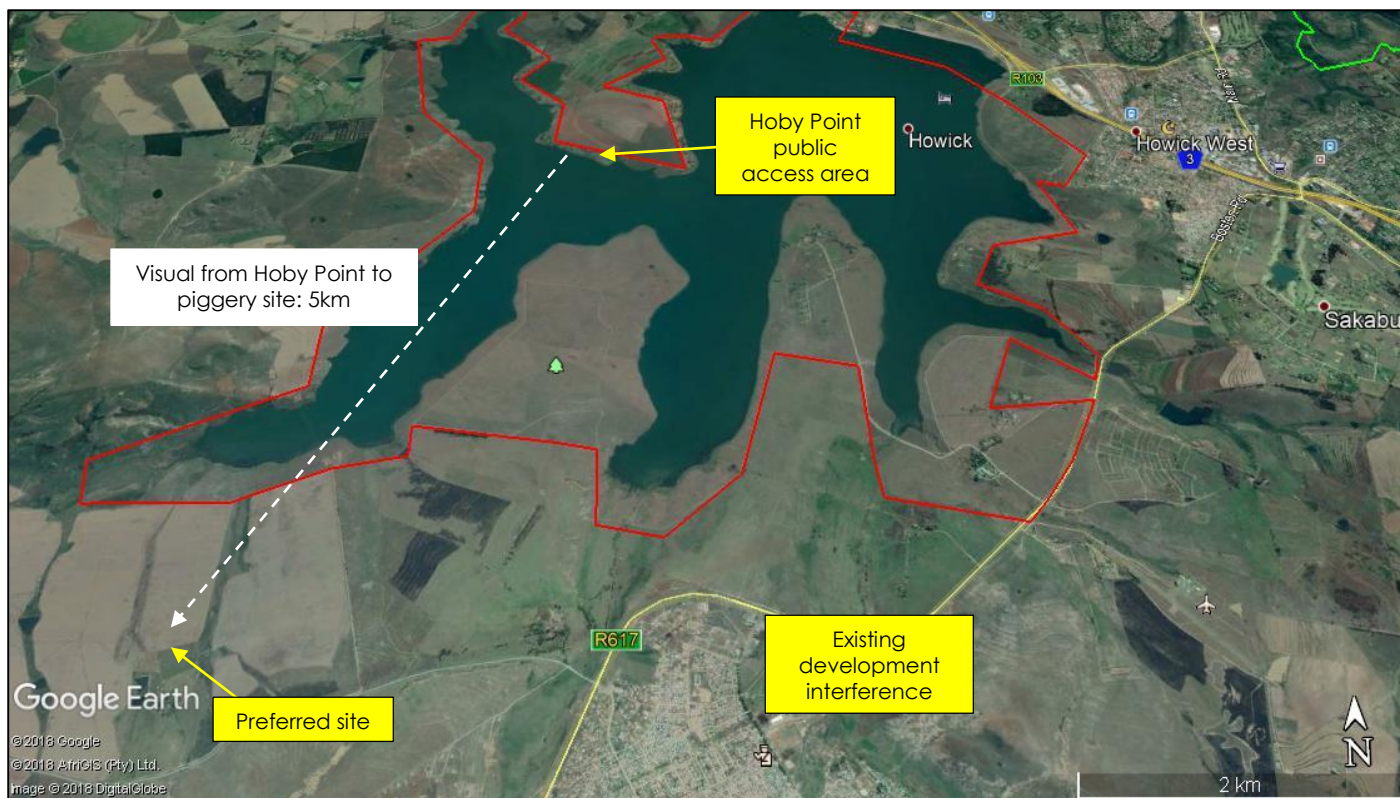


Figure 10 Proposed site in relation to Midmar Dam PA

The following facts should be considered –

- The proposed piggery site is more than 5km from the public area of Midmar, Hoby Point.
- Hoby Point is used for boating activities, not camping.
- The viewshed from Hoby Point includes infrastructure of Mphophomeni, power lines and other development activity.
- The proposed piggery would be in line with the agricultural zoning of the area.
- Should it be endorsed by Ezemvelo KZN Wildlife, the piggery would make considerations for design and aesthetics where possible, for example to paint the roofs of the pig houses green; and to plant a screen of indigenous trees / hedge on the northern side of the facility to reduce visual impact on the PA.

A site visit was conducted by the EAPs and proponent with Mr D Wieners and Ms Noluthando Dlamini from Ezemvelo KZN Wildlife on the 26 October 2018 to the proposed piggery site and then to various areas of Midmar Dam to address concerns of EKZNW, being; odour, flies, sense of place, tourism and water quality.

It was discussed at the site visit that the visual impact of the proposed piggery on the public 'sense of place' at Midmar Dam would be negligible. We await EKZNW comments on the draft BAR confirming this.

9.8 Flies

Flies should be of minimal nuisance due to the following operation factors –

- All the manure under the slatted floors is submerged in liquid (urine and water), making it impossible for flies to lay;
- The small amount of manure in the separator sump is stirred regularly, preventing laying;
- The solids, post separator, are removed regularly;
- Once the solids are laid out for composting, it will be too hot for fly larvae to survive (composting process).

The proponent's house is 500m away from the proposed piggery facility; should there be any issues with flies, he will be the first to know there is a problem and will deal with it.

Furthermore, the closest neighbor to the proposed piggery is more than 1.5km away; and the site is downwind of and more than 5km away from the public boating area at Midmar Dam.

9.9 Odour

The proposed piggery facility would generate odour as consistent with all piggeries. These emissions, although possibly offensive to neighbours, are not controlled by any sphere of legislation. The nearest neighbour to the unit is located approximately 1.5km away.

The prevailing wind blows from Midmar Dam to the proponent's property; the closest public camping area (Hoby Point) at Midmar is over 5km away. Thus, odour impacts to the public are not considered an issue.

Moreover, the use of the screw-press separator would reduce the organic matter and suspended solids in the liquid fraction of the effluent; this would reduce offensive odours emanating when liquid effluent is applied to croplands.

Odour on the farm is agricultural in nature and consistent with livestock enterprises such as milk and pork production. Management measures are implemented to try to reduce odour as is practical in order to reduce offense to neighbours.

The principle sources of odours would be -

- Piggery buildings (concentration of pigs)
- Effluent sumps
- Irrigation of liquid effluent wastewater to cultivated lands
- Composting process
- Disposal of livestock carcasses.

The following measures would be undertaken to reduce the offensiveness of odour on the farm -

Piggery buildings

- The piggery buildings would be kept clean and well ventilated since bad odours build up when there is poor or inadequate ventilation.
- Excessive build-up of manure within piggery houses and below the floor area is avoided by frequent flushing (pull-plug) of effluent from the houses into effluent sumps.

Effluent sumps

- Effluent is not stored in sumps for long periods (maximum of 3 months), therefore eliminating the odour as a result of aerobic decomposition.
- Effluent sumps are regularly inspected to ensure there is no leaks or overflow of effluent.
- Sufficient freeboard is available to ensure storage integrity during heavy rainfall events.

Irrigation of liquid effluent wastewater to cultivated lands

- Liquid effluent (after separation) from the Effluent Lagoon would be distributed onto cultivated lands via travelling irrigation guns or hand moved sprinklers.
- Pumping occurs regularly, as weather conditions permit.
- Irrigation is avoided on windy and wet days.
- Irrigation is avoided on weekends and public holidays, as far as possible.
- All irrigation is conducted on a rotational basis so as to avoid soil nutrient loading leading to toxic levels.

Composting

- The solid fraction of the effluent is stored on an impermeable surface that is properly drained, with drains leading back to the effluent sump.
- Carbon (in the form of straw) would be added to the solid fractions to obtain the correct C: N balance.
- When composting is occurring effectively, there is no odour.

Disposal of livestock carcasses.

- Mortalities would be stored in enclosed areas prior to being taken to the composting area.
- Disposed carcasses will be completely buried in the compost, thus escaping odour is minimal.

These measures would continue to be undertaken at the new piggery expansion site.

9.10 Noise

During construction

Construction would generate noise consistent with building activities. This would be within managed limits and for a short duration.

The closest neighbour is over 1.5km away.

During operation

During operation, there would be noise from the daily activities of the pigs and staff operations on the property, as well as by vehicles accessing the property.

Noise is minimised by maintaining a low stress environment for the pigs, which the proponent will strive for on all accounts.

Noise impacts are not considered significant.

9.11 Freshwater

The relevant Watercourse Study has been carried out to determine the sensitivity/significance of the watercourses near the site. See the report in Annexure D1.

The piggery site is more than 100 meters away from NFEPA wetlands. A series of modified wetlands were identified within 500 meters of the proposed site; these wetlands have been afforded a 32m 'no development' buffer. Note that the watercourses on either side of the proposed piggery site are non-perennial.

The effluent management system for the piggery would be a completely contained and closed system. See section 9.2.

The irrigation with liquid effluent would be controlled under the ambit of GN 665 (2013).

In order to measure and monitor any impacts on water quality as a result of the piggery and associated activities (composting, irrigation with liquid effluent), a Water Quality Monitoring Programme has been developed as follows –

9.11.1 Water Quality Monitoring Plan

The Google Earth image below indicates the site and proposed sampling points –

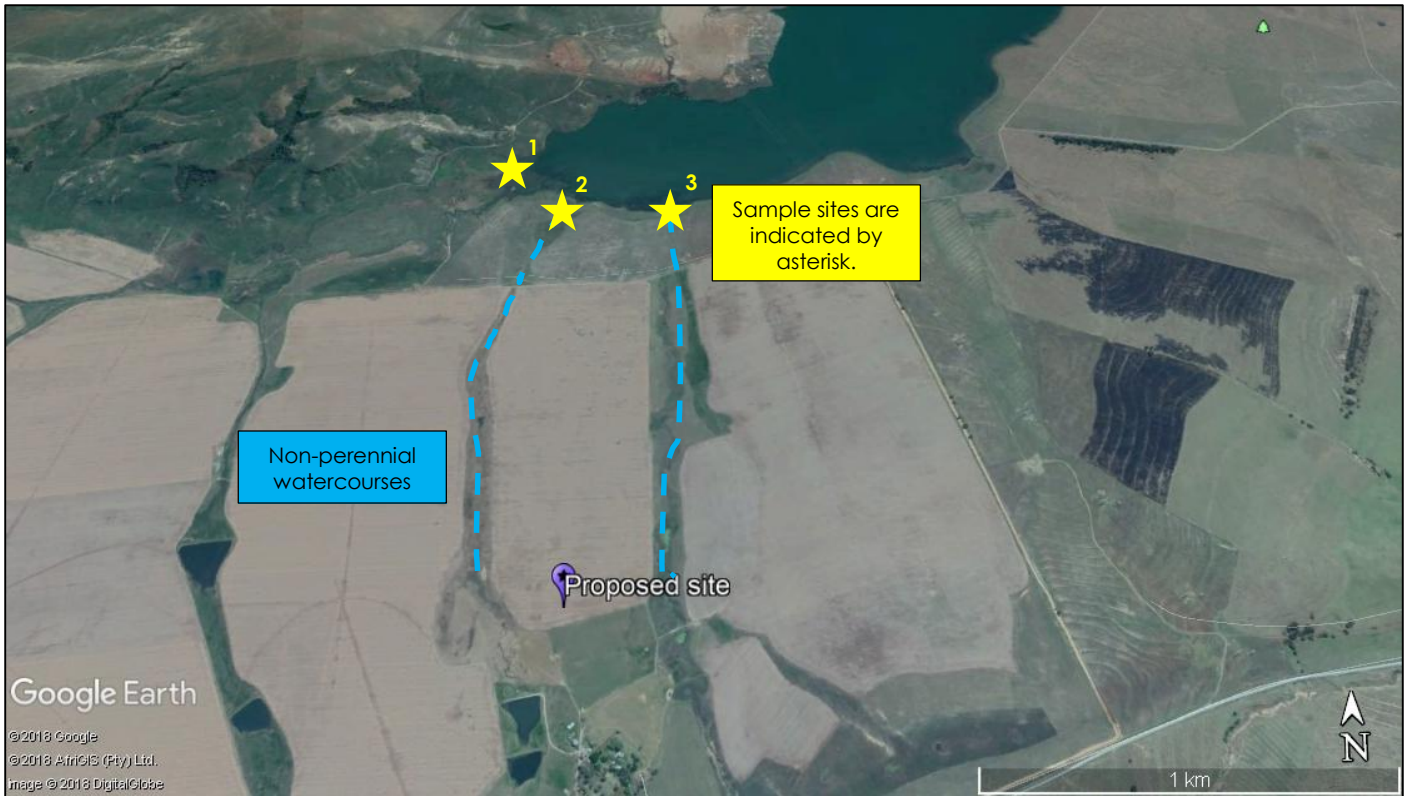


Figure 11 Proposed Water Quality Monitoring Plan

i. Obtain baseline data

Sample points

- a. Headwaters of Midmar dam, site 1
- b. Point of discharge into Midmar Dam from watercourse 1, site 2
- c. Point of discharge into Midmar Dam from watercourse 2, site 3

Frequency of sample

- a. Once-off before construction and operation of site
- b. During period of flow (annually, watercourse is non-perennial).

Analysis of sample

- a. Chemical analysis by a certified laboratory (e.g. Talbot and Talbot)
- b. The following parameters must be measured:
 - o Ammonia
 - o Chemical Oxygen Demand (Total)
 - o Potassium
 - o Total Nitrogen
 - o Total Phosphorus
 - o Nitrate/Nitrite
 - o Orthophosphate
 - o Suspended Solids at 105°C

ii. Obtain data during operation

Sample points

- a. Point of discharge into Midmar Dam from watercourse 1, site 2
- b. Point of discharge into Midmar Dam from watercourse 2, site 3

Frequency of sample

- a. When site is operational
- b. During period of flow (annually, watercourse is non-perennial).

Analysis of sample

- a. Chemical analysis by a certified laboratory (e.g. Talbot and Talbot)
- c. The following parameters must be measured:
 - o Ammonia
 - o Chemical Oxygen Demand (Total)
 - o Potassium
 - o Total Nitrogen
 - o Total Phosphorus
 - o Nitrate/Nitrite
 - o Orthophosphate
 - o Suspended Solids at 105°C

9.12 Cultural / historical

The proposed site is on land that has been completely transformed by cultivation.

There are no signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site.

There will be no building or structure older than 60 years affected in any way.

Therefore, a Heritage Impact Assessment has not been undertaken.

However, due to the fact that the proposed piggery would exceed 5 000 m² in extent, and may change the character of the site, it is necessary to submit the application to Amafa via the SAHRIS website.

Amafa KwaZulu-Natal Heritage Council have been invited to provide comment in this application and guide any permitting process which may be required.

9.13 Vegetation and Biodiversity

The terrain on the proposed site is identified through a desktop analysis of having a slope of between 1-8°, with historical contouring. The soils are likely dominated by Hutton, Clovelly, Griffin and Longlands soil forms. The texture is sandy-clay-loam and is between 400 and 900 cm deep on average.

While the natural vegetation of the area is Southern KwaZulu-Natal Moist Grassland (Gs 11, Mucina and Rutherford, 2006), the proposed piggery expansion site is located on completely transformed lands of maize and kikuyu pasture.

A MINSET map has been developed for Mount Ashley and is seen below (also found in Annexure H3). The MINSET output map shows areas that are already protected as Mandatory Reserves (totally irreplaceable) and Negotiable Reserves (most efficient for achieving targets and constraints). The proposed site lies outside of the irreplaceable critical biodiversity areas.

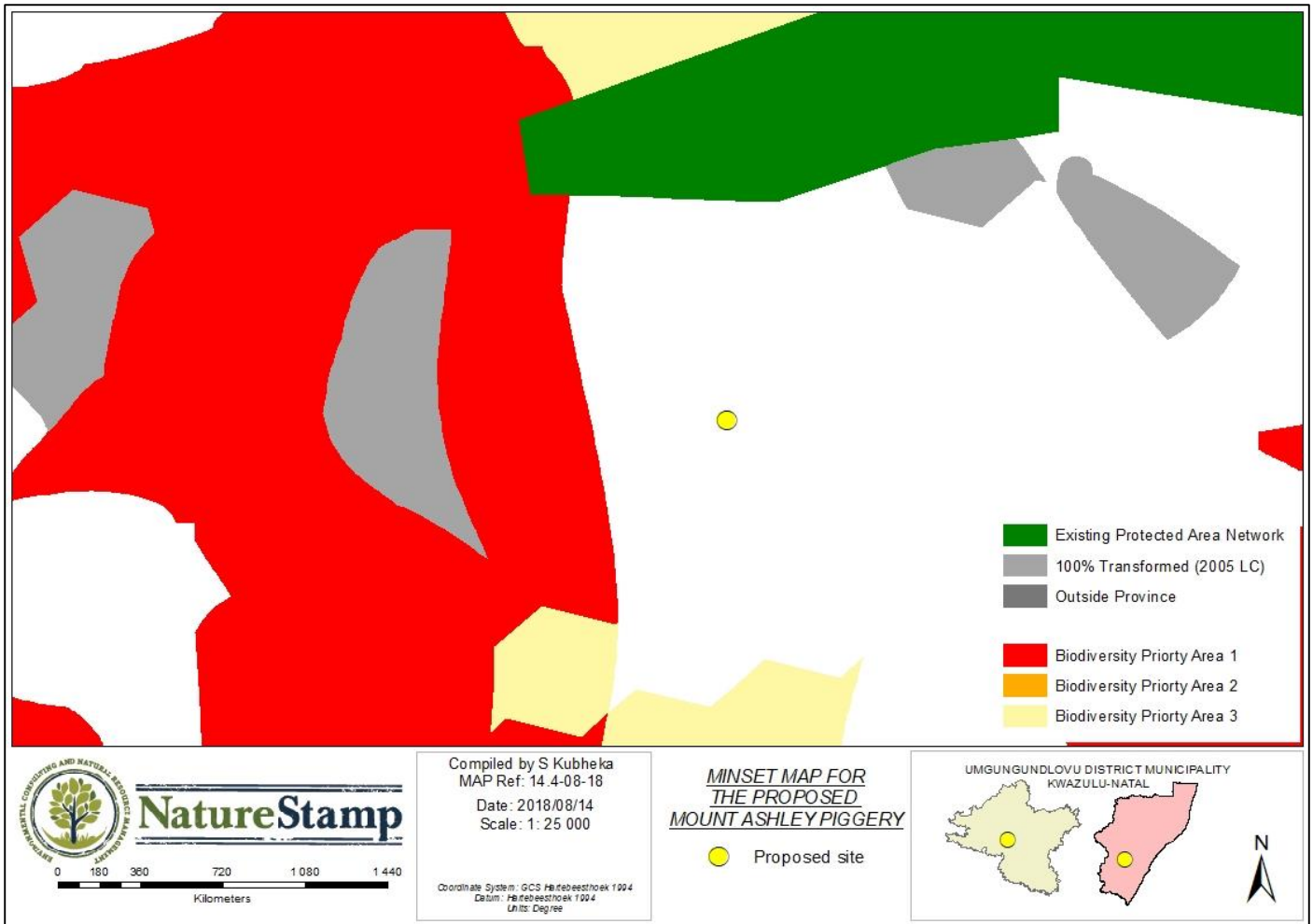


Figure 12 Minset Classification Map for the proposed Mount Ashley piggery expansion

According to Minset, there are no species of conservation significance that are modelled to occur on the site.

9.14 Spatial Planning

According to the 2017/2018 - 2021/2022 Integrated Development Plan (IDP) for Umngeni Municipality, the proposed Mount Ashley site is found on land designated for 'Agriculture and Eco-Tourism'.

See an extract from the IDP in the figure below.

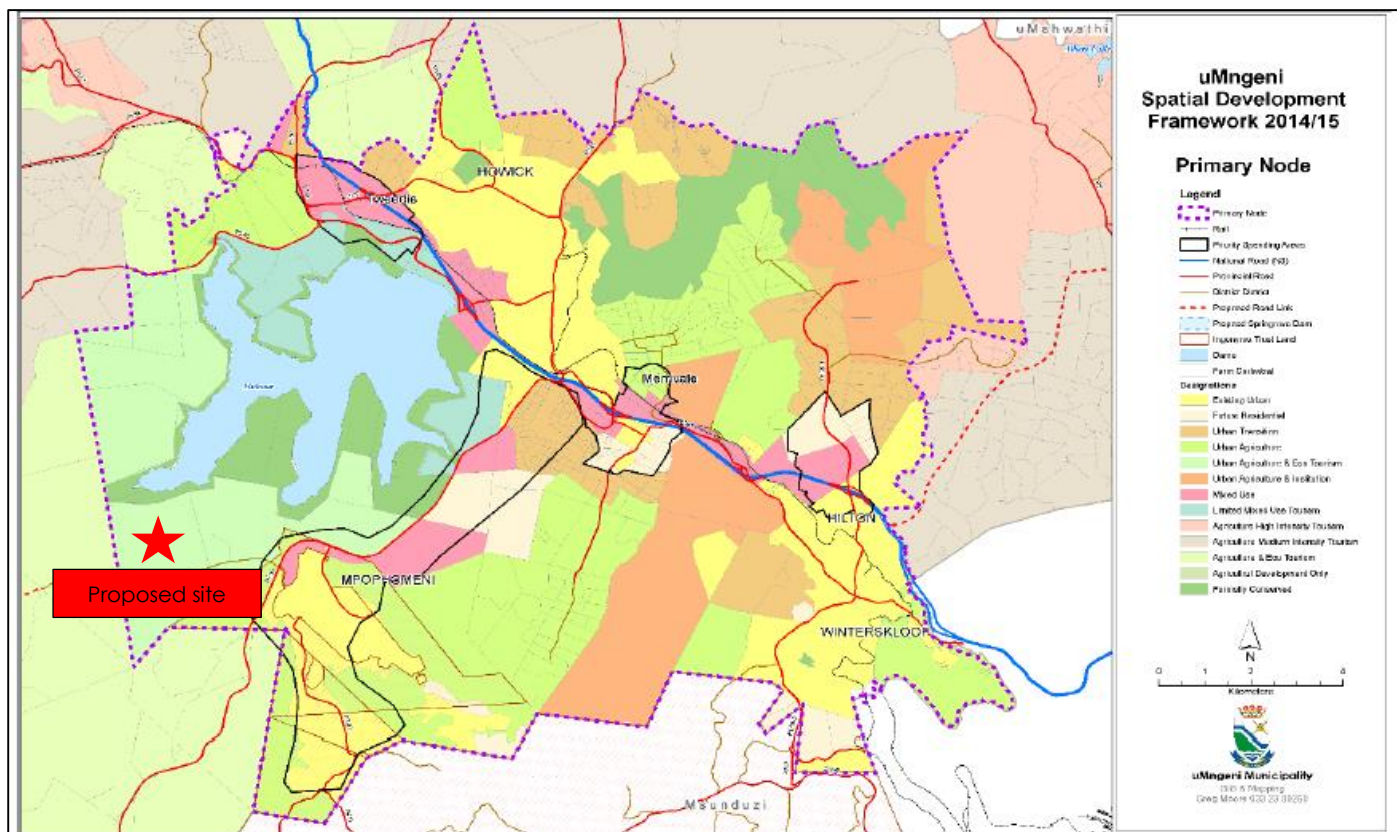


Figure 13 Extract from Umngeni IDP (2017-2022)

Thus the proposed piggery expansion - which is Agricultural landuse - is in line with the municipal spatial development planning for the area.

9.15 Surrounding landuse

The following landuses and/or prominent features that occur within a 500m radius of the proposed site, and how these landuses impact on / are impacted on by the proposed development are given in the table below.

Table 7 Landuses within 500m of the proposed development

Land use character			Description of impact
Natural area	YES		Midmar Dam is located north of the proposed site. The piggery expansion activities could potentially impact the water quality in the area.
Low density residential		NO	
Medium density residential		NO	
High density residential		NO	
Informal residential		NO	
Retail commercial & warehousing		NO	
Light industrial		NO	
Medium industrial		NO	
Heavy industrial		NO	
Power station		NO	
Office/consulting room		NO	
Military or police base/station/compound		NO	

Spoil heap or slimes dam		NO	
Quarry, sand or borrow pit		NO	
Dam or reservoir	YES		Midmar Dam is located north of the proposed site. The piggery expansion activities could potentially impact the water quality in the area. There are also farm dams within 200m of the proposed site.
Hospital/medical centre		NO	
School/ crèche		NO	
Tertiary education facility		NO	
Church		NO	
Old age home		NO	
Sewage treatment plant		NO	
Train station or shunting yard		NO	
Railway line		NO	
Major road (4 lanes or more)		NO	
Airport		NO	
Harbour		NO	
Sport facilities		NO	
Golf course		NO	
Polo fields		NO	
Filling station		NO	
Landfill or waste treatment site		NO	
Plantation		NO	
Agriculture	YES		Pasture and maize/soya cultivation within the Mount Ashley Farm. The proposed piggery expansion will yield effluent which will be applied to these croplands.
River, stream or wetland	YES		Wetlands more than 100m away from the proposed site, wetlands may be impacted on by the effluent produced at the piggery unless mitigation is put into place.
Nature conservation area	YES		Midmar Nature Reserve, more than 1km from the proposed site however, within the 5km protected area buffer. The proposed piggery expansion may impact the sense of place of the Nature Reserve through visual and odour impacts unless mitigated.
Mountain, hill or ridge		NO	
Museum		NO	
Historical building		NO	
Protected Area	YES		Midmar Nature Reserve, more than 1km from the proposed site however, within the 5km protected area buffer. The proposed piggery expansion may impact the sense of place of the Nature Reserve through visual and odour impacts unless mitigated.
Graveyard		NO	
Archaeological site		NO	
Other land uses (describe)		NO	

10. IMPACT SUMMARY AND SCORING

10.1 Ranking of environmental issues and risks

All potential environmental issues and risks that were identified during the environmental impact assessment process can be found in sections 8 and 9 accordingly.

These risks are ranked according to primary and secondary, as follows-

Primary risks

The following potential impacts have been identified by the EAP as key environmental risks should the proposed piggery expansion be approved –

- Impacts on water quality due to indiscriminate solid waste and effluent management
- Impacts on 'sense of place' due to indiscriminate fly, odour, visual management.

Secondary risks

The following potential impacts have been identified by the EAP as minor and associated environmental risks should the proposed piggery expansion be approved –

- Impacts of poor stormwater management (water contamination and soil erosion).

10.2 Significance scoring of impacts

An assessment of the significance of the primary risks has been undertaken, including –

- the nature, significance and consequences of the impact and risk
- the extent and duration of the impact and risk
- the probability of the impact and risk occurring
- the degree to which the impact and risk can be reversed
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be mitigated.

During this process the primary impacts are evaluated prior to mitigation as well as post-mitigation to determine the necessary steps that need to be taken to reduce the overall effect of the development on the environment.

The significance scoring sheets, displaying the pre-mitigation and post-mitigation scores as well as their overall meaning, can be found in Annexure E.

Prior to mitigation the total significance score for potentially negative impacts amounted to **13.7**, which falls within the 8-20 scoring category and translates to “**material / important to investigate**”. This means the impacts are of importance and are therefore considered to have a substantial impact. Mitigation is required to reduce the negative impacts and such impacts need to be evaluated carefully.

Post-mitigation the total significance score for potentially negative impacts was reduced to **7.1**, which falls within the 5-7 scoring category and translates to “**marginal / slight / minor**” significance. This means the impact is of little importance, but may require limited mitigation; or it may be rendered acceptable in light of proposed mitigation.

10.3 Management of impacts

The following table provides the primary and secondary potential impacts and the mitigation measures put forward to avoid, reduce or manage the impacts accordingly.

See the EMPr for management of all environmental risks.

Table 8 Mitigation measures for potential impacts of the development

Potential impact Primary risks	Mitigation measure proposed
<p>Impacts on water quality due to indiscriminate solid waste and effluent management</p>	<p>Solid waste management</p> <p><u>During construction</u></p> <ul style="list-style-type: none"> • Approximately 10m³ of construction waste generated per month. • Collect in a combination of skips and waste receptacles located on-site. • Skips and waste receptacles must be located in designated storage / collection areas prior to being safely disposed of and must not cause any surface and groundwater pollution, or pose any health hazards. • All waste material generated must be disposed of at the Umngeni Municipality permitted landfill (Curry's Post) that is authorized to accept such waste. Safe disposal certificates must be kept on record. • Private construction contractors must also provide proof of disposal at appropriate landfills used. • If contaminated soil or other hazardous materials require disposal (unlikely), a private waste management service provider must be contacted (e.g. Enviroserv). • Recycling of suitable materials must be undertaken as appropriate. <p><u>During operation</u></p> <p>Solid waste includes –</p> <ol style="list-style-type: none"> i. dead pigs (approx. 1224 dead animals/year) ii. used medicinal materials (vaccinations / artificial insemination straws). <p>These waste streams must be managed as follows –</p> <ol style="list-style-type: none"> i. Dead pigs – The dead pigs must be disposed of via composting. ii. The carcasses must be included into the effluent solids composted manure where rapid decomposition takes place over a period of 6 weeks. <ol style="list-style-type: none"> i. Medicinal waste – general waste (packaging / plastics) must be recycled or disposed of with general farm waste (landfill / buried). Old vaccination vials and syringes must be disposed of into a designated container, and returned to the veterinary wholesaler for safe disposal. There must be no medicinal waste entering the effluent management system. <p>Effluent waste management</p> <p><u>During construction</u></p> <ul style="list-style-type: none"> • An appropriate number of temporary, chemical toilet facilities must be provided for labourers during the construction phase: at least 1 toilet for every 20 workers. • The toilets must be positioned a minimum of 100m away from any water resources. • The toilets must be maintained in a satisfactory condition. • The toilet service provider is responsible for taking away and disposing of the toilet waste, as consistent with their respective Waste Management License. <p><u>During operation</u></p> <p>The effluent generated during operation consists of the following –</p> <ul style="list-style-type: none"> • Effluent from staff ablutions (showering and toilet) – managed via a septic tank and soakaway system. <ul style="list-style-type: none"> ○ Soakaway must be positioned more than 150m away from watercourses. • Effluent from pigs (water, urine, manure) – <ul style="list-style-type: none"> ○ Pigs must be housed on fully slatted floors in all pig houses that allows manure, water and urine waste to fall through into collection pits below each pen; ○ A 'pull plug' system would instantly wash / suck all effluent out of collection pits as required when pigs are removed from the pens; ○ The effluent would wash into a concrete-lined Effluent Holding sump; ○ From the Effluent Holding sump, the effluent must be pumped into a solids separator (screw-press system) which would separate out all solids from liquid fraction in the effluent;

	<ul style="list-style-type: none"> ○ The solids must be collected into a concrete bunker, before being moved into windrows on a composting platform; ○ The solids would undergo a controlled composting process to develop into a high-value compost product in 3-4 months; ○ The compost would be spread onto cultivated lands; ○ The liquid fraction of the effluent must be piped from the Separator into a lined Effluent Storage lagoon; ○ It must be temporarily stored in the lagoon, before being irrigated onto cultivated lands, in accordance with the stipulations of the NWA and international Best Practice regarding the application rate of Nitrogen per hectare per annum. <ul style="list-style-type: none"> ● The effluent management system for the piggery must be a completely contained and closed system. ● Should there be any breakdown of the components of the effluent management system, service providers are in close enough proximity and competency to have the system up and running within a day. If maintenance work is in process, the proponent must not pull any plugs on the piggery buildings, which allows for storage of 5-6 weeks in collection pits under the slatted floors. ● All runoff from 'dirty' surfaces (i.e. pig houses, passages, composting platform) must be directed into the Effluent Management system. ● There must be a concrete slab at the separator and solids bunker site, which allows any seepage / runoff from the solids to feed back into the Effluent Holding sump. ● All 'clean' runoff from roofs, would remain separate to the dirty. ● There must be no dirty runoff existing the site in an uncontrolled manner.
<p>Impacts on 'sense of place' due to indiscriminate fly, odour, visual management.</p>	<p>Fly management Flies should be of minimal nuisance due to the following operation factors –</p> <ul style="list-style-type: none"> ● All the manure under the slatted floors is submerged in liquid (urine and water), making it impossible for flies to lay; ● The small amount of manure in the separator sump is stirred regularly, preventing laying; ● The solids, post separator, are removed regularly; ● Once the solids are laid out for composting, it will be too hot for fly larvae to survive (composting process). <p>Odour management Odour on the farm is agricultural in nature and consistent with livestock enterprises such as milk and pork production. Management measures are implemented to try to reduce odour as is practical in order to reduce offense to neighbours, as follows -</p> <p><u>Piggery buildings</u></p> <ul style="list-style-type: none"> ○ The piggery buildings must be kept clean and well ventilated since bad odours build up when there is poor or inadequate ventilation. ○ Excessive build-up of manure within piggery houses and below the floor area is avoided by frequent flushing (pull-plug) of effluent from the houses into effluent sumps. <p><u>Effluent sumps</u></p> <ul style="list-style-type: none"> ○ Effluent is not stored in sumps for long periods (maximum of 3 months), therefore eliminating the odour as a result of aerobic decomposition. ○ Effluent sumps are regularly inspected to ensure there is no leaks or overflow of effluent. ○ Sufficient freeboard is available to ensure storage integrity during heavy rainfall events. <p><u>Irrigation of liquid effluent wastewater to cultivated lands</u></p> <ul style="list-style-type: none"> ○ Liquid effluent (after separation) from the Effluent Lagoon must be distributed onto cultivated lands via travelling irrigation guns. ○ Pumping occurs regularly, as weather conditions permit. ○ Irrigation must be avoided on windy and wet days. ○ Irrigation must be avoided on weekends and public holidays, as far as possible. ○ All irrigation must be conducted on a rotational basis so as to avoid soil nutrient loading leading to toxic levels.

	<p><u>Composting</u></p> <ul style="list-style-type: none"> ○ The solid fraction of the effluent must be stored on an impermeable surface that is properly drained, with drains leading back to the effluent sump. ○ Carbon (in the form of straw) must be added to the solid fractions to obtain the correct C: N balance. ○ When composting is occurring effectively, there is no odour. <p><u>Disposal of livestock carcasses</u></p> <ul style="list-style-type: none"> ○ Mortalities must be stored in enclosed areas prior to being taken to the composting area. ○ Disposed carcasses will be completely buried in the compost, thus escaping odour is minimal. <p>Visual management</p> <p>In order to reduce the visual impacts of the proposed piggery to the Hoby Point boating area of Midmar Dam, the proponent must make considerations for design and aesthetics where possible, as follows –</p> <ul style="list-style-type: none"> ○ The roofs of the pig houses must be painted green. ○ If required, a screen of indigenous trees / hedge on the northern side of the piggery unit must be planted.
Secondary risks	
Impacts of poor stormwater management (water contamination and soil erosion)	<p>Stormwater management</p> <p>The piggery must employ best practise stormwater management, as follows –</p> <ul style="list-style-type: none"> • Rainwater must be captured from the piggery roofs and collected in the existing dam / JoJo tanks; • Clean stormwater from the piggery (e.g. roofs, road surfaces) must drain to stormwater grassed swales / natural drainage lines and contours and be dispersed over grassed, flat areas; • Clean stormwater must not be directed to the effluent management system as this would increase effluent volumes that need to be managed; • All clean and dirty stormwater effluent must remain separate and be treated separately; • Energy dissipating measures with regards to stormwater outflow points must be installed where necessary to prevent soil erosion. • All drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream, of any stormwater discharge points.

11. PUBLIC PARTICIPATION

All requirements in terms of Section 41 of the EIA Regulations (2014, amended 2017) have been undertaken.

Through the EIA process, NatureStamp makes very effort to ensure that information containing all relevant facts in respect of the application is made available to potential IAPs and participation by potential or registered IAPs is facilitated in such a manner that all potential or registered IAPs are provided with a reasonable opportunity to comment on the application, as guided by the regulations.

11.1 Notification of proposed application

Site notices:

Four site notices were placed in clearly visible spots on the 26th September 2016 as follows –

- Mount Ashley Farm entrance,
- Turn off near Mpophomeni,
- Freeway exit into R617, and
- A light industrial area on the R617.

See evidence of site notices in Annexure F3.

Written notice by way of a Background Information Document (BID) to occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; the municipality which has jurisdiction in the area; any organ of state having jurisdiction in respect of any aspect of the activity; any other party as required by the competent authority:

A Background Information Document (BID) was distributed to all IAP's on 04th October 2018, to inform them of the proposed development and encourage them to voice any concerns or issues they may have with it. See IAP Register and BID in Annexure F1 and F2 respectively.

Placing an advertisement in local newspaper:

A newspaper advertisement was placed in the Village Talk newspaper on the 14th September 2018 to notify any additional members of the public that may be interested in the development. This can be seen in Annexure F5.

Other efforts to assist IAPs desirous but unable to participate in the process due to illiteracy, disability, or disadvantage, include –

- The option of a **public and/or stakeholder meeting** to address any issues and concerns that have been raised by IAP's has been made available. To date there has not been major interest shown in the project and no public meeting has been held.
- A site visit was conducted with Mr D Wieners and Ms Noluthando Dlamini from EKZNW on the 09th November 2018.

11.2 IAP comments

Five comments were received in response to the BID. The commenters and their relevant departments are listed below and are reflected in the full Comments and Response table available in Annexure F4.

- i. Susan Viljoen- World Wildlife Fund South Africa (WWF-SA)
- ii. Noluthando Dlamini - EKZNW
- iii. Karen Moodley - Department of Agriculture, Forestry and Fisheries (DAFF)
- iv. Phumelele Sokhulu - Umgeni Water

The draft BAR is currently being circulated to all registered IAPs for 30 days, from the 24th January to 22nd February 2019 to invite further comments. Stakeholders are provided with their own hard copy or electronic (cd / Drop box) report, as requested. The public hardcopy of the report will be made available at the Howick Library (30 Main Road, Howick).

IAPs have been notified of every step of the proceedings and their opportunity to comment.

Comments on the draft BAR will be individually addressed and considered, with any further follow-up and changes to the project plan considered. All comments will be incorporated into the final BAR.

11.3 Summary of IAP issues

A summary of the IAP issues raised, and attendance to such, is provided in the table below.

Table 9 Summary of IAP issues raised and response

Issue	Response / attendance within project
<p><u>Ezemvelo KZN Wildlife</u> <u>Commentator: Noluthando Dlamini</u> <u>Date: 12 October 2018</u></p> <p>Potential air (odour) and water quality impacts on the Midmar Nature Reserve are of concern. Impact on sense of place and tourism experience.</p> <p>Recommendations: It is recommended that; 1. Alternative expansion sites be investigated as part of the Environmental Impact Assessment. 2. In order to safeguard the Midmar Nature Reserve and the sensitive biodiversity features highlighted above, Ezemvelo recommends that: 2.1. A Wetland Delineation assessment is undertaken by a suitably qualified specialist during the appropriate season; and 2.2. An Air (Odour) Quality Assessment is undertaken by a suitably qualified specialist. The assessment must determine the potential odour impacts of the piggery and the significance thereof on the Midmar Nature Reserve and its tourism activities.</p> <p>Given that Midmar Nature Reserve is a public resort that is used and enjoyed by the public, nuisance impacts such as odour and pests is of serious concern. Air quality (odour) issues are notoriously difficult to measure and quantify. In the case of uncertainty, the precautionary principle will need to be evoked</p>	<p>NatureStamp extended an invitation to Ezemvelo for a site visit which would provide clarity around odour and sense of place concerns. The site visit was conducted on the 9th November 2018. It was established that the prevailing winds blow towards the proponent's property and not Midmar therefore odour would not be anticipated to have an impact at the Reserve. During the site visit, Midmar was also visited to assess how much visual impact would potentially occur due to the proposed piggery, Ezemvelo officials advised that they will forward guidelines to NatureStamp regarding construction methods that would minimise the visual impact.</p> <p>Alternatives sites have been discussed in the dBAR and the preferred site has been deemed as the most feasible due to biosecurity reasons.</p> <p>A desktop wetland delineation has been undertaken by a suitably qualified hydrologist (see Annexure D1) which identified various wetlands and they were afforded appropriate buffers.</p> <p>The EMPr outlines mitigation measures for potential odour impacts with specific reference to maintenance of piggery buildings, storage/management of effluent and its application to lands.</p> <p>The storage facility would be impermeable and all effluent generated from the piggery would be managed and processed outside of designated buffer zones.</p> <p>The proximity of Midmar Dam Nature Reserve to the site has been noted, and the proposed expansion would make considerations for design and aesthetics where possible (e.g. use of more vegetation screen, colour of roofing).</p>
<p><u>World Wildlife Fund South Africa (WWF-SA)</u> <u>Commentator: Susan Viljoen</u> <u>Date: 26 September 2018</u></p> <p>Impact on the water quality that could ultimately affect Midmar Dam through run-off.</p>	<p>Please see Effluent Management section 9.2 of report.</p> <p>The effluent storage facility would be impermeable and all effluent generated from the piggery would be managed and processed outside of designated buffer zones. A concrete slab will be at the separator, any drainage would feed into a slurry dam, therefore avoiding runoff. A desktop wetland delineation has been undertaken and the proposed site is more than 100 meters away from the identified FEPA systems. A series of modified wetlands were identified within 500 meters of the proposed site and have been afforded a 32m buffer.</p>
<p><u>Department of Agriculture, Forestry and Fisheries</u> <u>Commentator: Karen Moodley</u> <u>Date: 19 October 2018</u></p> <p>This letter serves as a notice of receipt for the above BID received on the 15th October 2018. Should any further information be required, please do not hesitate to contact this office.</p>	<p>Noted, thank you.</p>

<p><u>Umgeni Water</u> <u>Commentator: Phumelele Sokhulu</u> <u>Date: 19 October 2018</u></p> <p>Potential noteworthy impact on the quality of an essential water resource in the upper UMgeni River system, significant additional nutrients loads to Midmar Dam.</p> <p>Storm water drainage and the related wash-out channels for cleaning of the complex.</p> <p>Management of the potentially contaminated runoff generated from the site.</p> <p>Effluent management system.</p> <p>Water quality monitoring planned for the proposed development (both before and during construction as well as long-term water resources monitoring).</p>	<p>Please see relevant items in section 9 of report.</p> <p>The proposed piggery is not anticipated to have an impact on the nutrient load due to the low volumes of effluent that will be applied on the fields. Water samples have been taken as a baseline, water monitoring will take place to ensure that the irrigation with effluent is not having a negative impact on the water sources.</p> <p>Please note that the watercourses in close proximity to the proposed site are non-perennial rivers that are dry majority of the year. Further, the proposed expansion will be a closed system where effluent storage will be completely lined, dirty stormwater will be directed to effluent storage, which eliminates the risk of contaminated water ending up in the system.</p> <p>The piggery would employ best practise stormwater management.</p>
<p><u>Department of Agriculture, Forestry and Fisheries</u> <u>Commentator: Karen Moodley</u> <u>Date: 30 October 2018</u></p> <p>The designated site for the proposed development has been transformed due to anthropogenic activities, i.e. cultivated lands, thus, the department has no objections towards the proposed development given that there are no protected tree species and/or natural forests that will be affected as per sections 7 and 15 of the National Forests Act.</p>	<p>No protected trees/natural forests were identified as the site is completely transformed by cultivation.</p>

12. ASSUMPTIONS AND KNOWLEDGE GAPS

Assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed are as follows –

- It is assumed that all design parameters and mitigation measures proposed in the EIA reports will be implemented by the Authorization Holder, should the development be authorized. The Significant Scoring of impacts is based on proposed mitigation measures being implemented.
- In the concluding statements, it is assumed that the Environmental Authorization would contain conditions proposed in the EIA report; and that all ongoing monitoring takes place. Compliance and enforcement post-authorization is critical.

13. CONCLUDING STATEMENTS

13.1 Environmental impact statement

It is important to assess an application holistically, addressing the social, economic and environmental factors influencing the project.

Social considerations

The need and desirability for the expansion of Mount Ashley piggery is measured against the contents of the IDP and SDF for the region and is found to align wholly within the ambit of these goals, objectives and spatial plans. The benefits of a technologically-advanced, environmentally-sound and productive operation include:

- Approximately 15 temporary employment opportunities would be created during construction, of which all the unskilled labour required would be sourced from local previously disadvantaged individuals;
- Increased direct job opportunities on farm to 5 fulltime positions when operational;
- Healthy and hygienic work environment for piggery and crop workers;
- Ancillary development within agricultural sector - electricians, consultants, meat inspectors, vets, transport, feed, etc.;
- Not less than minimal wage (likely to be more) for staff, improving the per capita earnings and benefitting the broader community.
- Improved provision of a primary food source, for improved regional and national food security

The proposed development would be consistent with the current agricultural land-use. The Department of Agriculture, Forestry and Fisheries (DAFF) has no objection to the development.

The Sense of Place would in no way be altered. The proximity of Midmar Dam Nature Reserve is noted, and the proposed development would make considerations for design and aesthetics where possible. Following a site visit with the Ezemvelo officials, it was also established that odour would not be a significant impact on this site.

Economic considerations

Commercial agriculture is a key economic sector in the uMgungundlovu District and is listed in the IDP as one of the five critical contributors to the District's net GDP. The proposed development of Mount Ashley piggery expansion is on cultivated land which has been identified by the Umngeni Municipality IDP (2017/18-2021/22) as having moderate arable land potential. It is aligned with the zoning of 'Agriculture and Eco-tourism'. The proposed piggery unit at Mount Ashley would form a critical part of the operation of a technologically-advanced piggery enterprise which aims to improve local and national food security, while providing employment.

Environmental considerations

All potential environmental issues and risks that were identified during the environmental impact assessment process can be found in sections 8 and 9 accordingly.

These risks are ranked according to primary and secondary, as follows-

Primary risks -

- Impacts on water quality due to indiscriminate solid waste and effluent management
- Impacts on 'sense of place' due to indiscriminate fly, odour, visual management.

Secondary risks

- Impacts of poor stormwater management (water contamination and soil erosion).

The following table provides the primary and secondary potential risks and the mitigation measures put forward to avoid, reduce or manage the impacts accordingly.

See the EMPr for management of all environmental risks.

Table 10 Mitigation measures for potential impacts of the development

Potential impact	Mitigation measure proposed
Primary risks	
Impacts on water quality due to indiscriminate solid waste and effluent management	<p>Solid waste management</p> <p><u>During construction</u></p> <ul style="list-style-type: none"> • Approximately 10m³ of construction waste generated per month. • Collect in a combination of skips and waste receptacles located on-site. • Skips and waste receptacles must be located in designated storage / collection areas prior to being safely disposed of and must not cause any surface and groundwater pollution, or pose any health hazards. • All waste material generated must be disposed of at the Umngeni Municipality permitted landfill (Curry's Post) that is authorized to accept such waste. Safe disposal certificates must be kept on record.

- Private construction contractors must also provide proof of disposal at appropriate landfills used.
- If contaminated soil or other hazardous materials require disposal (unlikely), a private waste management service provider must be contacted (e.g. Enviroserv).
- Recycling of suitable materials must be undertaken as appropriate.

During operation

Solid waste includes –

- iii. dead pigs (approx.1224 dead animals/year)
- iv. used medicinal materials (vaccinations / artificial insemination straws).

These waste streams must be managed as follows –

- iii. Dead pigs – The dead pigs must be disposed of via composting.
- iv. The carcasses must be included into the effluent solids composted manure where rapid decomposition takes place over a period of 6 weeks.
- ii. Medicinal waste – general waste (packaging / plastics) must be recycled or disposed of with general farm waste (landfill / buried). Old vaccination vials and syringes must be disposed of into a designated container, and returned to the veterinary wholesaler for safe disposal. There must be no medicinal waste entering the effluent management system.

Effluent waste management

During construction

- An appropriate number of temporary, chemical toilet facilities must be provided for labourers during the construction phase: at least 1 toilet for every 20 workers.
- The toilets must be positioned a minimum of 100m away from any water resources.
- The toilets must be maintained in a satisfactory condition.
- The toilet service provider is responsible for taking away and disposing of the toilet waste, as consistent with their respective Waste Management License.

During operation

The effluent generated during operation consists of the following –

- Effluent from staff ablutions (showering and toilet) – managed via a septic tank and soakaway system.
 - Soakaway must be positioned more than 150m away from watercourses.
- Effluent from pigs (water, urine, manure) –
 - Pigs must be housed on fully slatted floors in all pig houses that allows manure, water and urine waste to fall through into collection pits below each pen;
 - A 'pull plug' system would instantly wash / suck all effluent out of collection pits as required when pigs are removed from the pens;
 - The effluent would wash into a concrete-lined Effluent Holding sump;
 - From the Effluent Holding sump, the effluent must be pumped into a solids separator (screw-press system) which would separate out all solids from liquid fraction in the effluent;
 - The solids must be collected into a concrete bunker, before being moved into windrows on a composting platform;
 - The solids would undergo a controlled composting process to develop into a high-value compost product in 3-4 months;
 - The compost would be spread onto cultivated lands;
 - The liquid fraction of the effluent must be piped from the Separator into a lined Effluent Storage lagoon;
 - It must be temporarily stored in the lagoon, before being irrigated onto cultivated lands, in accordance with the stipulations of the NWA and international Best Practice regarding the application rate of Nitrogen per hectare per annum.
- The effluent management system for the piggery must be a completely contained and closed system.

	<ul style="list-style-type: none"> • Should there be any breakdown of the components of the effluent management system, service providers are in close enough proximity and competency to have the system up and running within a day. If maintenance work is in process, the proponent must not pull any plugs on the piggery buildings, which allows for storage of 5-6 weeks in collection pits under the slatted floors. • All runoff from 'dirty' surfaces (i.e. pig houses, passages, composting platform) must be directed into the Effluent Management system. • There must be a concrete slab at the separator and solids bunker site, which allows any seepage / runoff from the solids to feed back into the Effluent Holding sump. • All 'clean' runoff from roofs, would remain separate to the dirty. • There must be no dirty runoff existing the site in an uncontrolled manner.
<p>Impacts on 'sense of place' due to indiscriminate fly, odour, visual management.</p>	<p>Fly management Flies should be of minimal nuisance due to the following operation factors –</p> <ul style="list-style-type: none"> • All the manure under the slatted floors is submerged in liquid (urine and water), making it impossible for flies to lay; • The small amount of manure in the separator sump is stirred regularly, preventing laying; • The solids, post separator, are removed regularly; • Once the solids are laid out for composting, it will be too hot for fly larvae to survive (composting process). <p>Odour management Odour on the farm is agricultural in nature and consistent with livestock enterprises such as milk and pork production. Management measures are implemented to try to reduce odour as is practical in order to reduce offense to neighbours, as follows -</p> <p><u>Piggery buildings</u></p> <ul style="list-style-type: none"> ○ The piggery buildings must be kept clean and well ventilated since bad odours build up when there is poor or inadequate ventilation. ○ Excessive build-up of manure within piggery houses and below the floor area is avoided by frequent flushing (pull-plug) of effluent from the houses into effluent sumps. <p><u>Effluent sumps</u></p> <ul style="list-style-type: none"> ○ Effluent is not stored in sumps for long periods (maximum of 3 months), therefore eliminating the odour as a result of aerobic decomposition. ○ Effluent sumps are regularly inspected to ensure there is no leaks or overflow of effluent. ○ Sufficient freeboard is available to ensure storage integrity during heavy rainfall events. <p><u>Irrigation of liquid effluent wastewater to cultivated lands</u></p> <ul style="list-style-type: none"> ○ Liquid effluent (after separation) from the Effluent Lagoon must be distributed onto cultivated lands via travelling irrigation guns. ○ Pumping occurs regularly, as weather conditions permit. ○ Irrigation must be avoided on windy and wet days. ○ Irrigation must be avoided on weekends and public holidays, as far as possible. ○ All irrigation must be conducted on a rotational basis so as to avoid soil nutrient loading leading to toxic levels. <p><u>Composting</u></p> <ul style="list-style-type: none"> ○ The solid fraction of the effluent must be stored on an impermeable surface that is properly drained, with drains leading back to the effluent sump. ○ Carbon (in the form of straw) must be added to the solid fractions to obtain the correct C: N balance. ○ When composting is occurring effectively, there is no odour. <p><u>Disposal of livestock carcasses</u></p> <ul style="list-style-type: none"> ○ Mortalities must be stored in enclosed areas prior to being taken to the composting area. ○ Disposed carcasses will be completely buried in the compost, thus escaping odour is minimal.

	<p>Visual management</p> <p>In order to reduce the visual impacts of the proposed piggery to the Hoby Point boating area of Midmar Dam, the proponent must make considerations for design and aesthetics where possible, as follows –</p> <ul style="list-style-type: none"> ○ The roofs of the pig houses must be painted green. ○ If required, a screen of indigenous trees / hedge on the northern side of the piggery unit must be planted.
Secondary risks	
Impacts of poor stormwater management (water contamination and soil erosion)	<p>Stormwater management</p> <p>The piggery must employ best practise stormwater management, as follows –</p> <ul style="list-style-type: none"> • Rainwater must be captured from the piggery roofs and collected in the existing dam / JoJo tanks; • Clean stormwater from the piggery (e.g. roofs, road surfaces) must drain to stormwater grassed swales / natural drainage lines and contours and be dispersed over grassed, flat areas; • Clean stormwater must not be directed to the effluent management system as this would increase effluent volumes that need to be managed; • All clean and dirty stormwater effluent must remain separate and be treated separately; • Energy dissipating measures with regards to stormwater outflow points must be installed where necessary to prevent soil erosion. • All drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream, of any stormwater discharge points.

13.2 Balance of Impacts

The following tables reflects a summary of the positive and negative impacts and risks of the proposed activity.

Table 11 Summary of positive and negative impacts

	Positive impact	Negative impact
Expansion of piggery	<ul style="list-style-type: none"> • Improved agricultural productivity. • Increased efficiency of land use. • Potential contribution to local economy. • Creation of job opportunities for skilled personnel (e.g. architect, engineer, piggery consultants, etc.). • Provision of temporary job opportunities during the Construction Phase (for engineers, labourers etc.). • Skills development of the local community through employment opportunities. • Revenue for local businesses supplying the contractors (i.e. construction materials). • Adequate distance from existing piggery - improved biosecurity: breeders / weaners. • Improved animal welfare of pig production. • Economic support for additional families as new permanent employment opportunities would be created. 	<ul style="list-style-type: none"> • Proximity of expansion site to Midmar Nature Reserve-impact on sense of place. • Pollution if construction activities are not properly managed (e.g. oil / fuel spills, litter from personnel on-site, sewage from ablutions etc.). • Hardened surfaces created during construction would increase the amount of stormwater runoff. • Odour nuisance due to the additional pigs onsite. • Fly nuisance due to the number of pigs. • Increased potential for watercourse contamination through overflow of effluent storage sump and/or spreading of pig effluent on croplands.
No-go	<ul style="list-style-type: none"> • No impact on sense of place to to Midmar Nature Reserve. • Stormwater run-off would not be altered, and thus the erosion rates would not be altered. • No increase in odour or noise nuisance would be evident. 	<ul style="list-style-type: none"> • No expansion to the Mount Ashley Farming enterprise. • No improvement in agricultural productivity. • No increase in the efficiency of land use. • No improvement in quality of life for farm residents through reduced poverty.

	<ul style="list-style-type: none"> • No increase in fly nuisance would be evident. • Reduced potential for watercourse contamination through overflow of effluent storage sump and/or spreading of pig effluent on croplands. 	<ul style="list-style-type: none"> • No potential contribution to local economy. • No further employment opportunities would be created. • No benefits for local building material suppliers or machinery hire companies
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13.3 Proposed monitoring and auditing schedule

Upon commencement of construction (includes site establishment) of the piggery, an Environmental Control Officer (ECO) should be appointed to conduct audits (based on the conditions of the Environmental Authorization and approved EMPr) of the **site monthly for the duration of the construction phase**. Audit reports should be compiled after every visit and submitted to the DEDTEA: Compliance, Enforcement and Monitoring Unit and the DWS.

During operation of the new piggery expansion development, the ECO should continue to conduct **operational audits every 6 months for the first two years of operation**. Audit reports should be compiled after every visit and submitted to the DEDTEA: Compliance, Enforcement and Monitoring Unit and the DWS.

The **Water Quality Monitoring Plan**, as outlined in section 9.11.1, must be implemented.

13.4 Proposed conditions of the Environmental Authorization

Considering all information gathered in the EIA process – including the project details, the site, the need and desirability, relevant environmental legislation, engineering input and comments from IAPs - the EAP makes the following recommendations that should be included as conditions of Environmental Authorization:

Impacts on water quality due to indiscriminate solid waste and effluent management

- Dead pigs – The dead pigs must be disposed of via composting.
- The carcasses must be included into the effluent solids composted manure where rapid decomposition takes place over a period of 6 weeks.
- Medicinal waste – general waste (packaging / plastics) must be recycled or disposed of with general farm waste (landfill / buried).
- Old vaccination vials and syringes must be disposed of into a designated container, and returned to the veterinary wholesaler for safe disposal. There must be no medicinal waste entering the effluent management system.
- An appropriate number of temporary, chemical toilet facilities must be provided for labourers during the construction phase: at least 1 toilet for every 20 workers.
- The toilets must be positioned a minimum of 100m away from any water resources.
- The toilets must be maintained in a satisfactory condition.
- Effluent from staff ablutions (showering and toilet) – managed via a septic tank and soakaway system.
- Soakaway must be positioned more than 150m away from watercourses.
- Pigs must be housed on fully slatted floors in all pig houses that allows manure, water and urine waste to fall through into collection pits below each pen.
- The effluent must be pumped into a solids separator (screw-press system) which would separate out all solids from liquid fraction in the effluent.
- The solids must be collected into a concrete bunker, before being moved into windrows on a composting platform.
- The liquid fraction of the effluent must be piped from the Separator into a lined Effluent Storage lagoon.
- It must be temporarily stored in the lagoon, before being irrigated onto cultivated lands, in accordance with the stipulations of the NWA and international Best Practice regarding the application rate of Nitrogen per hectare per annum.
- The effluent management system for the piggery must be a completely contained and closed system.
- All runoff from 'dirty' surfaces (i.e. pig houses, passages, composting platform) must be directed into the Effluent Management system.
- There must be a concrete slab at the separator and solids bunker site, which allows any seepage / runoff from the solids to feed back into the Effluent Holding sump.
- All 'clean' runoff from roofs, would remain separate to the dirty.
- There must be no dirty runoff existing the site in an uncontrolled manner.

Impacts on 'sense of place' due to indiscriminate fly, odour, visual management

- Flies should be of minimal nuisance due to the following operation factors –
 - All the manure under the slatted floors is submerged in liquid (urine and water), making it impossible for flies to lay;
 - The small amount of manure in the separator sump is stirred regularly, preventing laying;
 - The solids, post separator, are removed regularly;
 - Once the solids are laid out for composting, it will be too hot for fly larvae to survive (composting process).
- The piggery buildings must be kept clean and well ventilated since bad odours build up when there is poor or inadequate ventilation.
- Excessive build-up of manure within piggery houses and below the floor area is avoided by frequent flushing (pull-plug) of effluent from the houses into effluent sumps.
- Effluent must not be stored in sumps for long periods (maximum of 3 months), therefore eliminating the odour as a result of aerobic decomposition.
- Effluent sumps must be regularly inspected to ensure there is no leaks or overflow of effluent.
- Sufficient freeboard must be available to ensure storage integrity during heavy rainfall events.
- Liquid effluent (after separation) from the Effluent Lagoon must be distributed onto cultivated lands via travelling irrigation guns.
- Pumping occurs regularly, as weather conditions permit.
- Irrigation must be avoided on windy and wet days.
- Irrigation must be avoided on weekends and public holidays, as far as possible.
- All irrigation must be conducted on a rotational basis so as to avoid soil nutrient loading leading to toxic levels.
- The solid fraction of the effluent must be stored on an impermeable surface that is properly drained, with drains leading back to the effluent sump.
- Carbon (in the form of straw) must be added to the solid fractions to obtain the correct C: N balance.
- Mortalities must be stored in enclosed areas prior to being taken to the composting area.
- The roofs of the pig houses must be painted green to reduce visual impacts.
- If required, a screen of indigenous trees / hedge on the northern side of the piggery unit must be planted.

Impacts of poor stormwater management (water contamination and soil erosion)

- Rainwater must be captured from the piggery roofs and collected in the existing dam / JoJo tanks.
- Clean stormwater from the piggery (e.g. roofs, road surfaces) must drain to stormwater grassed swales / natural drainage lines and contours and be dispersed over grassed, flat areas.
- Clean stormwater must not be directed to the effluent management system as this would increase effluent volumes that need to be managed.
- All clean and dirty stormwater effluent must remain separate and be treated separately.
- Energy dissipating measures with regards to stormwater outflow points must be installed where necessary to prevent soil erosion.
- All drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream, of any stormwater discharge points.

13.5 Reasoned opinion of EAP on Environmental Authorization

If the development proceeds in the manner outlined in this report, with adequate compliance, enforcement and monitoring, it is the opinion of the EAP that the -

Proposed expansion of a piggery on Mount Ashley Farm, on Remainder 941 of the Farm Groot Vallei near Midmar Dam, Umngeni Local Municipality, uMgungundlovu District of KwaZulu-Natal

- should be granted Environmental Authorization.