

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the proposed expansion of Ncholo's covenant farm Piggery on portion 2 of the farm Brandbach 471 JR, City of Tshwane, Gauteng.

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Abbreviations

BA	Basic Assessment
BID	Background Information Document
CI	Conservation Importance
IMP	Imperatrix (Pty) Ltd
DEA	National Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EAPs	Environmental Assessment Practitioners
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
DRDLR	Department of Rural Development and Land Reform
DEA	Department of Environmental Affairs
I&AP	Interested and Affected Party
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
NWA	National Water Act (Act 36 of 1998)
NEM: AQA	National Environment Management: Air Quality Act (Act 39 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:WA	National Environmental Management: Waste Act
NHRA	National Heritage Resources Act (Act 25 of 1999)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

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Attached Appendices

APPENDIX A:	Site plan(s)
APPENDIX B:	Photographs
APPENDIX C:	Facility illustration(s)
APPENDIX D:	Services reports
APPENDIX E:	Public participation information <ul style="list-style-type: none">• Appendix E.1 – Proof of site notice• Appendix E.2 – Written notices issued as required in terms of the regulations• Appendix E.3 – Proof of newspaper advertisements• Appendix E.4 – Communications to and from interested and affected parties• Appendix E. 5 - Comments and Responses Report• Appendix E.6 – Copy of the register of I&APs
APPENDIX F:	SAHRA information, service letters
APPENDIX G:	Specialist reports
APPENDIX H:	EMPr
APPENDIX I:	Other information

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1. INTRODUCTION

Department of Rural Development and Land Reform is proposing to establish an Expansion of existing piggery from 120 Sow to 1000 Plus sow piggery on a portion of Ncholo Covenant Farm located at Cullinan area and under the Jurisdiction of Tshwane Metropolitan. The proposed project will cover an aerial extent of approximately 5 Ha for a development footprint of 1000 sows, 7 Boars, 86 Breeding, 272 for farrowing, 1760 piglets, 3255 weaners, 4501 Growers and 2251 Finishers. In order to realize this project an environmental impact assessment (EIA) process must be undertaken by the relevant applicant and authorised by the Department of Environmental Affairs as prescribed in the National Environmental Management Act. Department of Rural Development and Land Reform has appointed **Imperatrix (Pty) Ltd** as its environmental assessment practitioner (EAP) for this environmental impact assessment process.

This report comprises of the environmental scoping and management plan for the proposed project. The scoping section includes the terms of reference (plan of study) that sets out the proposed approach to the relevant environmental impact assessment, *inter alia*, a description of tasks undertaken for the environmental impact assessment process, an indication of the stages for competent authority consultation, a description of the assessment methodology used and particulars of the public participation process that was followed. Finally, the terms of reference also proposed the relevant investigations for the EIA study. The important aspects that allowed the practitioners to assess the project objectively were:

- Climate;
- Geology;
- Topography;
- Soils;
- Land-use capabilities;
- Hydrology;
- Air quality;
- Natural vegetation; and
- Occupational health and safety

As required in the EIA regulations the components of this report are set out below:

- details and expertise of the EAP who prepared this report;
- description of the proposed activity;
- description of the property on which the activity is to be undertaken and the activity's location on the property;
- description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;

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- description of the property on which the activity is to be undertaken and the activity's location on the property;
- description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- details of the public participation process;
- description of the need and desirability of the proposed activity;
- identified potential alternatives, inclusive of associated advantages and disadvantages;
- indication of the methodology used in determining significance of potential environmental impacts;
- description and comparative assessment of alternatives;
- environmental issues identified during the EIA process, assessments of significance and mitigation measures;
- assessment of identified potentially significant impacts;
- description of assumptions, uncertainties and gaps in knowledge;
- reasoned opinion of whether activity should be authorised and any prescriptive conditions;
- environmental impact assessment scope;
- proposed environmental management plan;
- health and safety issues;
- conclusions and recommendations.

2. ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER'S DETAILS

2.1 Details of Environmental Assessment Practitioner

Imperatrix (Pty) Ltd is a privately owned consultancy company doing various projects in South Africa. Having more than 7 Projects with different sectors, i.e. Roads, Piggery projects, Sewer and Water. Our core services are:

- Environmental Impact Assessment
- Environmental Investigations
- Research and Training
- Feasibility Studies
- Monitoring and Evaluation

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Imperatrix (Pty) Ltd draws its experts from regional university such as University of Venda. Imperatrix declares that we have no interests in this project and are independent and acted as such during the EIA process as required by the EIA regulations. The key team members who carried out this EIA are presented in Table 2.1 below.

Table 2.1: List of experts and their areas of responsibility in the EIA process.

ORGANIZATION	AREA OF RESPONSIBILITY / FIELD OF EXPERTISE	TEAM MEMBERS
IMPERATRIX (PTY) LTD	Project management EIA coordination	Mr. Ronewa Tshibubudze
IMPERATRIX (PTY) LTD	EIA process	Mr. Ronewa Tshibubudze
PROPONENT	Developer/Client	Department of Rural Development and Land Reform.
IMPERATRIX (PTY) LTD	Legislation & Policy Review	Mr. Ronewa Tshibubudze
IMPERATRIX (PTY) LTD	Development of Environmental Management Plan (EMP)	Mr. Ronewa Tshibubudze
IMPERATRIX (PTY) LTD	Public Consultation and Facilitation	Mr. Ronewa Tshibubudze Ms. Thabiso Khumalo

2.2. Project Description and Location

Department of Rural Development and Land Reform is expanding up infrastructure for a 1000 sow piggery unit on portion 2 of the farm Brandbach 471 JR currently having at least 300 Ha of land occupied by the following:

- Existing approximately 100 Sow Piggery
- Feedlot;

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- Existing Buildings nor Infrastructures. I.e. A church and Its Associated infrastructures.

The farm is located at Cullinan, approximately 10.5km from cullinan centre. There is an existing gravel road (Brandbach Gravel Road) connecting the plot earmarked for the piggery project and the controlled main access to the farm. The proposed infrastructure are as follows (See Appendix C):

- Piggery office
- Stock Room
- 16x Sheds
- 2x Silos
- Whey Dam
- Water Tank (1000KL)
- Slurry Dam/Sewage
- Temporary Dead Animal & Waste storage Disposal Area (Awaiting service provider (Waste Group) to collect and dispose on a registered landfill site)
- Sawdust Housing
- Showers and Security point
- Canteen Area

The pigs are housed in fully slatted floors. No bedding or sawdust is used. The manure (solids and liquids) excreted by the animals falls through the slatted floor. The manure is temporally stored under the slatted floor in an effluent holding pit until the “flushing plug” is opened daily to release the effluent, which it will flows in a pipe to a slurry sump. It is then pumped from the slurry sump through a fixed separator which separates any solids from the sludge. The liquid is pumped to a holding pond to be recycled while the solids are concentrated and composted, and then sold to local farmers as manure.

The pigs will produce 28,000 litres of effluent per day. The effluent is a mixture of faeces, urine, and wash water. This effluent is separated into solids and liquids, using a rotary or static separator. The solids are loaded to a large compost heap, where it is broken down by various microorganisms to produce a nutrient-rich organic material which is used to grow feed crops and citrus on the farm. The liquid will be transferred to a newly planned reservoir.

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Liquid from the reservoir is recycled back to the pig pens, and is flushed under the slatted area where they are kept. It gathers faeces and urine again, and goes through the separator, eventually ending in the reservoir. Some liquid evaporates, and is replaced with water from a nearby borehole. Pig mortalities estimated to be between 1,000 and 2,000 kg/month are expected at the facility and will be dealt with by donating the carcasses to lion parks or burial on a portion of land within the facility.

The process involved can be summarized as follows (See attached Appendix C: Waste flow Chart):

1. Slurry is removed from the building by way of 315mm class 4 drain pipes.
2. Slurry is then deposited in a slurry pump sump with a capacity of 78m³.
3. The slurry sump is 1m higher than the slurry pipes to prevent spill.
4. From this sump the slurry is pumped with a slurry pump with a capacity of 45m³ per hour to a fixed separator with a capacity of 50m³ per hour.
5. The separator filters solids from the slurry through a screen of 250 microns.
6. The screened water is then deposited into the water storage dam with 1,000m³ volume.
7. The solid is deposited on a concrete slab and composted.
8. The water is recycled i.e. used to flush the pig pens again.

Pigs that die are rendered or incinerated at a facility on an out sourcing arrangement in which the Proponent will be paying for the disposal services rendered to Waste Group.

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NEMA Listed Activities Triggered

The NEMA EIA Listed Activities (as per the NEMA EIA Regulations Listing Notices 1, 2 and 3 of 2017) that will most likely be triggered by the proposed project are listed in the table below.

Listed Activity	Project Activity / Component
Government Notice Regulation No. 327 of 2017 (Listing Notice 1)	
Activity 3 (ii)	3 (ii) The development and related operation of facilities or infrastructure for the slaughter of animals with a production throughput of- (ii) reptiles, game and red meat exceeding 6 units per day
Activity 4 (a)(i)(ii) b	4 The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed- (i) 20 square metres per large stock unit and more than 500 units per facility; (ii) 8 square meters per small stock unit and; (b). more than 250 pigs per facility excluding piglets that are not yet weaned;
Activity 39	The expansion and related operation of facilities for the concentration of animals for the purpose of commercial production in densities that will exceed- (i) 20 square metres per large stock unit, where the expansion will constitute more than 500 additional units; (ii) 8 square meters per small stock unit, where the expansion will constitute more than; (b) 250 additional pigs, excluding piglets that are not yet weaned;
Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

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3. DESCRIPTION OF THE ENVIRONMENT

3.1. Topography

Topography The property is situated on the eastern foothills of the Magaliesberg range, and located at an altitude of ± 1440 mamsl. The surrounding area is typically rolling hills with undulations of ± 100 m between local hill rises and valleys.

The local topography has been significantly altered by mining and farming activities. Farming, which started in the early part of the previous century. Within the local valleys, artificial impoundments have been constructed to assist in the management of surface water pollution within the farm.

3.2. Geology and Hydrology

Geology According to the geological map for the area, the development occurs within the Main Zone of the Bushveld Complex (Council of Geoscience, www.geoscience.org.za). The Bushveld Complex is comprised of large masses of Waterberg Conglomerate with diamond bearing Kimberlite volcanic pipes. The Kimberlite is situated within the stable 3-billion-year-old Kaap-Vaal Craton and intrudes rocks of the Transvaal Supergroup (Pretoria and Rooiberg Groups), Bushveld complex and the younger Waterberg Group. The Bushveld complex is the largest known layered mafic intrusion on earth and covers an area extent of some 65 000 km², attaining a thickness of between 7-9 km. Its age is estimated to be 2 billion years. The mafic rocks of the Bushveld complex were emplaced discordantly into the Transvaal Supergroup, forming horse-shoe shaped belts of mafic rock outcrop. These outcrops surround an acidic central region, consisting of felsite, intrusive granophyres and postbushveld granites. In the south, between the eastern and western limbs of the complex and in the Bethal limb, younger sedimentary cover and intrusions dominate at surface. It is in this region that the Cullinan Kimberlite occurs, along with 11 other Kimberlite diatremes in the Cullinan-Rayton area.

3.3. Climate

Climate The development is located in a typical Highveld climatic region, with warm to hot summers, moderate winters and rainfall that are higher than that of most parts of the country. Rainfall occurs mostly in the form of thunderstorms. Based on the temperature and rainfall distribution during the summer, the most likely period for vegetation growth would be in the months of October to March.

The Cullinan area receives most of its rainfall in the summer months between October and March. Cullinan experiences dry winter months.

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The highest maximum temperatures are from November to March, with December a maximum average of 24.5°C and February 24.3°C. The lowest minimum temperatures are from May to August, with July a minimum average of 4.2°C and June 4.8°C.

What extreme weather is concerned: hail, snow and fog are not regular occurrences in the Cullinan area. However, thunderstorms are frequent and provide a large part of the rainfall to the area.

The highest average wind speed is in September being 1.5m/s with the highest wind speeds in September being 14.95m/s. The average annual wind direction is in a westerly direction, the average summer wind direction is in north-easterly direction and in winter in a westerly direction.

3.4. Soil

The planned development is situated within the greater mining area of Cullinan Diamond Mine, which is situated on a generalised soil pattern described as red, yellow and/or greyish soils with low to medium base status. South facing slopes of the quartzite koppies have shallow gravel and sandy soil. North facing slopes have shallow stony soils. Ridge area has shallow, sandy soils with a rock cover of 60%. Topsoil is found and the crushed rock is approximately 7.5mm in diameter. Protea caffra ridge veld is predominantly found on southing facing slopes of quartzite ridges where there is shallow gravel and sandy soil. Burkea africana ridge veld vegetation type occurs mainly on north facing quartzite slopes where there are shallow stony soils.

The proposed development is located within the Ba6a land type. According to the land type memoir the soils in the greater area are comprised primarily of Hutton, Avalon, and Bainsvlei. The soil pattern identified in the Cullinan Area falls is best described as a Highveld Plinthic Catena.

The underlying geology in the area adjacent to the kimberlite pipe consists predominantly of quartzite of the Pretoria Group, Transvaal Sequence. Over most of the area, the quartzite occurs as outcrops surrounded by shallow colluvial horizons.

3.5. Vegetation

The regional area under investigation forms part of the Grassland and Savanna Biome. Each biome comprises various vegetation types. The Grassland Biome is represented by Rand Highveld Grassland in this specific case, and the Savanna Biome by Marikana Thornveld. It was found that the bulk of the site conformed to the Marikana Thornveld vegetation type, as the vegetation along the ridge and the road is

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distinctly more thornveld than grassland. Information from the Precis database also indicates that the 464 plant species that occur in the quarter degree grid lean more towards the Thornveld than grassland. However, for completeness both the vegetation types are described below.

Rand Highveld

Grassland Rand Highveld Grassland is found in the highly variable landscape with extensive sloping plains and ridges in the Gauteng, North-West, Free State and Mpumalanga Provinces. The vegetation type is found in areas between rocky ridges from Pretoria to Witbank, extending onto ridges in the Stoffberg and Roossenekal regions as well as in the vicinity of Derby and Potchefstroom, extending southwards and north-eastwards from there.

The vegetation is species rich, sour grassland alternating with low shrubland on rocky outcrops. The most common grasses on the plains belong to the genera Themeda, Eragrostis, Heteropogon and Elionurus. High numbers of herbs, especially Asteraceae are also found. In rocky areas shrubs and trees also prevail and are mostly *Protea caffra*, *Acacia caffra*, *Celtis africana* and *Searsia* (previously *Rhus* spp).

This vegetation type is poorly conserved (approx 1 %) and has a target of 24 % of the vegetation type to be conserved. Due to the low conservation status this vegetation type is classified as endangered. Almost half of the vegetation type has been transformed by cultivation, plantations, urbanisation or dam-building. Scattered aliens (most prominently *Acacia mearnsii*) are present in the unit. The final section of the re-alignment falls in this vegetation type.

Marikana Thornveld

The Marikana Thornveld vegetation type occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. The vegetation type is typified by open *Acacia karroo* woodland occurring in the valleys and undulating plains. Shrubs are denser along drainage lines and it is common for the drainage lines to be infested with aliens.

Marikana Thornveld is considerably impacted, with 48 % of the vegetation type being transformed, mainly due to cultivated and built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land

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transformation. This vegetation type is rated as endangered as only 0.7 % of the unit is conserved. The majority of the re-alignment falls within this vegetation type.

The rapid assessment of the site yielded 62 species. This number comprises of 24 grasses, 29 weeds and herbs, one reed, one succulent and ten trees. The species composition is a mixture of common pioneers and weeds mixed with some typical grassland species. This is attributed to the disturbed nature of vegetation along roadsides. This is a result of regular disturbance and some regrowth of natural vegetation. There are a high number of medicinal species (11) found primarily on the un-impacted part of the site.

Fauna

The habitat in and around Cullinan can be described as savannah and grassland. These habitats have been largely disturbed but several game farms in the area conserve the natural habitat and the species that occur there.

The Cullinan area has a large variety of species, most naturally occurring with some species that have been reintroduced to the area. This includes 155 insect families, 24 spider families, 195 Bird Species, 22 reptile families, 17 terrestrial small mammals and 18 Managed Game species (Holgate and Associates, 2004). According to the Precis database a total of 268 animal species can be found in the quarter degree grid.

Cullinan has introduced some game to the Game Reserve where others were naturally occurring in the vicinity: Blesbok (*Damaliscus pygargus phillipsi*), Blue Wildebeest (*Connochaetes taurinus*), Bushbuck (*Tragelaphus sylvaticus*), Bushpig (*Potamochoerus porcus*), Common Duiker (*Sylvicapra grimmia*), Giraffe (*Giraffa camelopardalis giraffa*), Impala (*Aepyceros malampus*), Kudu (*Tragelaphus imberbis*), Mountain Reedbuck (*Redunca fluvorufula*), Nyala (*Nyala angasiiv*), Red Hartebeest (*Alcelaphus caama*), Steenbuck (*Raphicerus campestris*), Tsessebe (*Damaliscus lunatus lunatus*), Vervet Monkey (*Chlorocebus pygerythrus*), Warthog (*Phacochoerus africanus*), Waterbuck (*Kobus ellipsiprymnus*) and Burchell's Zebra (*Equus quagga*, formerly *Equus burchelli*).

The faunal survey consisted of a site walk-through for the duration of the site visit. No trapping of animals was undertaken. The fauna on site was very limited as was to be expected that close to an existing high

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traffic volume road. A total of 7 bird species were observed with no mammal, amphibian or reptile sightings.

All of the species observed were common bushveld species including Cape Wagtail, Crowned Lapwing (Plover), Cape Turtle Dove, Crested Barbet, Blackeyed Bulbul, Masked Weaver and Red Bishop. The habitat adjacent to the existing road comprises mainly of disturbed thornveld. As discussed above a number of common birds were found on site, but due to a number of developments adjacent to the road no larger fauna is expected.

Surface Water The proposed development is located in the upper region of the Stream. This water body, together with the Premiermyloop, form part of the upper Pienaars river catchment area (A23B).

This specific catchment area where the proposed development is to take place, comprises largely of natural vegetation and parts of the Cullinan Town, is approximately 422ha in size, with the minimum runoff calculated as 125 000m³/year and a maximum of 157 000m³/year (Golder, 2005:26). Runoff from this catchment can be categorised as being clean water.

The Stream is a non-perennial stream that only flows in the wet season with significant flow occurring for about 4 months a year with an average of more than 30 000m³ per month. This stream originates southeast of the Cullinan Diamond Mine open pit area between the R513 road and Samabula Game Lodge.

The Stream forms part of the Cullinan Diamond Mine's surface water monitoring programme, with quarterly samples analysed. The annual average salinity for the Stream did not exceed the TWQGR for irrigation with total dissolved solids (TDS) concentrations. The suspended solids exceeded the TWQGR for irrigation for the year 2006. The Manganese concentrations recorded during 2005 & 2006 exceeded the TWQGR for irrigation and aquatic ecosystems. All other chemical results were below TWQGR levels for irrigation, livestock watering and aquatic ecosystems.

Wetlands and other surface water features Wetlands The riparian zone and wetlands were delineated according to the Department of Water Affairs and Forestry (DWAF) guideline, 2005: A practical guideline procedure for the identification and delineation of wetlands and riparian zones. According to the DWAF guidelines a wetland is defined by the National Water Act as: "land which is transitional between terrestrial and aquatic systems where the water table is usually at or near surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil."

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In addition, the guidelines indicate that wetlands must have one or more of the following attributes: Wetland (hydromorphic) soils that display characteristics resulting from prolonged saturation; The presence, at least occasionally, of water loving plants (hydrophytes); and A high water table that results in saturation at or near surface, leading to anaerobic conditions developing in the top 50 centimetres of the soil.

During the site visit the following indicators of potential wetlands were investigated: Terrain unit indicator; Soil form Indicator; Soil wetness indicator; and Vegetation indicator.

Riparian Areas According to the DWAF guidelines a riparian area is defined by the National Water Act as: "Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas"

The difference between Riparian Areas and Wetlands According to the DWAF guidelines the difference between a wetland and a riparian area is: "Many riparian areas display wetland indicators and should be classified as wetlands. However, other riparian areas are not saturated long enough or often enough to develop wetland characteristics, but also perform a number of important functions, which need to be safeguard. Riparian areas commonly reflect the high-energy conditions associated with the water flowing in a water channel, whereas wetlands display more diffuse flow and are lower energy environments."

Delineation

The site was investigated for the occurrence of wetlands and riparian areas, using the methodology described above and described in more detail in the DWAF guidelines.

Terrain Unit Indicator The terrain on site varies from 1 520 mamsl to 1 420 mamsl. The site is located on the edge of the Magaliesberg range with the dominant terrain units on site being the crest unit. According to the DWAF guidelines the valley bottom is the terrain unit where wetlands are most likely to occur, but they are not excluded from any of the other terrain units

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Groundwater A borehole and hydro census was conducted within a 15km radius of the mining area for the purpose of updating the Environmental Management Programme Report and Geohydrological studies. The information for this Basic Assessment was drawn from that assessment. Some 19 boreholes were sampled for groundwater levels, yields and quality analyses. Additionally, borehole data has been acquired from the National Groundwater Database of the Department of Water and Sanitation to supplement yield and water level data and provide geological drilling logs and water spikes.

In general water levels in the area mimic the surface topography. Water level elevations measured in the observation boreholes are correlated with the corresponding surface elevations. The data indicates that there is a strong correlation of 99% between the topography and the water levels.

Rest Water Levels (RWL) is the depth at which groundwater recharge after drilling. Drilling depths for all monitoring boreholes vary between 18m-49m below surface. Water strike depths vary between 16m-44m below surface. Rest water levels vary between approximately 1m & 10m below surface. The monitoring borehole closest to the proposed development site has a depth of 25m and RWL of 4.25m, with a blow yield of 50 l/hr.

According to historic water quality monitoring results for the borehole closest to the proposed development, the average quality in terms of Total Dissolved Solids (TDS), Chloride (Cl), Sulphate (SO₄), Nitrate (NO₃), Sodium (Na) and Fluoride (F) all falls within the WRC (1998) Class 0 = Ideal.

Air Quality

The proposed development site and the greater Cullinan village was previously identified as a site that may be potentially impacted on by air pollution generated by Cullinan Diamond Mine (as it lies within 3km from the source). However, fall out dust samples taken and analysed by the mine over a prolonged period indicated that potential pollution was negligible in this area.

Noise

Noise incurred at the study site emanates primarily from road traffic on the road directly adjacent to the site as well as mining related noise from the Cullinan Diamond Mine surface treatment plant, main underground ventilation fans (South Fan) and underground ring-blasting activities and with regards to the proposed activities less noise is expected.

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In order to determine the background noise of the area the latest noise survey, from Cullinan Diamond Mine was used. Noise is measured in terms of the National Environmental Management: Air Quality Act No 39 of 2004.

Visual

The skyline to the north, east and west of the area is dominated by infrastructure associated by mining (i.e. ore stockpiles, electricity supply pylons and Coarse Tailings Facilities) while the southern skyline consists out of rolling hills contained in undeveloped open space and game farms.

Protected areas and conservation planning

There are no declared protected or conservation planning areas in the vicinity of the planned development area. Game farms in the area are all privately owned and managed.

Cultural Heritage

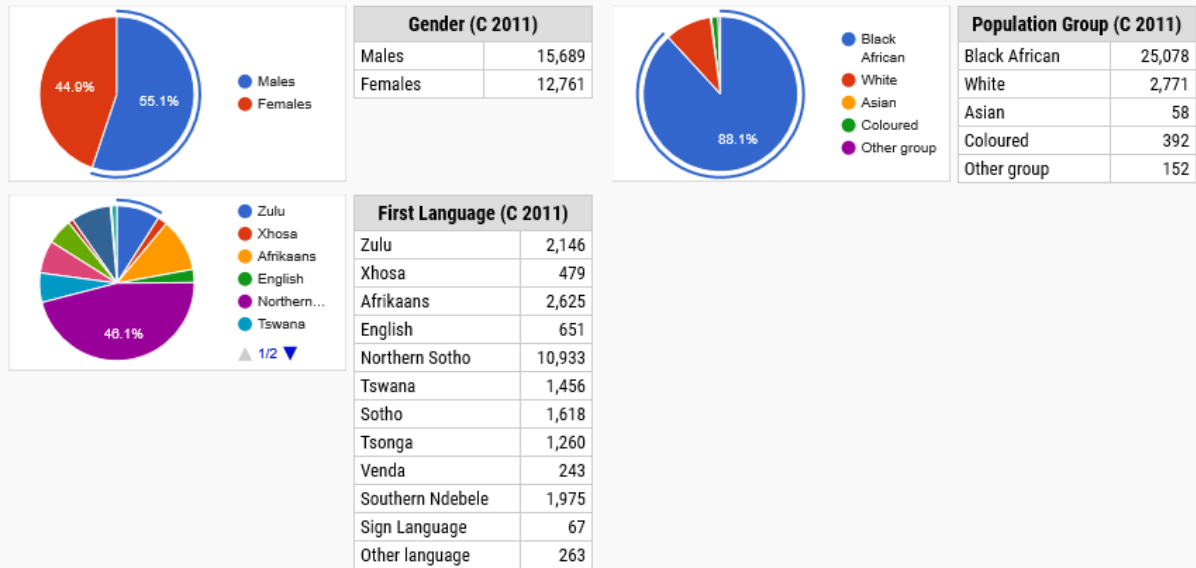
It is known that Major Thomas Cullinan had purchased the property from the Prinsloo family, cattle ranchers, in 1902 after the first Boer War. It is therefore assumed that the land was previously classed as grazing land used for livestock production as well as sparse and small rural settlements. Subsequently the area was used as part of farming activities.

Currently the proposed development site is located next to the access road to Cullinan (provincial road) within the road reserve. On the western side of the site is located, what is called, the Minnaar Graveyard.

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Regional socio-economic structures/ Demographics

Further information about the population structure:



The local Municipal areas are influenced by the demographic and socio-economic trends of areas such as Tshwane Metropolitan Municipality. The local Municipal area has been described as predominantly rural in nature, lacking services, with high unemployment, high levels of poverty, but large areas of potential agricultural, recreation and tourism development.

The Cullinan area present the following demographic profile:

- A largely poor community with a very large (70%) poor majority;
- The age distribution represents a population with a very large number of young people between the ages of 19 and 59;
- The number of females to male is almost equal;
- The education levels in the Municipality are very poor with a very few people having passed matric and gained tertiary education; and
- The income levels in the Municipality are very low with the majority of people living below an income of R1 200 per month.

The area can be considered a diamond-mining hub and Cullinan owes its existence to the discovery of the world's largest cut diamond. The existence of the Cullinan Diamond Mine and its history has served as an important catalyst for tourism development in this area. Relative isolation as far as the pressures

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of urbanization is concerned as well as its significant recreation, heritage and conservation assets is seen to contribute to its tourism potential.

4. PUBLIC CONSULTATION

4.1. Public Consultation Process

Public participation forms an integral part of any present day environmental assessment process. The objectives of public participation can be summarised as follows:

- informing stakeholders;
- sharing of views, concerns and values;
- minimising risks and maximising on potential benefits;
- influencing project design;
- obtaining local knowledge useful in the project planning phase;
- creating buy-in from the public and stakeholders;
- transparency and accountability in decision-making; and
- Reducing conflict (decision-making through consensus).

4.2. Summary of Issues Raised During the Public Meeting

Table 4.2.1: Issues and / or concerns raised during the public consultations and actions taken / recommended.

PUBLIC PARTICIPATION PHASE				
ACTION	Announcement of Project	Public Notification	Public / Stakeholder meetings	Public review & comment period
Site	Meeting project manager	He explained the project to us and he showed us the site	He explained the wards involved as much as possible.	-
DESCRIPTION	Newspaper Advertisement	placement of site notices.	No meeting was called as the advert and letters were issued to all the neighbours.	Newspaper Advertisement

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PUBLICATION/PLACE	Streek News Newspaper	Several A3 size site notices were placed at strategic points within the area. Post-delivered notices (A4 size) including Background Information Document (BIDs) were distributed to I&APs.		Hard copies of the Draft BA report distributed to relevant stakeholders. i.e. Gauteng Department of Agriculture and Rural Development, Department of water and sanitation, City of Tshwane Metropolitan Municipality & Department of Rural Development and Land Reform.
DATE	7 th Feb 2020	16 th January 2020 23 rd January 2020		26 th February 2020

Action Taken By an EAP	Date	Response
Email Was sent to Key stakeholders by the 14 th January 2020	14 th January 2020 & 17 th January 2020 23 rd January 2020	National Roads Agency Responded that the don't have objection on the project as is not affecting the national Road.
Letters were posted to all the Nearby landowners through post office by the 23 rd January 2020		No comments or Objections received up to date.
Site notices place on strategic place on site by the 16 th January 2020	16 th January 2020	No comments or Objections received up to date.
Newspaper Advert was placed on Streeknews by the 7 th February 2020	7 th February 2020	No comments or Objections received up to date.
Draft Basic Assessment Reports were distributed to key Stakeholders for Review by the 26 th February 2020.	26 th February 2020	Still pending Comments.

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4.3. Need and Desirability of the Proposed Project

4.3.1. Relevance of economic viability

Uncertainties or substantial fluctuations in production levels, or the actual failure of resource projects, potentially create adverse social and environmental impacts. This is particularly so in the case of large scale projects involving major supporting physical and social infrastructure. Therefore, the analysis of the broad economic viability of a project forms a relevant important component of an environmental impact assessment.

In the case of the proposed piggery project, assessing economic viability involves consideration of the forecast demand for pork products, and its anticipated price relative to the proposed investment in its production. However, for this project fluctuations in the rate of production will have only a minor impact on the socioeconomic structure of the region, compared with larger resource projects that involve the establishment of townships and the provisions of a wide range of support services. The proposed project places minimal demands on government services and the interaction with the local community will be relative modest and predominantly beneficial.

4.3.2. Economic and non-economic benefits and costs

Social and economic impacts of the proposed piggery project forms part of the environmental impact assessment undertaken for the project. Naturally new job opportunities will be created at the Ncholo Covenant Farm, coupled with economic benefits to the government and the Cullinan area. Economic costs to the Cullinan community will be minimal, particularly with regard to infrastructure, water infrastructure for the project will be developed on site, and electricity will be drawn from an existing line on the farm.

Significant non-economic benefits can be expected to emanate from increased employment opportunities in skilled and semi-skilled jobs, including the associated training and experience, in the neighbouring community, including social upliftment programmes and through an employment multiplier of about two hundred per cent.

South Africa has a total of about 600 pig producers, most of them i.e. about 500 farmers having between three and 10 pigs making them subsistence farmers. There are about 100 commercial farmers producing about 50 % of pork in the market while the rest is imported from Europe. The pig production sector provides resilience in a dynamic and economically difficult situation for farmers for example the pig sector was never affected during the livestock export and drought challenges experienced in the past years. Farmers are also enjoying the pig protection scheme

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and the Pork Market Share Promotion Scheme. Pig farming remains attractive because of the lower input costs, especially cheaper feeding costs for pigs.

4.4. Assessment of Project Alternatives

4.4.1. The No-Go Option / Consequences of not proceeding

At the moment, South Africa imports at least 50 % of the pork products consumed. Ncholo Covenant Farm will be capable of producing significant quantities and supplying it to the local market. The advantage is that South Africa will save on foreign exchange and local companies will save on the transport costs. Failure to proceed (no-go alternative) will negate these benefits and savings for the country.

The construction phase of the proposed piggery project will create up to jobs in the country. Although many of these newly created job opportunities will occur in the farming industry, additional job creation effects will take place in various other sectors as well; for example, personnel services, transport and equipment manufacturing. There will be no employment benefit if the piggery project does not proceed.

The proposed piggery will generate new income opportunities for the South African government. These incomes derived sources will include:

- indirect government taxes,
- pay as you earn (PAYE) taxes, and
- Company taxes paid to government.

Benefits for not proceeding with the project can be summarised as the following primary benefits:

- the resource will remain in place for possible future development,
- there will be no further visual impact of development,
- there will be no disruption to local communities arising from construction and operation,
and
- there will be no alteration to local biodiversity arising from construction and operation.

4.4.2. Alternative site (s)

The proposed site, a portion of the Ncholo covenant Farm considered for this development is ideal given that it is fairly flat and will not require extensive ground works to erect the required infrastructure. No other potential sites were considered. On the other note it is farther away from the existing farm houses and thus no potential noise or air pollution is foreseen in the context of the existing farm layout.

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4.4.3. Strategic Alternatives

The proposed project site is easily accessible and has all the necessary utilities such as water, electricity and access gravel road which forms part of the farm road network servicing the different sections of the farm. Although there are other pig farms in South Africa the market is still dominated by foreign suppliers. Hence the South African market has a huge opportunity for piggery and the Proponent can potentially apply for infant industry protection from the GRN.

4.5. Technical Alternatives

4.5.1. Waste Management Technologies

Site-specific, nutrient management strategies will be required to prevent and / or minimize potential water pollutants from confinement facilities and land application of manure and organic by-products. Using environmentally safe alternatives to land application of manure should be an integral part of the overall Environmental Management Plan (EMP). These alternative uses are needed in areas where nutrient supply exceeds the nutrient requirements of crops, and/or where land application would cause significant environmental risk. More efficient and cost effective methods are needed for manure handling, treatment, and storage. Options that are available include but are not limited to the following:

- Improved systems for solids removal from liquid manure;
- Improved manure handling, storage, and treatment methods to reduce ammonia volatilization;
- Treatment systems that transform and/or capture nutrients, trace elements, and pharmaceutically active compounds from manure;
- Improved composting and other manure stabilization techniques; and
- Treatment systems to remediate or replace anaerobic ponds.

Modern trends show a shift from municipal treatment methods in the near past to a new body of knowledge with methods adapted to the specific characteristics of these wastes and a different purpose for treatment as detailed below:

Option 1

Is to develop dry systems such as the deep bedding where fresh manure is mixed with a bulking agent or use inclined belts under the slatted floor to separate urine and solids so that all or part of the manure leaving a building is directly handled as a solid.

Option 2

The second option is to improve or retrofit existing liquid systems so that volatile solids and organic nutrients are separated from the fresh manure and transported and/or treated with a variety of technologies to generate value-added products. Solid liquid separation of the raw manure increases the capacity of decision making and opportunities for treatment. The

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separation up-front allows recovery of the organic compounds, which can be used for the manufacture of compost materials and other value-added products or energy production. These products include stabilized peat substitutes, humus, bio-chars, organic fertilizers, soil amendments, and energy. The remaining liquid needs to be treated on the farm. A variety of biological, physical or chemical processes can be used to achieve specific nutrient management goals and environmental standards.

Option 3

A third option is to use anaerobic digesters (AD) to recover methane and energy from the carbon in the liquid manure (EPA, 2012). The biogas recovery systems collect methane from the manure and burn it to generate electricity or heat. Production of biogas from manure using anaerobic digesters is projected to be important worldwide. However, in areas of intensive livestock production, new technologies need to be developed in conjunction with AD to address surplus nitrogen and nitrogen removal and/or recovery of concentrated phosphorus from AD effluents in a form that can be removed from the watershed.

Over and above all it is vital to take heed that nutrients (e.g., nitrogen and phosphorus), manure and wastewater from animal feeding operations have the potential to contribute other pollutants such as organic matter, sediments, pathogens, heavy metals, and ammonia if discharged uncontrollably into the environment.

Anaerobic ponds are widely used to treat and store liquid manure from confined piggery production facilities. However, they have their inherent environmental and health concerns which include emissions of ammonia, odours, pathogens, and water quality deterioration. Thus, there is a major interest in considering various options as much as possible depending on the socio-economic setting. Choice of options should be technically, operationally, and economically feasible, and meet the following five environmental performance standards:

- Eliminate the discharge of animal waste to surface waters and groundwater through direct discharge, seepage, or runoff;
- Substantially eliminate atmospheric emissions of ammonia;
- Substantially eliminate the emission of odour that is detectable beyond the boundaries of farm;
- Substantially eliminate the release of disease-transmitting vectors and airborne pathogens; and
- Substantially eliminate nutrient and heavy metal contamination of soil and groundwater.

4.5.2. Benefits associated with good waste management practices

The quality of the air is improved significantly through the reduction of odours compounds (phenol, p-cresol, p-ethylphenol, indole, and skatole). Substantial animal production advantages can be realized through good manure management practices. Many Researchers have documented with many examples the direct linkage between improved manure management and animal productivity and health. Indicators of better productivity and health were healthier pigs, reduced mortality, increased daily gain, improved feed conversion, and substantial

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economic benefits to the producer. The reuse of cleaner, sanitized water (ammonia free) to refill barn pits reduced ammonia concentration in the air and improved the growing environment. Ambient ammonia levels in the barns dropped an average of 75 percent, from 11.3 to 2.8 ppm. As a result, animal health and productivity were enhanced. Daily weight gain increased 6.1 percent, and feed conversion improved 5.1 percent. Animal mortality decreased 47 percent. Such results are consistent with the substantial animal production advantages that can be realized through good manure management practices in swine production buildings.

Value-added Products

Composting of the separated manure solids is done in a centralized facility where the solids are combined with a rich carbon source to optimize the composting process. The produced composts conserve 95-100% of the nitrogen and other nutrients and meet EPA Class A bio-solids quality standards due to low pathogen levels. The high-quality composts are used for the commercial manufacture of soil amendments, organic fertilizers, and potting soil.

5. LEGAL AND POLCY ENVIRONMENT

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
National Water Act, 1998 (Act No. 36 of 1998) as amended	National	
National Environmental Management: Waste Act (Act no. 59 of 2008,) as amended	National & Provincial	10 March 2009
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	1999
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	2004
Environmental Impact Assessment Regulations, 2017	National	7 th April 2017
DEA Guidelines on Public Participation	National (DEA)	10 October 2012
City of Tshwane IDP	Provincial	2016/2017
National Development Plan	National	2012
National Environmental Management: Waste Act, as amended.	National and Provincial	29 November 2013

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2017, promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.

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National Water Act, 1998 (Act No. 36 of 1998) as amended	Relevant legislation published under this act will be adhered to.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	An application for Heritage Resources review was submitted to SAHRA (Case ID:) in terms and respect of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended (NHRA).
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The fauna and flora that dominate the proposed project site will be assessed in terms of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the relevant legislation published in terms of this act.
Environmental Impact Assessment Regulations, 2017	Please see Chapter 6 relating to public participation, Appendix 1 relating to the content of the Basic Assessment Report as well as Appendix 4 relating to the content of the EMPr.
National Development Plan	<p>The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes to implement the following strategies to address the above goals:</p> <ol style="list-style-type: none"> 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; and 8. Transforming society and uniting the nation.
City of Tshwane Metropolitan SDF	The Spatial Development Framework (SDF) is the legislated component of the municipality's IDP that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The SDF is the municipality's long-term vision of what it wishes to achieve spatially, and within the IDP programmes and projects. The SDF should not be interpreted as a blueprint or master plan aimed at controlling physical development, but rather the framework giving structure to an area while allowing it to grow and adapt to changing circumstances.
Legislation, policy of guideline	Description of compliance

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	The proposed project falls within the identified agricultural zone of the SDP and SDP as such the proposed development will not compromise the integrity of the SDF and IDP.
National Environmental Management: Waste Act, as amended.	An application for a Waste Management License will not be submitted in terms of NEM: WA as the proposed activity pertains to the following activities included in the Act: Category A (1): The waste won't be stored onsite the company will be hired to collect all the waste on site all the times.

6. IDENTIFYING AND ASSESSING POTENTIAL ENVIRONMENTAL IMPACTS

6.1. Assessing the Ncholo Covenant Farm's Proposed 1000 Sow Piggery project

6.1.1. Defining project scope

The goal of this study is to perform an environmental system analysis of the proposed 1000 sow piggery facility at Ncholo Covenant Farm. The purpose of the study is to gain increased knowledge about the environmental impacts of this particular project and to illustrate environmental benefits and disadvantages that are integrated in the production system. The study will also help to illustrate relevant conflicts of interests when different aspects of sustainability are prioritised.

There will be 1000 sows at any one time on the farm and data on the total animals are summarised in the following table.

Table 5.1: Water use and slurry production.

Estimate on water use/requirement and slurry production (water m³ / year)			
	Animals	Drinking	Total
Boars	7	15	105
Breeding	86	12	1032
Early gestation	950	14	13300
Farrowing	272	30	8160
Piglets	1757	1	1757

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Weaners	3255	4	13020
Growers	4501	8	36008
Finishers	2251	11	24761
Cleaning	13079	0.5	6539.5
Grand Total			104 682.5

N.B. Total slurry produced is about 60 000 tonnes per year.

Meat production

The functional unit is *one kg bone-and fat free meat*. This functional unit was selected to measure the final function at the consumer, i.e. the eatable part from meat production. The meat percentage out of the carcass weight is estimated at about 59 %.

Feed consumption

The total feed consumption is presented in table below. The composition of feed rations is shown. It should be observed that the sows' consumption of feed is included per produced slaughter pig and is estimated at 250 kg per slaughter pig maximum.

Manure production and nutrient balances in the stable

The manure production and the nutrient composition of the manure were calculated through balances of input of nutrients in the feed and output of nutrients in the produced pigs. All manure is handled as slurry and the dry matter content of the slurry is 8.8 % (Steineck *et al*, 1999). All the pigs are fed intensively and the manure produced during this time is composted and ultimately applied in the field.

Table 3: Gross nutrient production in manure and feed efficiency.

	N	P	K
Nutrients in manure, kg/slaughter pig	6.9	2.4	2.8
Feed efficiency	0.39	0.25	0.12

Emissions of ammonia

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Emissions of ammonia take place in animal housing, during manure storage. The ammonia losses in the barn are calculated to be 14 % of the excreted nitrogen. If the ventilation system has a filter to catch discharged ammonia and it is estimated that approximately 75 % of the ammonia emission in the stable can be caught in the filter and washed out as ammonium-sulphate and led into the slurry store. Thus, ammonia emission in this case would be calculated to be 5 % of excreted N. The slurry is stored in a well-covered tank. The ammonia losses are low from this storage system, 1 % of total nitrogen in the manure is estimated to be lost during the storing period.

Emissions of nitrous oxide

The manure is transported daily to the slurry tank, thus no losses of nitrous oxide in the stable are calculated. IPCC (1997, 2000) gives emission factors for losses of nitrous oxide during storing corresponding to 0.001 kg N₂O-N/kg N in slurry (after deduction for N emitted as ammonia). For estimations of indirect N₂O emissions due to deposit of ammonium, IPCC gives the EF of 0.01 kg N₂O-N/kg NH₄-N deposited. So far, there is very little data behind this emission factor and due to the great uncertainty, IPCC recommends this factor to be used rather than country-specific data (IPCC 2000).

Emissions of methane

The discharges of methane due to enteric fermentation are 1.5 kg CH₄/pig according to IPCC (1997). Due to differences in the intensity as well as choice of slaughter weight, the total life time of the slaughter pigs varies from 16.6 weeks/pig to about 23.7 weeks/pig and we use the higher figure for calculations (waste case always applies). The emission of methane from manure storage is calculated according to IPCC (1997):

Emission of CH₄ = VS * Bo * 0.67 kg/m³ * MCF

- VS stands for volatile solids excreted from animals. VS are 87 % of the dry matter in the manure (Dustan 2002). The average dry matter of the slurry is estimated to 8.8 % which has been recorded as an average for pig slurry.
- Bo is the methane generation potential, IPCC (1997) suggests 0.45 CH₄/kg VS for swine; this factor was also suggested by Naturvårdsverket (2002).
- MCF is the methane conversion factor. For slurry in hot climates, IPCC (1997) suggested MCF to be 20 %.

Given the proposed production scenario at Ncholo Covenant Farm it is evident that there are significant resources input into the system. Based on the first law of conservation of energy the

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various input conversion pathways were followed and potentially the following aspects emerged important for environmental management:

- Waste water
- Manure (major components being, N, P and K)
- Gaseous emissions
- Dead pigs carcasses

6.2. Pig Housing Design and Environmental Consideration

Key design aspects informed the risk assessment and included the following:

- Slated floor design to allow solid waste to drop off the floor
- Waste water collection, centrifugation and pumping to solid separation plant;
- Piping contained in concrete lined drain lines that collect waste in the event of leakages;
- Very low water table;
- Sandy loam soils;
- Distance from sensitive receptors of 1 km plus.

7. IMPACT ASSESSMENT

7.1 Impact Assessment Methodology

For each potential impact, the EXTENT (spatial scale), MAGNITUDE, DURATION (time scale), PROBABILITY of occurrence, IRREPLACEABLE loss of resources and the REVERSIBILITY of potential impacts must be assessed by the specialist by using the results of their specialist studies. The scales to be used to assess these variables and to define the rating categories are tabulated in Table 6.1.1 and Table 6.1.2 below:

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Table 6.1.1: Evaluation components, rankings scales and description (criteria).

Evaluation component	Ranking scale and description (criteria)
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	<p>5 - Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years. 1 - Immediate</p>
	5 - International: Beyond National boundaries.
EXTENT (or spatial scale/influence of impact)	<p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 - None</p>

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IRREPLACEABLE loss of resources	<p>5 – Definite loss of irreplaceable resources.</p> <p>4 – High potential for loss of irreplaceable resources.</p> <p>3 – Moderate potential for loss of irreplaceable resources.</p> <p>2 – Low potential for loss of irreplaceable resources.</p> <p>1 – Very low potential for loss of irreplaceable resources.</p> <p>0 - None</p>
REVERSIBILITY of impact	<p>5 – Impact cannot be reversed.</p> <p>4 – Low potential that impact might be reversed.</p> <p>3 – Moderate potential that impact might be reversed.</p> <p>2 – High potential that impact might be reversed.</p> <p>1 – Impact will be reversible.</p> <p>0 – No impact.</p>
PROBABILITY (of occurrence)	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>
Evaluation component	Ranking scale and description (criteria)
CUMULATIVE impacts	<p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p>

Table 6.1.2: Definition of significance ratings (positive and negative)

Significance Points	Environmental Significance	Description
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.

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75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

7.2. Impacts and Mitigation Measures

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided.

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Construction Phase

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. ACTIVITY: PERMITS AND AUTHORISATIONS				
1.1	<p>Aspects: Legislative compliance.</p> <p>Impact: Non-compliance with South African environmental legislation.</p> <p>Objective: Ensure compliance with all triggered environmental legislation.</p> <p>Target: Commence site establishment with all permission and approvals received and on hand.</p>	Developer	<p>Monitoring Action:</p> <p>Obtain copies of all permits; Record Keeping</p>	
	<p>Mitigation/Management Measures:</p> <p>a. The Developer is to have the following permits on commencement:</p> <ul style="list-style-type: none"> • Environmental Authorisation; • Environmental Management Program; and, • Building approval from the Municipality 		<p>Responsible Person/Party:</p> <p>Developer</p> <p>Monitoring Frequency:</p> <p>Once off</p>	
2. ACTIVITY: SITE LAYOUT PLANNING				

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2.1	<p>Aspects: Site Layout Plan.</p> <p>Impact: Negative impact on the environment of unmanaged and unplanned placement of Infrastructure.</p> <p>Objective: To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement.</p> <p>Target: All areas not demarcated for construction must remain vegetated and the impact must be minimised.</p>	Developer	<p>Monitoring Action:</p> <p>Record Keeping</p> <p>Responsible Person/Party:</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>Mitigation/Management Measures:</p> <ol style="list-style-type: none"> a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure, b. The planning for layout must be done in consultation with the ECO. c. The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; d. No servicing of vehicles may be permitted on site, unless for emergency purposes; e. Stockpiles must not be situated such that they obstruct pathways; and, f. Place infrastructure as far as possible on sites that have already been transformed; 		<p>Contract Project Manager / Engineer</p> <p>Monitoring Frequency: Once off</p>	

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3. **ACTIVITY:** CONSTRUCTION PROGRAMME / SCHEDULE

3.1	<p>Aspects: Project Management.</p> <p>Impact: Order and timing of construction activities and associated impacts.</p> <p>Objective: To Provide a clear indication of the order by which key construction activities will transpire.</p> <p>Target: Anticipate timing of impacts to coordinate the availability of any specialists and/or authorities who may be required to conduct site inspections.</p> <hr/> <p>Mitigation/Management Measures:</p> <p>a. Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed;</p>	<p>Contract Project Manager / Contractor</p>	<p>Monitoring Action:</p> <p>Meetings; Risk Register; ECO Audit Checklist; Photographs</p> <p>Responsible Person/Party:</p> <p>Contract Project Manager / Contractor / ECO</p>	
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<p>CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY</p>	<p>RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p>MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p>COMPLIAN T? (for use by ECO)</p>
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	<p>b. Communicate any deviation from this schedule with all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made;</p> <p>c. Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule;</p> <p>d. Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and,</p> <p>e. Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Bi-Weekly Audit Checklist.</p>		<p>Monitoring Frequency: Once off</p>	
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4. **ACTIVITY:** COMMUNICATION WITH LAND-OWNERS

4.1	<p>Aspects: Landowner Consent.</p> <p>Impact: Disturbance of existing land use.</p> <p>Objective: Maintain a conflict-free relationship with landowners / users.</p> <p>Target: No complaints received from landowners / users of affected property.</p>	Contract Project Manager / Contractor	<p>Monitoring Action: Meetings; Register. Risk</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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<p><u>Mitigation/Management Measures:</u></p> <p>a. Landowners are to be aware and in agreement of site access arrangements;</p> <p>b. The landowner has to be requested to liaise with the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes;</p> <p>c. All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and,</p> <p>d. Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the contractor. A public complaint register must be kept on site and the contract project manager must inform the Developer and/or ECO to take further action.</p>		<p><u>Responsible Person/Party:</u></p> <p>Contract Project Manager / Contractor / ECO</p> <p><u>Monitoring Frequency:</u></p> <p>Once off</p>	
<p>5. <u>ACTIVITY:</u> SITE ESTABLISHMENT</p>			
<p>5.1 <u>Aspects:</u> Demarcation of the site and vegetation removal.</p> <p><u>Impact:</u> Direct impact on vegetation during construction and loss of species.</p> <p><u>Objective:</u> Prevent unnecessary habitat destruction.</p> <p><u>Target:</u> All areas not demarcated for construction must remain vegetated.</p>	<p>Construction contractor</p>	<p><u>Monitoring Action:</u></p> <p>ECO to take photographs of site before clearance; ECO Audit Checklist.</p> <p><u>Responsible Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u></p>	
<p><u>Mitigation/Management Measures:</u></p> <p>a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object;</p> <p>b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed;</p> <p>c. Construction areas must be fenced;</p> <p>d. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area;</p>			

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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>e. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMP'r, if possible;</p> <p>f. There must be a preconstruction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to;</p> <p>g. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; and,</p> <p>h. No vegetation may be gathered for the purpose of creating fire;</p>			

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5.2	<p>Aspects: Topsoil stripping and conservation.</p> <p>Impact: Destruction of topsoil.</p> <p>Objective: Conserve and protect topsoil from erosion and destruction.</p> <p>Target: Topsoil condition maintained.</p> <hr/> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; b. Stockpile topsoil separately from subsoil, in heaps no higher than 2m; c. Topsoil stockpiles are to be kept free of weeds; d. Limit unnecessarily prolonged exposure of stripped areas and stockpiles; e. Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rains/ storm water; f. Topsoil need to be stored in designated areas only. This need to be planned and indicated on the site-layout plan; 	Construction contractor	<p>Monitoring Action: ECO Audit Checklist; Photographs;</p> <p>Responsible Person/Party: ECO</p> <p>Monitoring Frequency: Monthly</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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<p>g. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area;</p> <p>h. Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil;</p> <p>i. Ensure that topsoil is not mixed with subsoil and/or any other excavated material;</p> <p>j. Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan;</p> <p>k. Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality;</p> <p>l. Do not strip topsoil when it is wet; and,</p> <p>m. Do not mix topsoil obtained from different sites, unless the ECO gives permission.</p>			
6. <u>ACTIVITY:</u> SITE INFRASTRUCTURE PLACEMENT AND OPERATION			
<p>6.1 <u>Aspects:</u> Structures and lay-down areas. <u>Impact:</u> Deterioration of site features and surrounding areas. <u>Objective:</u> Prevent the deterioration of site features like soil, rainwater runoff and erosion. <u>Target:</u> The preservation of site conditions evident on establishment of structures and lay-down areas. <u>Mitigation/Management Measures:</u></p> <p>a. Locate all structures and storage areas, including offices, workshops and stores in approved locations are per the Site Layout Plan;</p>	<p>Construction contractor</p>	<p><u>Monitoring Action:</u> Photographs; ECO Audit Checklist</p> <p><u>Responsible Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u></p>	

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<p>b. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction;</p>			
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>c. Clearly define which activities are to occur within which areas of the site by erecting signage; and,</p> <p>d. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages.</p>		Monthly	

7. ACTIVITY: CONSTRUCTION SITE OPERATIONS

7.1	<p>Aspects: Security and fencing.</p> <p>Impact: Prevent danger to trespassing of persons.</p> <p>Objective: Keep the site secure from trespassing or theft and keep animals out.</p> <p>Target: Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.</p>		<p>Monitoring Action:</p> <p>Photographs; Audit Checklist</p>	
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<p><u>Mitigation/Management Measures:</u></p> <ol style="list-style-type: none"> a. Be responsive to open or closed status of gates; b. New or the upkeep of fences must be aligning to ensure safety of animals and maintain a reliable boundary area; c. Limit clearing of vegetation for fencing to the removal of trees and shrubs within 1 m of the fence line. All undergrowth must be maintained; d. Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion; and, e. In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties are informed of construction activity, schedules and vehicle movement. 	<p><u>Responsible</u> ECO</p> <p><u>Person/Party:</u> ECO</p> <p><u>Monitoring</u> <u>Frequency:</u> Monthly</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.2	<p><u>Aspects:</u> Existing Services and Infrastructure.</p> <p><u>Impact:</u> Damage to existing services and infrastructure.</p> <p><u>Objective:</u> No damages to existing services and infrastructure.</p> <p><u>Target:</u> No damages to existing services and infrastructure.</p>	Construction contractor	<p><u>Monitoring</u> Photographs; ECO</p> <p><u>Action:</u> Audit Checklist</p>	

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	<p><u>Mitigation/Management Measures:</u></p> <p>a. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities;</p> <p>b. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the project manager; and</p> <p>c. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the expense of the Contractor and shall receive top priority over all other activities.</p>		<p><u>Responsible Person/Party:</u> Contractor</p> <p><u>Monitoring Frequency:</u> Monthly</p>	
7.3	<p><u>Aspects:</u> Traffic.</p> <p><u>Impact:</u> Impact on traffic.</p> <p><u>Objective:</u> Minimise the disruption of road users.</p> <p><u>Target:</u> Minimal disruption of road users.</p> <p><u>Mitigation/Management Measures:</u></p> <p>a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits;</p> <p>b. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces;</p>	Construction contractor	<p><u>Monitoring Action:</u> Incident Register; Photographs; ECO Audit Checklist</p> <p><u>Responsible Person/Party:</u> Contractor</p> <p><u>Monitoring Frequency:</u></p>	

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	<p>c. Construction vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites;</p> <p>d. Abnormal loads must not be transported after dark;</p> <p>e. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods;</p> <p>f. Transport of materials must be limited to the least amount of trips possible; and</p> <p>g. Traffic deviations around the construction area must be planned in conjunction with the local authority to ensure safe and free flow of traffic. Safety signs must be utilised.</p>		Monthly	
7.4	<p>Aspects: Traffic.</p> <p>Impact: Traffic impacts associated with the movement of construction vehicles on site.</p> <p>Objective: To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p> <p>Target: Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.</p>	Construction contractor	Monitoring Action: Incident Register; Photographs; ECO	

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<p><u>Mitigation/Management Measures:</u></p> <p>a. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas;</p> <p>b. Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (storm water and erosion management plan required).</p> <p>c. Monitor the establishment of (alien) invasive species and remove as soon as detected, before regenerative material can be formed;</p>	<p>Audit Checklist</p> <p><u>Responsible Person/Party:</u></p> <p>Contractor</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)

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	<p>d. Abnormal loads and machinery must avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams;</p> <p>e. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so;</p> <p>f. Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; g. Signage is to be placed on vehicles at all times;</p> <p>h. All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil;</p> <p>i. After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and,</p> <p>j. Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.</p>			
7.5	<p>Aspects: Erosion Control.</p> <p>Impact: Loss of topsoil, formation of bare soil and deterioration of habitat quality.</p> <p>Objective: Prevent soil erosion.</p> <p>Target: No signs of soil erosion are evident on site.</p>	Construction contractor	<p>Monitoring Action:</p> <p>Incident Register;</p> <p>Photographs; ECO</p> <p>Audit Checklist</p>	

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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p><u>Mitigation/Management Measures:</u></p> <p>a. Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment on site;</p> <p>b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation;</p> <p>c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably immediately following construction; and,</p> <p>d. Maintain and reapply erosion control measures until vegetation is successfully established.</p>		<p><u>Responsible Person/Party:</u> Contractor</p> <p><u>Monitoring Frequency:</u> Monthly</p>	
7.6	<p><u>Aspects:</u> Handling of general – and hazardous waste materials on the construction site.</p> <p><u>Impact:</u> The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste.</p> <p><u>Objective:</u> Management and disposal of general – and hazardous waste in an appropriate manner.</p> <p><u>Target:</u> No record of pollution or site contamination by solid waste.</p>	Construction Contractor	<p><u>Monitoring Action:</u> ECO Audit Checklist</p> <p><u>Responsible Person/Party:</u></p>	

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<p><u>Mitigation/Management Measures:</u></p> <p>a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins; at least; must be present, one (1) for hazardous waste and one (1) for general waste at each working station. Dumping of waste on site is prohibited;</p> <p>b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately;</p> <p>c. Keep all work sites including storage areas, offices and workshops neat and tidy;</p>	<p>ECO</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)

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<p>d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste;</p> <p>e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site; as mentioned in the Basic Assessment Report;</p> <p>f. Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised;</p> <p>g. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste;</p> <p>h. Littering by construction workers shall not be permitted;</p> <p>i. Workers from the immediate area need to be encouraged to take their waste with them at the end of each day;</p> <p>j. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity;</p> <p>k. Minimise waste by sorting waste into recyclable and non-recyclable waste;</p> <p>l. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office;</p> <p>m. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Control Officer (ECO);</p> <p>n. Hazardous waste must be sorted general waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and,</p>			
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	<ul style="list-style-type: none">o. Do not dump waste of any nature, or any foreign material in the River or any drainage line.			
7.7	Aspects: Sewage waste.			

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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>Impact: Pollution and site contamination due to sewage.</p> <p>Objective: Provide facilities for appropriate collection and disposal of sewage.</p> <p>Target: No record of pollution or site contamination by sewage.</p>			<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance;</p> <p>ECO</p> <p>Audit Checklist</p>	
<p>Mitigation/Management Measures:</p> <p>a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and for each gender;</p> <p>b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating.</p> <p>c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene;</p> <p>d. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and,</p> <p>e. Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary implementation as part of the environmental awareness.</p>	Construction contractor	<p>Responsible Person/Party:</p> <p>ECO</p> <p>Monitoring Frequency:</p> <p>Monthly</p>		

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7.8	<p>Aspects: Dust Generation and visual Impact.</p> <p>Impact: Dust nuisance from site operations and visual impact of site operations on surrounding land owners.</p> <p>Objective: To avoid dust from excavated materials and construction activity and unnecessary visual impact caused by site operations.</p> <p>Target: Minimise the incidence of dust generation and visual impact.</p>	Construction contractor	<p>Monitoring Action:</p> <p>ECO to take photographs of site before clearance;</p> <p>ECO Audit Checklist</p>	<p>Responsible Person/Party:</p>
<p>Mitigation/Management Measures:</p> <p>a. Implement dust suppression measures by watering (or acceptable methods) areas to be cleared as well as already exposed surfaces with damaged soil particles, particularly during dry, windy periods;</p>				

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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<p>b. Ensure all vehicles remain on designated roads;</p> <p>c. Dust masks are to be supplied to workers;</p> <p>d. The transfer of soil or aggregate must be done over the shortest possible distance; i.e. Access roads are to be kept clean;</p> <p>f. Surface material that is scraped off during construction must be conserved and used for rehabilitation. Any spoil material must be disposed of in a manner that appears natural;</p> <p>g. Lay-down area(s) must be screened with shade cloth in an earth tone or other appropriate neutral colour;</p> <p>h. Site offices and structures must be limited to one location and carefully situated to reduce visual intrusion. Roofs must be grey and non-reflective;</p> <p>i. Lights within the construction camp must face directly downwards (angle of 90°);</p> <p>j. Avoid shiny materials in structures. Where possible shiny metal structures must be darkened or screened to prevent glare;</p> <p>k. Litter must be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and,</p> <p>l. The minimum amount of topsoil and vegetation must be removed during construction, must be conserved and used for final rehabilitation.</p>		<p>ECO</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	
<p>7.9 <u>Aspects:</u> Noise Generation.</p> <p><u>Impact:</u> Noise nuisance from site operations.</p> <p><u>Objective:</u> To avoid excessive noise generation from site operations.</p> <p><u>Target:</u> Minimise the incidence of noise generation.</p>	<p>Construction contractor</p>	<p><u>Monitoring Action:</u></p> <p>ECO to photograph take of site before clearance</p> <p>Audit Checklist</p>	

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<u>Mitigation/Management Measures:</u>			
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<p>a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time;</p> <p>b. Fit machinery with silencers;</p> <p>c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible;</p> <p>d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally;</p> <p>e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided;</p> <p>f. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods;</p> <p>g. Unless otherwise specified by the ESA, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays);</p> <p>h. No loud music is permitted on site or in the Camp;</p> <p>i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and,</p> <p>j. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users.</p>		<p><u>Responsible Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u> Monthly</p>	
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7.10	<p>Aspects: Fire Prevention.</p> <p>Impact: Uncontrollable fire.</p> <p>Objective: Prevent the outbreak of fires emanating from construction activity.</p> <p>Target: No incidences of fires are recorded for the site.</p>
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIAN T? (for use by ECO)

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<p><u>Mitigation/Management Measures:</u></p> <p>a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months;</p> <p>b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel;</p> <p>c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months;</p> <p>d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998;</p> <p>e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities;</p> <p>f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; e.g. No open fires are allowed anywhere on site;</p> <p>h. Storage of fuel or chemicals under trees is not permitted;</p> <p>i. Gas and liquid fuel is not to be stored in the same place;</p>	<p>Construction contractor</p>	<p><u>Monitoring Action:</u></p> <p>ECO to take photographs of site before clearance; ECO Audit Checklist.</p> <p><u>Responsible Person/Party:</u></p> <p>ECO</p> <p><u>Monitoring Frequency:</u></p> <p>Monthly</p>	
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	<p>j. Smoking may only occur within a 3m radius from designated areas;</p>			
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<ul style="list-style-type: none"> k. Personnel must be adequately trained in the handling of firefighting equipment; and, l. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area. 			
7.11	<p>Aspects: Local communities.</p> <p>Impact: Impact of construction workers on local communities, construction personnel and the local community.</p> <p>Objective: Construction workers must not alter existing social dynamics of local communities.</p> <p>Target: No incidences of conflict between.</p>	Construction contractor	<p>Monitoring Action: ECO Audit Checklist</p> <p>Responsible</p>	

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<p><u>Mitigation/Management Measures:</u></p> <p>a. Where possible, the Employer must make it a requirement for contractors to implement a ‘locals first’ policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks;</p> <p>b. The Employer must consider the establishment of a Monitoring Forum (MF) for the construction phase. The MF must be established before the construction phase commences and must include key stakeholders, including representatives from the local community, local councillors, farmers, and the contractor. The role of the MF would be to monitor the construction phase and the implementation of the recommended mitigation measures. The MF must also be briefed on the potential risks to the local community associated with construction workers;</p> <p>c. The Employer and the contractors must, in consultation with representatives from the MF, develop a Code of Conduct for the construction phase. The code must identify what types of behaviour and activities by construction workers are not permitted. Construction workers that breach the code of good conduct must be dismissed. All dismissals must comply with the South African labour legislation;</p>	<p><u>Person/Party:</u> ECO</p> <p><u>Monitoring Frequency:</u> Monthly</p>
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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	<p>d. The Employer and the contractor must implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase;</p> <p>e. The movement of construction workers on and off the site must be closely managed and monitored by the contractors. In this regard the contractors must be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis;</p> <p>f. The contractor must make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis during the 12-18-month construction phase. This would reduce the risk posed by nonlocal construction workers to local family structures and social networks;</p> <p>g. The contractor must make the necessary arrangements for ensuring that all non-local construction workers are transported back to their place of residence once the construction phase is completed. This would reduce the risk posed by non-local construction workers to local family structures and social networks; and,</p> <p>h. No construction workers, will be permitted to stay overnight on the site. Security personnel will be housed in the vicinity of the site.</p>			
7.12	<p>Aspects: Soil and water contamination due to construction activities such as the use of hazardous materials on site.</p> <p>Impact: Pollution of soil and water contamination by hazardous waste.</p> <p>Objective: Provide facilities for appropriate collection and disposal of hazardous waste.</p> <p>Target: No record of pollution or site contamination by hazardous waste.</p> <p>Mitigation/Management Measures:</p> <p>a. Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur);</p>	Construction contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor</p>	

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<p>CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY</p>	<p>RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p>COMPLIANT? (for use by ECO)</p>
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<p>b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces;</p> <p>c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used onsite, including information on their ecological impacts and how to minimise the impacts in case of leakage;</p> <p>d. All spillage must be cleaned up immediately after they have occurred;</p> <p>e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site;</p> <p>f. Vehicles and machinery must be regularly serviced to avoid leakages;</p> <p>g. No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA);</p> <p>h. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly;</p> <p>i. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited;</p> <p>j. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within;</p> <p>k. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur;</p>		<p><u>Monitoring Frequency:</u> Monthly</p>	
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DRAFT BASIC ASSESSMENT REPORT

	<p>i. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; m. Spill kits must be available at each working station;</p> <p>n. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and,</p>			
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DRAFT BASIC ASSESSMENT REPORT

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	o. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.			
7.13	<p>Aspects: Water Conservation.</p> <p>Impact: Wasting water as a result of negligence.</p> <p>Objective: Promote and implement water use efficiency mechanisms.</p> <p>Target: No Water Wastage.</p> <p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Re-use water were possible; b. Implement rain catchment strategies; c. Prevent leakages at taps and hoses by means of maintenance; d. Use buckets of water to clean tools instead of running water; e. Make sure that sediment, concrete, sand and rubbish does not end up going down the storm water drain. Cover or filter storm water inlets and drains; and, f. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high pressure hoses which are both water efficient and more effective cleaners. 	Construction contractor	<p>Monitoring Action:</p> <p>Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party:</p> <p>Contractor</p> <p>Monitoring Frequency:</p> <p>Monthly</p>	

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7.14	<p>Aspects: Health and Safety.</p> <p>Impact: Dangerous working conditions for workers.</p> <p>Objective: To prevent any casualties on site.</p> <p>Target: No Personnel casualties on site.</p>	Construction contractor	<p>Monitoring Action:</p> <p>Incident Register;</p>	
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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Ensure that PPE is available to Personnel; b. Adhere to the Occupational Health and Safety Act; c. Keep the first aid kit stocked; d. Issue all workers with necessary health and safety items; e. Potentially hazardous areas must be demarcated with danger tape; f. Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without authorisation; g. Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, 		<p>Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party: Contractor</p> <p>Monitoring Frequency: Monthly</p>	

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	<p>h. All construction personnel to wear hard hats and reflector jackets at all times.</p>			
7.15	<p>Aspects: Heritage Resources. Impact: Damage and destruction of vertebrate fossils during excavation activities. Objective: To prevent any destruction of valuable artefacts. Target: No destruction of any vertebrate fossils and artefacts.</p> <hr/> <p>Mitigation/Management Measures: a. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the</p>	Construction contractor	<p>Monitoring Action: Incident Register; Photographs; ECO Audit Checklist</p> <p>Responsible Person/Party: Contractor</p>	

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CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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<p>finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority;</p> <ul style="list-style-type: none"> b. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given; c. Excavations must be limited to the footprint area and be maintained in a narrow corridor; d. All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed: <ul style="list-style-type: none"> a. All construction in the immediate 50 m vicinity radius of the site must cease; b. The heritage practitioner must be informed as soon as possible; c. In the event of obvious human remains SAPS must be notified; d. Mitigation measures (such as refilling, etc.) must not be attempted; e. The area in a 50 m radius of the find must be cordoned off with hazard tape; e. Public access must be limited and the area must be placed under guard; f. The Furnace area must be protected and declared a no-go area until the developer appoints a suitably qualified archaeologist to conduct a Phase 2 archaeological assessment of the terrain and to draw up a heritage management plan for the site; and, g. The appointed archaeologist must apply for a valid permit from SAHRA to excavate the furnace for display and educational purposes. 		<p><u>Monitoring Frequency:</u> Monthly</p>	
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DRAFT BASIC ASSESSMENT REPORT

Operational Phase

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. ACTIVITY: OPERATIONAL PHASE IMPACTS				
1.1	<p>Aspects: Noise Generation.</p> <p>Impact: Noise nuisance from site operations.</p> <p>Objective: To avoid excessive noise generation from site operations.</p> <p>Target: Minimise the incidence of noise generation.</p>	Applicant	<p>Monitoring Action:</p> <p>Applicant to adhere to business hours.</p>	
	<p>Mitigation/Management Measures:</p> <ul style="list-style-type: none"> a. Machinery must be in sound mechanical condition and equipped with the necessary silencers; b. Workers on site must adhere to the prescribed working hours (7am – 6pm); c. Ensure that maintenance staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, d. No loud music will be permitted on site. 		<p>Responsible Person/Party:</p> <p>Applicant</p>	

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1.2	<p>Aspects: Handling of general – and hazardous waste materials on the construction site.</p> <p>Impact: The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste.</p> <p>Objective: Management and disposal of general – and hazardous waste in an appropriate manner.</p>	<p>Construction Contractor</p>	<p>Monitoring Action: Maintenance Contractor Checklist</p>
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OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>Target: No record of pollution or site contamination by solid waste.</p>			

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Mitigation/Management Measures:

- a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins; at least; must be present, one (1) for hazardous waste and one (1) for general waste at each working station. Dumping of waste on site is prohibited;
- b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately;
- c. Keep all work sites including storage areas, offices and workshops neat and tidy;
- d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste;
- e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site; as mentioned in the Basic Assessment Report;
- f. Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised;
- g. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste;
- h. Littering by construction workers shall not be permitted;
- i. Workers from the immediate area need to be encouraged to take their waste with them at the end of each day;
- j. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity;
- k. Minimise waste by sorting waste into recyclable and non-recyclable waste;

Responsible

Person/Party:

Monitoring Frequency:

Weekly

DRAFT BASIC ASSESSMENT REPORT

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>i. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office;</p> <p>m. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Control Officer (ECO);</p> <p>n. Hazardous waste must be sorted general waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and,</p> <p>o. Do not dump waste of any nature, or any foreign material in the Bath River or any drainage line.</p>			
1.3	<p>Aspects: Soil and water contamination due to construction activities such as the use of hazardous materials on site.</p> <p>Impact: Pollution of soil and water contamination by hazardous waste.</p> <p>Objective: Provide facilities for appropriate collection and disposal of hazardous waste.</p> <p>Target: No record of pollution or site contamination by hazardous waste.</p>	Construction contractor	Monitoring Action: Maintenance Contractor Checklist	

DRAFT BASIC ASSESSMENT REPORT

<p><u>Mitigation/Management Measures:</u></p> <ul style="list-style-type: none"> a. Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used onsite, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred; 	<p><u>Responsible Person/Party:</u></p> <p><u>Monitoring Frequency:</u></p> <p>Weekly</p>	
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<p>OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY</p>	<p>RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)</p>	<p><u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY</p>	<p>COMPLIANT? (for use by ECO)</p>
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| <ul style="list-style-type: none">e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site;f. Vehicles and machinery must be regularly serviced to avoid leakages;g. No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA);h. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly;i. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited;j. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within;k. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur;l. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; m. Spill kits must be available at each working station;n. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and,o. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file. | | | |
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DRAFT BASIC ASSESSMENT REPORT

1.4	<p>Aspects: Fire Prevention.</p> <p>Impact: Uncontrollable fire.</p>
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	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY</p> <p>Objective: Prevent the outbreak of fires emanating from construction activity.</p> <p>Target: No incidences of fires are recorded for the site.</p>			

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<p><u>Mitigation/Management Measures:</u></p> <p>a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months;</p> <p>b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel;</p> <p>c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months;</p> <p>d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998;</p> <p>e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities;</p> <p>f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; eg. No open fires are allowed anywhere on site;</p> <p>h. Storage of fuel or chemicals under trees is not permitted;</p>	<p>Construction contractor</p>	<p><u>Monitoring Action:</u> Maintenance Contractor Checklist</p> <p><u>Responsible Person/Party:</u></p> <p><u>Monitoring Frequency:</u> Weekly</p>	
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DRAFT BASIC ASSESSMENT REPORT

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<ul style="list-style-type: none"> i. Gas and liquid fuel is not to be stored in the same place; j. Smoking may only occur within a 3m radius from designated areas; k. Personnel must be adequately trained in the handling of firefighting equipment; and, l. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area. 			
1.5	<p>Aspects: Biological Aspects.</p> <p>Impact: Infestation of the area with Alien and Invasive Species.</p> <p>Objective: Monitor the occurrence of Alien and Invasive Species within the development area and implement Alien Invasive Species Management Plan</p> <p>Target: No Alien and Invasive Species within the development footprint.</p>			

DRAFT BASIC ASSESSMENT REPORT

<p>Clearing and Guiding Principles</p> <ul style="list-style-type: none"> <i>a.</i> Alien control programs are long-term management projects and must include a clearing plan which includes follow up actions for rehabilitation of the cleared area; <i>b.</i> The lighter infested areas must be cleared first to prevent seed build-up; <i>c.</i> Pre-existing dense areas must be left for last, as they probably will not increase in density or pose a greater threat than they are currently; and, <i>d.</i> All clearing actions must be monitored and documented to keep track of which are due for follow-up clearing. <p>Clearing Methods</p> <ul style="list-style-type: none"> <i>e.</i> Different species require different control methods such as manual, chemical or biological methods or a combination of the two; <i>f.</i> Care must be taken to ensure that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, soil disturbance must be kept to a minimum. The vegetative stage of the plants must be considered before clearing; 	<p><u>Monitoring Action:</u> Maintenance Contractor Checklist</p> <p><u>Responsible Person/Party:</u> ESA</p> <p><u>Monitoring Frequency:</u> Weekly</p>	
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OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
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- g. Fire is not a natural phenomenon in the area and must not be used in general for alien control or vegetation management at the site. Only *Cylindropuntia sp* must be destroyed by burning after removal, since these plants can spread vegetative as well as with seed; and,
- h. The best-practice clearing method for each species identified must be used. The preferred clearing methods for most alien species can be obtained from the Department of Water and Agricultural Affairs (DWAF) Working for Water website: <http://www.dwaf.gov.za/wfw/Control/>.

Use of Herbicides for Alien Control

Although it is usually preferable to use manual clearing methods where possible, such methods may create additional mechanical disturbance which may stimulate alien invasion and may also be ineffective for many woody species which resprout. Where herbicides are to be used, the impact of the eradication program on the natural environment must be minimised by observing the following:

- i. Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control;
- j. Care must be taken to prevent contamination of water bodies. This includes special care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures;
- k. Equipment must be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable place;
- l. To avoid damage to indigenous or other desirable vegetation, herbicides that would have the least effect on the indigenous vegetation must be used;
- m. Droplet nozzles with a coarse spray pattern must be fitted to avoid drift of herbicides onto neighbouring vegetation; and,
- n. The appropriate health and safety precautions must be followed regarding the storage, handling and disposal of herbicides.

DRAFT BASIC ASSESSMENT REPORT

1.6	<p>Aspects: Socio-Economic Aspects within the area.</p> <p>Impact: The creation of job opportunities during the operational phase.</p> <p>Objective: The operational phase will create a job opportunity for individuals residing in the area.</p> <p>Target: Job creation for individuals in the local area.</p>
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OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>a. Where reasonable and practical the contractors appointed by the applicant must appoint local contractors and implement a “local first” policy, especially for semi and low-skilled job categories. However; due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area;</p> <p>b. The recruitment selection process must seek to promote gender equality and the employment of women wherever possible, particularly for less labour-intensive work such as flag bearing and supervision; and,</p> <p>c. The ongoing presence of semi and high skilled personnel involved in the project construction phase will generate sustained clientele to a portion of the guest house industry within the vicinity of the development.</p>		<p>Monitoring Action: Maintenance Contractor Checklist</p> <p>Responsible Person/Party: ECO</p> <p>Monitoring Frequency: Weekly</p>	

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1.7	<p>Aspects: Socio-Economic Aspects within the area.</p> <p>Impact: Presence of maintenance workers in the area.</p> <p>Objective: Reduce the negative risk of family structures and social networks by maintenance personnel.</p> <p>Target: No negative risk by maintenance personnel to family structures and social networks.</p>		
	<p>a. Where possible, implement a requirement for contractors to implement a local employment policy for maintenance jobs, particularly for semi and low-skilled job categories, thus reducing impact which foreign workers could have on local communities;</p> <p>b. A contractual requirement of potential contractors must be a preparation and implementation of a Code of Conduct for maintenance workers, identifying types of behaviour and activities which maintenance workers may not engage in. Workers who breach this code must be dismissed, on the grounds that such dismissals comply with South African labour legislation;</p>		<p>Monitoring Action:</p> <p>Maintenance Contractor Checklist</p> <p>Responsible Person/Party:</p>

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	<u>MONITORING:</u> ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
<p>c. The project manager responsible for contractor appointments and administration, must implement an HIV/AIDS awareness programme for all contractors and their maintenance workers prior to commencement of maintenance activities;</p> <p>d. Contractors must manage the transport and movement of workers on and off site on a daily basis, as well as allow for the returning home of workers intermittently over weekends to limit interaction with local communities during such periods; and,</p>		<p>ESA</p> <p>Monitoring Frequency:</p> <p>Weekly</p>	

DRAFT BASIC ASSESSMENT REPORT

	<p>e. No personnel, with the exception of security officers, are permitted to stay overnight in the vicinity of the maintenance site and must be housed in a site camp.</p>			
1.8	<p>Aspects: Animal Waste</p> <p>Impact: Inadequate management of pig waste (e.g. accumulation of pig manure) can attract pests and may lead to the contamination the surrounding environment. Accumulation of manure and urine, dirty drinkers and feeders or lack of appropriate management may generate foul odours.</p> <p>Objective: Target: Establish an effective monitoring and cleaning procedure.</p>			
	<p>a. The supervisor must ensure that drinkers are checked for correct operation, desired flow rates achieved and malfunctions reported.</p> <p>b. The supervisor must ensure that contaminated food and other operational waste are appropriately and effectively contained and disposed of at the approved landfill site.</p>		<p>Monitoring Action: Maintenance Contractor Checklist</p> <p>Responsible Person/Party: Supervisor</p> <p>Monitoring Frequency: Weekly</p>	

DRAFT BASIC ASSESSMENT REPORT

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1.9	<p>Aspects: Ground and surface water Pollution</p> <p>Impact: Inappropriate routing of storm water will lead to stream sedimentation. Seepage of water from dirty pens. Inappropriate disposal of carcasses may pollute the surrounding environment.</p> <p>Objective: Target: Establish an effective monitoring and prevention systems.</p>			
	<ul style="list-style-type: none"> a. The DEA approved Flood attenuation and storm water management plans must be implemented. b. An Erosion Action Programme must be implemented to minimize erosion on the site. c. The supervisor must monitor and control sewage system. d. The drinking pens must be regularly maintained and in good working order to prevent overflows. e. The supervisor must ensure that carcasses are appropriately and effectively contained and disposed of at the approved landfill site. f. The supervisor must ensure that feeders are checked for cleanliness and freshness and contaminated pig food and pig excrement removed. g. The supervisor must ensure that drinkers are checked for correct operation, desired flow rates achieved and malfunctions reported. h. The supervisor must ensure that contaminated food and other operational waste are appropriately and effectively contained and disposed of at the approved landfill site. 		<p>Monitoring Action: Maintenance Contractor Checklist</p> <p>Responsible Person/Party: Supervisor/ECO</p> <p>Monitoring Frequency: Weekly</p>	

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1.9	<p>Aspects: Pest Control</p> <p>Impact: Inadequate implementation of pest control programmes.</p> <p>Objective: Target: Establish an effective Integrated Pest Management Strategy</p>			
OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF PIGGERY		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	<p>a. The supervisor must Implement Integrated Pest Management (IPM) strategies.</p> <p>b. The supervisor must ensure that pre-operation checks and services of pest control equipment are completed according to industry standards and relevant legislation.</p>		<p>Monitoring Action: Maintenance Contractor Checklist</p> <p>Responsible Person/Party: Supervisor/ECO</p> <p>Monitoring Frequency: Weekly</p>	

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7. REHABILITATION MEASURES

Removal of structures and infrastructure
<ul style="list-style-type: none">• On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment;• Clear and completely remove from site all construction structures and temporary infrastructure;• All permanent infrastructure must be returned to a useable state.
Inert waste and rubble
<ul style="list-style-type: none">• Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated.• Domestic waste must be completely removed from the site and disposed of at a landfill site.
Topsoil replacement and soil amelioration
<ul style="list-style-type: none">• The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure;• Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events;• The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has been completed;• All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads;• Topsoil must be returned to the same site from where it was stripped;
<p>When insufficient topsoil remains; soil of a similar quality can be obtained from a nearby area within the construction area which was disturbed;</p> <ul style="list-style-type: none">• Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.
Maintenance

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- All re-growth of invasive vegetative material will be monitored by the Developer for one year;
- All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cordoned off, to prevent vehicular, pedestrian and livestock access.
- Any re-vegetation must be done using plant species in occurrence on site;
- Control invasive plant species and weeds using approved methods of manual or chemical intervention;
- The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.

8. OPINION OF THE EAP

It is the opinion of the Imperatrix (Pty) Ltd that NO FATAL FLAWS are associated with the proposed Pig Farm within Portion 2 of Farm Brandbach 471 JR. All impacts can be adequately mitigated to reduce the risk or significance of impacts to an acceptable level.

It is also the opinion of IMPERATRIX (PTY) LTD that this Basic Assessment Report contains sufficient information to allow DEA to make an informed decision. IMPERATRIX (PTY) LTD therefore recommends that the application for Authorisation should be approved on condition that the recommended mitigation measures stated herein are effectively implemented.

9. DECLARATION

I, **Ronewa Tshibubudze**, declare that in my professional opinion –

- The specialist responsible for this floristic study and compilation of this report performed his duties to the best of his intellectual ability and knowledgeable experience;
- The information contained in this report is validated and reflects true to the situational analysis conducted on site;
- The report suffices for inclusion in an environmental impact assessment report supporting an application process for environmental authorisation.

IMPERATRIX (PTY) LTD

Name of company



February 2020

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