ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE JAN SMUTS ROOIHOOGTE PIGGERY EXPANSION, RIEBEECK KASTEEL

26 APRIL 2018

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	Title: **JAN SMUTS ROOIHOOGTE PIGGERY EXPANSION, RIEBEECK KASTEEL** **FARM 649 PORTION 4 GROOTVERLANGEN, MALMESBURY** **1st DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME**
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DEFINITIONS

Auditing:	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis based to a (e.g. ISO 19011:2003) standard.
Biodiversity:	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Contractor:	An employer, as defined in section 1 of the Occupational Health and Safety Act 85 of 1993, who performs construction work and includes principal contractors.
Environment:	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Evaporation:	The change by which any substance (e.g. water) is converted from a liquid state into and carried off as vapour.
Developer:	One who builds on land or alters the use of an existing building for some new purpose.
Independent:	Is independent and has no interest in any business related to the development site, nor will receive any payment or benefit other than fair remuneration for the task undertaken.
Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlaying soil, are saturated under pressure equal to or greater than atmospheric.
Landowner:	Holder of the estate in land with considerable rights of ownership or, simply put, an owner of land.
Monitoring:	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Natural vegetation:	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution:	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants:	Plant species officially listed under the Threatened or Protected Species regulations as well as on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.
Red Data Species:	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.
Rehabilitation:	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.
Site:	Property(s) or area where the proposed development will take place.

ACRONYMS

DEA&DP:	Department of Environmental Affairs and Development Planning
DWS:	Department of Water and Sanitation
ECO:	Environmental Control Officer
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EO:	Environmental Officer
ER:	Engineer's Representative
I&AP:	Interested and Affected Party
IEM:	Integrated Environmental Management
PM:	Project Manager
SANS:	South African National Standards

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DEVELOPER'S COMMITMENT

The piggery has committed itself to a set of values that include the maintenance of good relations and transparent communications with all stakeholders, and the dynamic engagement of the larger community.

The piggery undertakes to implement suitable management systems for all the areas and aspects of this operation. This will ensure that development itself and management of the project will comply with legal, technical, environmental and transformation policies and standards.

The piggery, in drafting this EMP for implementation, intends to enable continuous improvement in legal compliance and the sustainable operation of the site.

The EMP intends to change the way in which the owners, the construction process they have commissioned and the contractor plan for and manage resources to achieve sustainability.

The satisfactory implementation of the EMP on site will require both the full support and commitment of all personnel.

CHAPTER 1

1.1. Executive Summary

This EMP has been prepared principally in compliance with the requirements of section 24N and Section 34 of the National Environmental Management Act 107 of 1998. This document, together with the conditions in the Environmental Authorisation, and the conditions in the Waste Management Licence, must be adhered to.

The EMP must be included as part of all contract documentation for all contractors in the construction and operational phases of the development.

The Author and Eco Impact Legal Consulting (Pty) Ltd ("Eco Impact")

Lauren Abrahams has completed her professional registration in terms of section 20(3) (b) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) as a Candidate Natural Scientist in the field of practice Biological Science (Registration number 100126/12). She obtained her B Tech in Oceanography at the Cape Peninsula University of Technology in 2010.

Lauren has trained as an Environmental Assessment Practitioner since July 2015 and has been involved in the compilation, coordination and management of Basic Assessment Reports, Environmental Impact Assessments, Environmental Management Programmes, Waste Licence Applications, Water Use Licence Applications and Baseline Biodiversity Surveys for numerous clients.

The piggery has appointed Eco Impact to prepare an Environmental Management Programme that meets the technical standards as required by DEA&DP.

1.2. Project Description

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

The expansion of the existing 1000 sow piggery to increase the piggery with another 1000 sows to 2000 sows by expanding the existing breeding site with 6 piggery houses on approximately 2.8ha, the weaning site with two piggery houses on approximately 0.5ha and the growing site with 8 piggery houses on approximately 4.85 ha. All dead pigs and animal waste generated will be treated at the onsite 1.4ha compost facility and sludge collection dam of approximately 1.3ha.

The biodegradable industrial wastewater (pig manure, urine and wash water) from the facilities will be collected in sumps from where it will be collected with a honey sucker tanker and sprayed onto the agricultural lands (400ha available) as organic fertiliser at the weaner and breeder sites. The biodegradable industrial wastewater at the grower site will be collected in a sump. From the sump the solids will be screened out and the liquid will be pump to an onsite collection pond lined from where it will be reused via irrigation in in accordance with the recommendations for the application of

wastewater to agricultural land presented in the prescribed Water Research Commission Guidelines (as detailed under subsection 1.10 of the schedule).

Growing site housing units infrastructure:
Seven piggery houses of 121.5m x 9m with = 1094m^2 and one unit of 58.5m x 9m = 527m^2.

Weaner site housing units infrastructure:
Four piggery houses of 49.5m x 8.5m with = 396m^2.

Breeding site housing units infrastructure:
One piggery house of 80m x 7m with = 440m^2, and
One unit of 80m x 14m = 1120m^2, and
One unit of 175m x 14m = 2450m^2, and
Four units of 80m x 14m = 1120 (4480m^2).
Pond of 50 m x 50 m x 4m deep (10 000m^3)

The property is situated approximately 5km north east of the town Riebeeck Kasteel west of the berg River.

Please refer to the SDP located in Annexure 1 of this document.

Location alternatives
The property was the only alternative considered. Existing access, the existing piggery operational requirements and infrastructure were all considered when the location of the expansion facilities was taken in consideration on the property. No other location, site or property alternatives were considered as they are not feasible or reasonable due to the fact that the proposed activity is for the expansion of the existing piggery.

Activity alternatives
The activity was the only alternative considered. No other activity alternatives were considered as they are not feasible or reasonable due to the fact that the proposed activity is for the expansion of the existing piggery.

Layout alternatives
Only one design and layout alternative was considered. The existing piggery and the assurance scheme for piggeries in South Africa (Pork 360) provide guidelines for the design of the piggery facilities. The existing piggery infrastructure and its operations restricted the area to where the expanded infrastructure can be developed. No feasible or reasonable layout or design alternative exist as the existing sites development footprint and infrastructure, together with the Pork 360 assurance scheme requirements were used to design the piggery infrastructure proposed for this expansion application. South Africa was challenged with outbreaks of two exotic diseases between 2004 and 2007; namely Classical Swine Fever (CSF) and Porcine Reproductive and Respiratory Disease (PRRS). Eradication of these diseases, especially CSF, cost the government and the South African Pork Producers' Organisation (SAPPO), millions of Rands in compensation to farmers for the culling of thousands of pigs. However, the message is clear: **pig farmers must adhere to minimum biosecurity to prevent diseases entering their farms as it is unlikely that compensation will be paid in future**. SAPPO and pig veterinarians have put much effort into an educational drive to ensure that all piggeries comply with a number of minimum biosecurity measures. SAPPO encouraged SA Veterinary Services to introduce a compartmentalisation system, which is aimed at taking biosecurity to the next level and offering countries importing SA pork & pigs assurance that these products are safe to import. Producers participating in this voluntary scheme are audited by State Veterinarians and have to comply with strict biosecurity measures. The system is already bearing fruit. With the outbreak of foot and mouth disease early in 2011, **the export of all livestock and livestock products were prohibited**. This not only affected the pockets of local livestock producers, but neighbouring countries in southern Africa also suffered, as many of them rely heavily on South Africa as part of their food basket. After negotiations with the government, pork producers participating in SAPPO's compartmentalisation system were allowed to resume exports of pork, clearly demonstrating the benefits of the compartments. The system aims to keep these highly infectious diseases from South African pig herds and is conducted in cooperation with the national animal health authorities. The compartments present a disease-control mechanism and will ensure that in the event of an exotic-disease outbreak in the country the risk of the disease spreading among South African

herds is limited. The national veterinary authorities will then also be able to certify the compartments as disease free. This may ensure the continuation of exports[1].

Technology alternatives

No technological alternatives other than duel flush toilet systems and energy efficient lighting and geysers are considered at the facilities. Furthermore, the facility will use technology approved by Pork 360 assurance scheme. Pork 360 certification ensures that producers meet the increasing demand for food safety by retailers and consumers. A further result is that producers save in feed and medicine usage as the intensive monitoring of their production systems ensures that wastage is avoided and those opportunities for improvement in their production systems are continuously being identified. The expansion planned will include screen to screen out solids at the Grower units and to construct a pond to collect effluent during winter months for disposal as organic fertiliser during summer months on the 400ha available on the farm.

Operational alternatives

The handling and use of the pig manure and urine as organic fertiliser is the only other operational alternatives consider. The expansion planned will include screen to screen out solids at the Grower units and to construct a pond to collect effluent during winter months for disposal as organic fertiliser during summer months on the 400ha available on the farm. The proposed development is an expansion of a piggery and the current operations as for the rest of the facility will continue as is.

The No-Go Option

The No-Go option will result in the site remaining as is presently and the existing piggery will continue as is without the expanded infrastructure. However, the No-Go Option is nevertheless considered and assessed in relation to the potential implications of the proposed project, as required in terms of NEMA and its EIA Regulations.

Impact Summary

The assessment of these impacts before and after recommended mitigation is summarised in the table below. After mitigation, none of the impacts are assessed as being above LOW significance.

Construction phase:

- Disturbance to subsurface geological layers (low impact before mitigation and low impact with mitigation measures);
- Soil erosion and dust - (Low impact before mitigation and low impact with mitigation measures);
- Impact of construction activities on surface and underground water pollution - (High impact before mitigation and low impact with mitigation measures);
- Impact on Drainage Line / Groundwater resources - (High impact before mitigation and low impact with mitigation measures);
- Impact on surrounding and municipal planning policies and guidelines - (low impact before mitigation and low impact with mitigation measures);
- Impact on the indigenous terrestrial flora and habitat present in the area. Impact on the naturally occurring fauna present in the area - (Low impact before mitigation and low impact with mitigation measures);
- Increased jobs - (No impact before mitigation and positive impact with mitigation measures);
- Increased traffic due to the construction activities requiring various vehicles to come onto and leave the site - (Low impact before mitigation and low impact with mitigation measures);
- The potential impact of the proposed development on archaeological, paleontological and heritage remains - (Low impact before mitigation and low impact with mitigation measures);

Operational phase:

- Disposal of biodegradable wastewater - (High impact before mitigation and low impact with mitigation measures);
- Soil erosion and dust - (low impact before mitigation and low impact with mitigation measures);
- Impact of operation activities on surface and underground water pollution - (High impact before mitigation and low impact with mitigation measures);
- Impact on Drainage Line / Groundwater resources - (High impact before mitigation and low impact with mitigation measures);

[1] http://www.pork360.co.za/bio-security/

- Impact on surrounding land use and its potential effect on surrounding environment - (low impact before mitigation and low impact with mitigation measures);
- Impact on the indigenous terrestrial flora and habitat present in the area. Impact on the naturally occurring fauna present in the area - (Low impact before mitigation and low impact with mitigation measures);
- Increased jobs - (No impact before mitigation and positive impact with mitigation measures);
- Increased traffic due to the operation activities requiring various vehicles to come onto and leave the site - (Low impact before mitigation and low impact with mitigation measures);
- The potential impact of the proposed maintenance activities on archaeological, paleontological and heritage remains - (Low impact before mitigation and low impact with mitigation measures)

Decommissioning phase:
Similar to impacts associated with construction phase.

Please see **Annexure 1** of this report for the Site Development Plans and Biodiversity overlay map.

CHAPTER 2

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

It deals with issues relating to the implementation of the EMP.

2.1 Organizational Structure

The organizational structure identifies and defines the responsibilities and authority of the various persons and organizations involved in the project. All instructions and official communications regarding environmental matters must follow the organizational structure.

The Environmental Official (EO), to whom the Engineer's Representative (ER) and/or Environmental Control Officer (ECO) must report and interact, must be the responsible client representative.

The EMP must be an agenda item at the monthly site and operations meetings and the responsible client representative(s) may attend these meetings in order to provide input with respect to compliance with the EMP.

2.2 Responsibilities and Functions of the Environmental Control Officer

The ECO will be responsible for monitoring, reviewing and verifying compliance with the EMP and/or EA by all contractors and site management during site visits.

The ECO duties in this regard will include the following:

With the assistance, where necessary of the ER, to ensure all necessary environmental authorizations and permits have been obtained and are available and visible on site at the ER offices.

- monitor and verify that the EMP and/or EA is adhered to at all times and by taking action if the specifications are not followed;
- monitor and verify that environmental impacts are kept to a minimum;
- review and approve construction method statements, with input as appropriate from the ER;
- assist the contractor in finding environmentally responsible solutions to problems;
- report on the environmental issues at the site meetings and other meetings that may be called regarding environmental matters, if requested by ER;
- inspect the site and surrounding areas regularly with regard to compliance with the EMP and/or EA;
- monitor the environmental awareness training for all personnel coming onto site;
- advise management on the removal of person(s) and/or equipment not complying with the specifications, after collaboration with the ER. Recommendations must be recorded by the ER in a Site Instruction Book;
- ensure that activities on site comply with known legislation of relevance to the environment;
- recommend the issuing of penalties via the developer for contraventions of the EMP and/or EA;

- keep a photographic record of progress on site from an environmental perspective; and
- undertake a continual internal review of the EMP and/or EA and submit a report to the developer and the responsible DEA&DP Environmental Official according to EA conditions.

2.3 Agreed Work Plan and Site Visit Schedule of ECO

After initial construction start-up site visit it is recommended that an ECO site visit be conducted once a month during construction.

Information recording activity on site, and any guidelines or instructions emanating from there will be routinely made available electronically to the developer and applicable contractors and a copy of the report must be available at the site office.

Clearly matters of urgency or immediate action may be channelled appropriately on an urgent basis.

2.4 Site Manager

The site manager will have the following environmental control responsibilities:

- In conjunction with the ECO will present the environmental education programs to all persons employed on site.
- Consult with the ECO, landowner, developer and any contractor to resolve all environmental issues.
- Issue any instructions from the ECO to the management team via a formal site instruction book or appropriate management tool used for the purpose.
- Take responsibility for the penalty system. The ECO and developer recommendations must be considered when deciding whether or not to impose a penalty.
- The engineer will, via the ECO actions, be accountable for the overall implementation of the Environmental Management Programme.
- Keep a site diary and complaints register.

2.5 Contractors

As part of any tender, the tendering contractor must submit a first draft of a contractor's programme, to the developer which must include the environmental considerations to be followed prior to appointment.

The appointed Contractor's representative will have the following responsibilities:

- Ensure that all staff is familiar with the Environmental Management Programme, which explains the environmental policy for the project.
- Allow for sufficient time between surveying the exact locations where services will be intended and actual construction, for the ECO to facilitate and instruct for the removal of plants, seeds and cuttings if necessary.
- The contractor must keep his personnel fully aware of environmental issues and ensure they show adequate consideration to all environmental aspects.
- Establish environmental signs to be erected on the construction site at locations identified by the ECO and approved by the engineer.
- Be responsible for the cost of the restoration of any damage caused, in environmentally sensitive areas, as a result of contractor responsibility regarding negligence. This must be done in accordance with the engineer / ECO's specifications.
- Take responsibility and active steps to avoid any increase in the fire hazard.
- The contractor must take responsibility for implementing all the relevant provisions of the EMP, or if he encounters difficulties with the specifications, he must discuss alternative approaches with the ECO and engineer prior to proceeding.

Failure to comply with the EMP may result in the application of fines as set out, and any reported non-compliance may result in the suspension of work or termination of a contract.

2.6 Record keeping of activities, inclusive of recording of non-compliances and corrective actions

The site must keep a record of all activities relating to environmental matters on site, including:

- meetings attended;
- method statements received and approved;
- issues arising on site;
- cases of non-compliance with the EMP;
- corrective actions taken and penalties issued.

This information will be recorded in an appropriate manner in a site diary, registers, issues/warning book, etc.

2.7 Compliance with other legislation

It is important that all on site staff are aware of other relevant legislation that may relate to the activities taking place on site, especially local authority required compliances.

CHAPTER 3

Applicable Legislation, Policy and Environmental Principles

3.1 Applicable Legislation Identified

1. ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 OF 1940
2. BASIC CONDITIONS OF EMPLOYMENT ACT, 75 OF 1997
3. COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT, 130 OF 1993
4. CONSERVATION OF AGRICULTURAL RESOURCES ACT, 43 OF 1983
5. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996
6. EMPLOYMENT EQUITY ACT, 55 OF 1998
7. ENVIRONMENT CONSERVATION ACT, 73 OF 1989
8. ENVIRONMENT CONSERVATION ACT, 73 OF 1989, WESTERN CAPE NOISE CONTROL REGULATIONS
9. FENCING ACT, 31 OF 1963
10. HAZARDOUS SUBSTANCES ACT, 15 OF 1973
11. LABOUR RELATIONS ACT, 66 OF 1995
12. NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 103 OF 1977
13. NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998
14. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 39 OF 2004
15. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 10 OF 2004
16. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 59 OF 2008
17. NATIONAL FORESTS ACT, 84 OF 1998
18. NATIONAL HEALTH ACT 61 OF 2003
19. NATIONAL HEALTH ACT 61 OF 2003 REGULATIONS RELATING TO THE MANAGEMENT OF HUMAN REMAINS
20. NATIONAL HERITAGE RESOURCES ACT, 25 OF 1999
21. NATIONAL VELD AND FOREST FIRE ACT, 101 OF 1998
22. NATIONAL WATER ACT, 36 OF 1998
23. OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993
24. SWARTLAND LOCAL MUNICIPALITY: AIR QUALITY BY-LAW
25. SWARTLAND LOCAL MUNICIPALITY: BY-LAW ON DISPLAY OF POSTERS AND BANNERS
26. SWARTLAND LOCAL MUNICIPALITY: BY-LAW RELATING TO BOUNDARY WALLS AND FENCES
27. SWARTLAND LOCAL MUNICIPALITY: BY-LAW RELATING TO PUBLIC NUISANCES
28. SWARTLAND LOCAL MUNICIPALITY: BY-LAW RELATING TO ROADS AND STREETS
29. SWARTLAND LOCAL MUNICIPALITY: FIRE SAFETY BY-LAW
30. SWARTLAND LOCAL MUNICIPALITY: MUNICIPAL LAND USE PLANNING BY-LAW
31. SWARTLAND LOCAL MUNICIPALITY: OUTDOOR ADVERTISING AND SIGNAGE BY-LAW
32. SWARTLAND LOCAL MUNICIPALITY: STORM WATER MANAGEMENT BY-LAWS
33. SWARTLAND LOCAL MUNICIPALITY: WASTE MANAGEMENT BY-LAW
34. SWARTLAND LOCAL MUNICIPALITY: WATER SERVICES BY-LAW
35. TOBACCO PRODUCTS CONTROL ACT, 83 OF 1993
36. WEST COAST DISTRICT MUNICIPALITY: AIR QUALITY MANAGEMENT BY-LAW
37. WEST COAST DISTRICT MUNICIPALITY: BY-LAW RELATING TO FIRE SAFETY

38. WEST COAST DISTRICT MUNICIPALITY: MUNICIPAL HEALTH BY-LAWS

CHAPTER 4

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

COMPLIANCE

4.1 Monitoring and Auditing

4.1.1 Introduction

In keeping with current environmental and associated legislation, all environmental management procedures and actions must be reviewed and refined on an ongoing basis.

This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light.

The process of review and refinement, built into the requirements of the EMP, is known as monitoring and auditing.

4.1.2. Roles and responsibilities

Efficient implementation of the performance specifications, effective monitoring and auditing, as well as clear responsibility and accountability allocation requires that various role-players be defined for the construction implementation project.

Depending on the nature and scale of a project, implementing teams could be composed of any number of role-players, each with their own specified responsibilities.

Therefore, for the purpose of this document, the following role-players are defined, based purely on responsibility and accountability allocation. The actual designation of role-players may vary, but the responsibilities will largely remain as stated.

4.1.2.1. Developer/landowner or custodian of the land

The developer/landowner or custodian of the land is the person or organization with decision making capacity for the land in question, and thus ultimately accountable for what takes place on that land.

4.1.2.2. Contractor

Contractors are appointed to undertake the works as specified in the contract. It is the responsibility of the contractor to do whatever is necessary from their side to ensure that he or an appointed advisor is well versed in environmental studies, so that they may accurately and efficiently carry out the requirements of the environmental specification.

The contractor is liable for any and all remedial work required in terms of the environmental specification, resulting from his environmental negligence, mismanagement and / or non-compliance.

4.1.2.3. Environmental Control Officer

An environmental control officer will manage and undertake monthly environmental inspections for the duration of the construction phase of the project as required.

The contractors or line management are answerable to the ECO for non-compliance. Issues of non-compliance raised by the ECO/EO must be taken up by the project manager, and resolved as per the conditions of his contract.

Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation and not allowed for in the performance specification) must be endorsed by the project manager.

4.2 The Monitoring Procedure

Environmental monitoring is the continuous evaluation of the status and condition of environmental elements. Its purpose is to detect change that takes place in the environment over time and involves the measuring and recording of physical, social and economic variables associated with development impacts.

Many techniques for environmental monitoring have been proposed, each detailing a specific protocol. Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- to state compliance,
- partial compliance and
- non-compliance

Completed monitoring reports will be submitted to the project engineer, developer/landowner and the contractor, who will attend to issues. These reports must be kept on file and be made available upon request by any environmental authority requesting such.

All persons employed, the contractor or his sub-contractors, must abide by the requirements of these performance specifications as they apply to the works. Any employees, the contractor or his sub-contractors found to be in breach of any of the environmental specifications, may be ordered to vacate the site forthwith and/or be subject to a disciplinary process.

The order may be given orally or in writing by the ECO. Confirmation of an oral order will be given as soon as practicable, but lack of confirmation in writing must not be a cause for the offender to remain on site, or not be subject to a disciplinary process. Supervisory staff, the contractor or his sub-contractor may not direct any person to undertake any activities which would place such person in contravention of the EMP, legislation and specifications.

The contractor and staff are deemed not to have complied with the performance specifications if:

- There is evidence of wilful or accidental contravention of any specification included in the specification;
- There is evidence of the contractor carrying out activities not permitted in terms of the EMP, contract and / or the specification;
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment;
- Has failed to meet with the requirements of the approved schedule.

The contractor and developer/landowner will be informed via ECO monthly reports, as well as by means of direct instruction (if necessary) as to what corrective actions are required in terms of environmental compliance.

Disregard for an instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance. Non-compliance may lead to parties being penalised.

In more serious cases, the ECO may give notice, and halt operations until such a time that the corrective action is taken and the site complies with the performance specifications.

In cases of persistent non-compliance, the contractor or staff may be evicted from site after disciplinary process is followed. Only the developer/landowner may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

4.3 The Auditing Procedure

Environmental auditing is the process of comparing the impacts predicted with those which have actually occurred during implementation.

An environmental performance audit examines and assesses practices and procedures which, in the event of failure, would cause an environmental impact or result in an environmental risk. During each

of the lifecycle phases, various issues will be monitored. The performance audit will ensure that the monitoring was correctly undertaken and that compliance was best achieved.

To these ends the project will be audited versus this EMP for effectiveness. ISO/SANS 19011:2011 auditing standards will be applied.

Audits will be undertaken at completion of the construction phases. Audit reports will be submitted to management, who will attend to all noted issues.

Construction activities must be audited by the ECO on a monthly basis against the relevant conditions of the Waste Management Licence with a summary thereof (i.e. indicating the partial and non-compliance and relevant mitigation measures) submitted to the Department on a monthly basis.

These reports must be kept on record and be made available upon request by the developer/landowner/custodian of the land and any environmental authority or I&AP requesting such.

4.4 Retentions and Penalties

It is recommended that a penalty retention system be combined with the penalty system to both motivate and compel the contractor to adhere to the EMP for the duration of the contract.

In this way incentives may be created to perform (i.e. in the form of the retention amounts that will only be paid to the contractor at the end of the contract), without creating the misunderstanding that adherence to the EMP is optional.

Persistent non-compliance will not only result in the contractor forfeiting any retention amount, but he will also be fined.

Of importance is that the contract specifies exactly how the penalty and retention system will operate, as well as how any funds resultant from retentions and penalties will be utilised.

All such funds must be used to improve environmental conditions on the site in general.

4.4.1. The Retention System

For this system, a percentage value for each of the sections priced for in the environmental bill of quantities is retained until the full completion of the contract works.

If the monitoring process reveals persistent and/or wilful non-compliance with any aspect of the environmental performance specifications, then the full retention associated with that particular item will be withheld.

The project may then apply these retained funds to rectify the problem on site possibly making use of other or alternate resources at his disposal.

At the end of the contract or action, all remaining environmental retention amounts will be paid out to the contractor or staff pending approval by the ECO, after having confirmed full compliance with the relevant performance and rehabilitation specifications.

4.4.2. Penalty System

A system of penalties will be introduced to reinforce environmentally sensitive and prudent behaviour. The maximum penalties that will be fined per incident that may be enforced are listed below. The penalty amount will be determined (inter alia) by the severity of the offence.

Non-compliance	R 5 000.00 (ex VAT) per non-compliant act, per day until compliance is achieved
Casual Litter on site resulting from operation	R250 / offence / day
Disposal of any litter or construction material in non-specified area or by non-compliant means	R5000 / m^3 / per day

Dumping of cement, concrete, fuel or oil in an area or other than that authorised and suitable	R10 000 per offence / day
Failure to use portable / toilets	R100 / observed incident or evidence of human excrement on site

In addition to the above, all costs incurred by the client / developer to remedy any damage will be the responsibility of the offender.

Should the monitoring process reveal acts of persistent and / or wilful non-compliance with the environmental performance specifications, then the contractor or staff member will be fined according to the specified value of that item.

4.5 Method Statements

Contractors must provide written statements for discussion with the ECO on environmentally sensitive aspects of the contract. Environmentally sensitive aspects include by example excavations, work close to sensitive areas, collection and storage of top soil and vegetation, erosion control, wash water control, waste control, etc.

CHAPTER 5

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act 107 of 1998.

5.1. Good Housekeeping

The developer/landowner will ensure the maintenance of “good housekeeping” practices during operations.

This will help avoid several disputes regarding responsibility and will allow for the smooth running of the operation as a whole.

Good housekeeping extends beyond the environmentally sensitive construction methods to include the care for and preservation of the surrounding environment.

5.2 Record Keeping

The developer/landowner will ensure that a filing system, identifying all documentation related to the EMP, is established.

A list of reports likely to be generated during the project is set out below.

All applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Approved EMP, authorizations, licenses or permits;
- Final design documents and diagrams issued;
- All communications detailing changes of design/scope that may have environmental implications;
- Daily, weekly and monthly site monitoring reports;
- Complaints register;
- Environmental training manual;
- Environmental training attendance registers;
- Incident and accident reports;
- Emergency preparedness and response plans;
- Copies of all relevant environmental legislation;
- Permits and legal documents as part of emergency preparedness teams e.g. fire teams, etc.;
- Material data sheets of all chemicals utilised on site;
- Crisis communication manual;
- Disciplinary procedures;
- Monthly site meeting minutes during construction;
- All relevant permits;

- All method statements for all phases of the project;
- All Standard Operating Procedures developed for implementation during all phases of the project.

All registers and records should be kept on site and must be made available to the department on request.

5.3 Document Control

The developer/landowner will be responsible for establishing a procedure for document control.

The document control procedure must comply with the following requirements:

Documents must be identifiable by organisation, division, function, activity and contact person;
Every document must identify the person and their positions, responsible for drafting and compiling the document, for reviewing and recommending approval, and final approval of the document for distribution;

All documents must be dated, provided with a version number and reference number, filed systematically, and retained for a specified period.

The owner will ensure that documents are periodically reviewed and revised where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMP are performed. All documents will be made available to the external auditor.

5.4 Reporting Requirements

All advice and recommendations made by the ECO must with the project engineer/engineers compliance be recorded on site in the site instruction book/ suitable register for his attention.

All spills will need to be documented and reported to DWS and other relevant authorities.

CHAPTER 6

6.1. Public Communication Protocols

This section of the report is included in compliance with Section 24N (2) (e) of the National Environmental Management Act, 107 of 1998.

The developer/landowner must be responsible for regulating public access to information and compliance reporting.

The developer/landowner must respond to third party or public queries and complaints.

The developer/landowner must also be responsible for maintaining the compliance register to record complaints received and action taken. All complaints received by the facility must be documented.

CHAPTER 7

This section of the report is included in compliance with Section 24 N 2 (d - g) and 3 (a - b) of the National Environmental Management Act, 107 of 1998.

Goal for Planning and Design (PD)

Overall Goal for Planning and Design: Undertake the planning and design phase of the facility in a way that:

- Ensures that the design of the facility responds to the identified environmental constraints and opportunities.
- Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- Ensures that adequate regard has been taken of any landowner concerns and that these are appropriately addressed through design and planning (where appropriate).
- Ensures that the best environmental options are selected for the project.
- In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

OBJECTIVE PD1: PRE-CONDITIONS

The following pre-conditions must be fully met before any construction activities commence.

A site meeting between the contractors and the representatives of the developer must take place at least 5 days prior to commencement of construction work to:

- Demarcate micro construction sites, services routes, access routes, working boundaries and no-go areas;
- Discuss methods of stockpiling (vegetation, topsoil, sub-soil, shell-grit, etc);
- Check required toilets and fire-fighting facilities to be in place;
- Discuss and agree restricted access to construction site;
- Sign the Declaration of Understanding (Contractors);
- Discuss and agree communication channels including contact details;
- Discuss and agree areas of responsibility;
- Discuss and agree the demarcation and control of construction and pipeline route.

Minutes of this site meeting must be kept, and are to be distributed to all parties.

The following equipment must be on every micro or sub site before any construction work is due to start:

- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.
- 1 x type ABC (all purpose) 12.5 kg fire extinguisher

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD2: LAYOUT PLAN CONTROLS

The contractor must ensure that a copy of the signed approved layout plan is available at the office on site at all times for inspection by the developer or his representative(s). Any variation to the approved layout plan must be submitted to the developer for signed approval and may only be implemented once the approved variation is available to the contractor and available on site at the office. The variation of changes to the layout must be approved by the competent authority as per the EA conditions.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD3: ADVERTISING

The contractors may place no advertising material on the property unless prior formal written permission has been obtained from the landowner. Any advertising placed on the development site must comply with the relevant local authority legislation.

This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE PD4: ENSURE THE DESIGN AND LAYOUT RESPONDS TO THE IDENTIFIED ENVIRONMENTAL CONSTRAINTS AND OPPORTUNITIES

Project Component/s	Facilities; Access.
Potential Impact	Design fails to respond optimally to the environmental consideration.
Activities/Risk Sources	Poor consideration of the natural landscape features.
Mitigation: Target/Objective	• Clearly demarcated laydown area and access roads. • Clearly demarcated no-go areas. • Clearly defined site development plan.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Plan and conduct pre-construction activities in an environmentally acceptable manner.	Developer	Pre-construction

Access roads to be carefully planned to minimise the impacted area and prevent unnecessary over compaction of soil.	Developer	Design phase
As far as possible, existing roads must be used.	Developer	Design phase
Clearly designed storm water cut-off channels and collection dams with alignment for storm water run-off from composting site.	Developer	Design Phase
Develop a site specific waste management plan for the construction phase.	Developer	Pre-construction
The holder of an environmental authorisation has the responsibility to notify the competent authority of any alienation, transfer and, change of ownership rights in the property on which the activity is to take place.	Developer	Pre-construction
Fourteen (14) days written notice must be given to the Department that the activity will commence. The notification must include a date on which the activity will commence as well as the reference number.	Developer	Pre-construction
ECO to be appointed prior to the commencement of any authorised activities. Once appointed the name and contact details of the ECO must be submitted to the DEA&DP.	Developer	Pre-construction

Performance indicator	Design meets objectives and does not degrade the environment. Design responds to the mitigation measures and recommendations in the specialist studies and the BA report. Minimal impact on the surrounding land uses.
Monitoring	Ensure that the design implemented meets the objectives and mitigation measures in the specialist studies and BA report through review of the design by the Project Manager, Developer and the Contract or prior to the commencement of construction.

OBJECTIVE PD5: ENSURE EFFECTIVE COMMUNICATION MECHANISMS WITH THE VARIOUS STAKEHOLDERS

On-going communication with affected and surrounding landowners and key departments is important to maintain during the construction and operational phases of the development. Any issues and concerns raised should be addressed as far as possible in as short a timeframe as possible.

Project Component/s	Access roads; Damage to existing infrastructure or private property; Nuisance; Congestion / obstruction of roads.
Potential Impact	Impacts on affected and surrounding landowners and land uses.
Activities/Risk Sources	Construction activities; Delivery of materials to site.
Mitigation: Target/Objective	Effective communication with affected and surrounding landowners; Addressing of any issues and concerns raised as far as possible in as short a timeframe as possible.

Mitigation: Action/Control		**Responsibility**	**Timeframe**
Compile and implement a grievance mechanism procedure for the public to be implemented during both the construction and operational phases of the facility. This procedure should include details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues.		Developer	Pre-construction, construction and operational phase
Performance indicator	Effective communication procedures in place.		
Monitoring	An incident must be reported in the site book and monitored by the ECO.		

CONSTRUCTION AND REHABILITATION PHASE
CIVIL CONTRACTOR

Goal for Construction Phase

Overall Goal for Construction (C):
Undertake the construction the development infrastructure in a way that:

- ensures that construction activities are properly managed in respect of environmental aspects and impacts;
- enables construction activities to be undertaken without significant disruption to other land uses in the area, in particular concerning noise impacts, dust, farming practices, traffic and road use, and effects on local residents;
- minimises the impact on the surrounding area;
- minimises impacts on avifauna and other fauna using the site; and
- minimises the impact on the heritage and historical value of the site
- minimise possible health impacts.

Objectives
In order to meet this goal, the following objectives have been identified, together with the necessary actions and monitoring requirements.

OBJECTIVE C1: WORKING HOURS

Civil & Construction Sites	
Mondays to Fridays	06h00 – 19h00
Saturdays & Public Holidays	06h00 – 17h00

Project Component/s	Development site; Access roads.
Potential Impact	Surrounding landowners and residents are exposed to noise; potential traffic congestion; and dust generated from the development site.
Activities/Risk Sources	Nuisance.
Mitigation: Target/Objective	• Effective communication with affected and surrounding landowners; addressing of any issues and concerns raised as far as possible in as short a timeframe as possible. • Construction activities should be restricted to weekday working hours. • Machinery and vehicles should be regularly maintained to prevent excessive noise. • All machinery and work activities must adhere to the requirements of the noise regulations. • Implement dust suppression if and when required. • Ensure delivery vehicles do not cause obstructions or delays to other road users through effective scheduling.

Mitigation: Action/Control	Responsibility	Timeframe
Contractors may only be present on the site during the public time hours.	Developer and contractor.	Construction phase.

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C2: SAFETY

Project Component/s	Development site; Access roads; Adjacent landowners / users.
Potential Impact	Increased activity in the area may result in safety risks.

Activities/Risk Sources	The proposed development may result in an increase in crime levels.
Mitigation: Target/Objective	To protect all involved from incidents, injury or death.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Telephone numbers of emergency services, including the local fire-fighting services, must be posted conspicuously in the contractor's office and near the telephone. No firearms are permitted on the construction site, other than those authorised by the developer for the property security service provider if needed. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a construction site.	Contractor	Construction phase

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C3: TRAFFIC / CONGESTION

Project Component/s	Development site; Access roads; Adjacent landowners / users.
Potential Impact	The construction machinery will only have a traffic impact on delivery to, and collection from the development site and are therefore regarded as negligible.
Activities/Risk Sources	The minor increase in traffic volumes at certain times of day will add to the existing traffic volumes. Deterioration of existing road as a result of heavy use by construction vehicles.
Mitigation: Target/Objective	• Avoid peak traffic hours (07h00 – 08h00 and 17h00 – 18h00) as far as possible; • Implementation of strict traffic safety measures and speed limits for all construction / delivery vehicles; • Road condition be monitored and, if need be, repaired to its original condition should any damage occur as a result of the development.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Implementation of strict traffic safety measures and speed limits for all construction / delivery vehicles. For security and safety reasons the speed limit on the property for all contractors' vehicles is 30 km per hour. The contractor is responsible for ensuring that all his employees, sub-contractors and delivery vehicles adhere to this rule.	Contractor	Construction phase

Performance indicator	Effective communication and procedures in place.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C4: CONTRACTOR'S CAMP

Project Component/s	Laydown area; Access roads.
Potential Impact	Degradation of the natural environment inside/outside of the laydown area.
Activities/Risk Sources	Setting up and operation of the contractor's camp.
Mitigation: Target/Objective	Construction camp must be neatly fenced and construction site must be neat and tidy.

Mitigation: Action/Control	Responsibility	Timeframe
The contractor's camp will be indicated by and to landowner management and the ECO on the site. The final location of the contractor's camp will be authorized by the ECO and landowner.	Developer / Contractor	Construction phase

Performance indicator	ECO in conjunction with the landowner will approve construction camp area.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C5: WASTE MANAGEMENT

Project Component/s	Development site.
Potential Impact	General construction waste will be generated during the construction phase. Poor waste management practices on site may lead to dumping and windblown litter creating a negative visual impact and nuisance for adjacent landowners / users as well as impacting the natural environment.
Activities/Risk Sources	• Dumping; • Windblown litter causing nuisance; • Pollution / degradation of the natural environment.
Mitigation: Target/Objective	• All waste generated, that is not recycled or re-used, on site shall be collected and disposed of at a registered landfill facility; • All safe disposal certificates and waste manifests from service providers to be kept and maintained; • All staff to receive training on correct waste management practices.

Mitigation: Action/Control	Responsibility	Timeframe
• A contractor appointed by the developer and engineer shall be tasked to ensure that waste management on site is conducted in accordance with NEMWA and applicable Regulations. • No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species shall occur. Such should be removed from the site to a suitable dumping site from which seed cannot escape. • The disposal of waste should be considered as a last resort after having considered the re-use and recycling of waste during the construction phase. • Waste minimisation should be implemented, such as the avoidance, reduction, re-use and recycling of waste during construction, before considering the disposal of such waste.	Contractor	Construction phase

Performance indicator	Waste management conducted in accordance with NEMWA and applicable Regulations. Adherence to the National Norms and Standards for the Storage of Waste in terms of Government Notice (GN) No. 926 of 29 November 2013.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C6: ARCHAEOLOGY AND PALAEONTOLOGY MANAGEMENT

Project Component/s	Development site.
Potential Impact	The loss of cultural or heritage resources.
Activities/Risk Sources	Destruction of cultural-historical features at the site will contribute to the loss of such features in the general area due to other non-related activities. This can at all times be mitigated to prevent/ minimise the loss of such features.
Mitigation: Target/Objective	To protect and mitigate the potential loss of cultural and heritage resources.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the provincial heritage resource authority of the Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999) via the ECO. Heritage remains uncovered or disturbed during earthworks must not be disturbed until inspection and verified by the professional.	Contractor	Construction phase

Performance indicator	Protection of heritage resources.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C7: FIRES

Project Component/s	Development site; Laydown / contractors camp.
Potential Impact	Uncontrolled fire on/off site, resulting in damage to the environment, property, injuries/death to personnel on site, or injuries/death to the public.
Activities/Risk Sources	Activities associated with facility construction / contractors camp.
Mitigation: Target/Objective	To protect and mitigate the safety of people, property, and the environment on and off site.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
No open fires will be allowed on site and adequate fire fighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.	Contractor	Construction phase

Performance indicator	No fire occurred to damage the surrounding environment and land uses and management actions are in place should a fire occur.
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C8: AN EFFECTIVE MONITORING SYSTEM TO DETECT ANY LEAKAGE OR SPILLAGE OF ALL HAZARDOUS SUBSTANCES DURING THEIR TRANSPORT, HANDLING USAGE AND STORAGE. THIS MUST INCLUDE PRECAUTIONARY MEASURES TO LIMIT THE POSSIBILITY OF OIL AND OTHER TOXIC LIQUIDS FROM ENTERING THE SOIL OR STORM WATER SYSTEMS

Project Component/s	Development site; Access roads.
Potential Impact	Contamination of soil, storm water and ground water resources by hazardous substances.
Activities/Risk Sources	The handling, storage and use of hazardous substances.

Mitigation: Target/Objective	Prevention and mitigation of the environment contaminated as a result of exposure to hazardous substances.

Mitigation: Action/Control	Responsibility	Timeframe
The EA holder, Land Owner, Site Environmental Officer and Environmental Control officer will do daily, weekly and monthly inspections and report and monitor compliance with the management actions included in the EMPr and EA conditions. These monitoring and reporting requirements are recorded in several sections of the EMPr. Monitoring will focus on signs of spillages and procedures during handling and storage of dangerous goods as described in the EMPr. The section on storage and handling of dangerous goods in the EMPr will be enforced.	Contractor	Construction phase

Performance indicator	Impacts on hydrological features minimized and mitigated
Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C9: DIESEL FUEL AND LUBRICANT HANDLING PROGRAMME

Project Component/s	Development site; Access roads.
Potential Impact	Contamination of soil, storm and ground water resources as a result of an oil/diesel/lubricant spill/leak.
Activities/Risk Sources	Activities associated with site construction; Activities associated with site operation.
Mitigation: Target/Objective	To protect and mitigate impacts of contaminants on the environment and hydrological features.

Mitigation: Action/Control	Responsibility	Timeframe
Servicing of construction vehicles and machinery to take place of site. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies. The following conditions related to the temporary fuel tanks must be implemented: The fuel tanks must be designed and installed in accordance with relevant Oil Industry standards and SANS codes where applicable for the aboveground storage tanks. The tanks must be located within a bund (110 % of the tanks capacity) in order to contain potential spills. During fuel tanker delivery, the tanker driver must be present at all times during product offloading. Should an incident occur the supply vehicle emergency cut-off switch must be activated to immediately stop fuel delivery. Flexible hoses with dry-break couplings and emergency isolation must be used. All spillage incidences and actions taken consequent thereto must be reported to the ECO and recorded in the site register. All fuel and flammable liquids should be stored under secure and fenced conditions and in a bunded site with the volume of the bunding capable of holding 110% of the liquid. The applicant must ensure that effective stock inventory monitoring and regular auditing take place for the early identification of possible leaks.	Contractor	Construction phase

The requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), must be adhered to. Within three months of the tanks ceasing to be used the tanks must be removed at the expense of the applicant, and the site, including all associated infrastructure must be rehabilitated to the satisfaction of the relevant authority. **Refuelling:** Refuelling of equipment must be conducted from the bunded fuel tank and pump at the contractor's camp. Fuel tanks must be bunded and supplied with a concrete apron. The concreted refuelling apron will be constructed with a drain along its extremities to collect any diesel contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container and process. Any spills on the concrete apron of floor below the tank are to be treated with OT8 or Spillsolve or equivalent as per the product instructions. A 500 litre drawn trailer to convey diesel to the equipment for re-fuelling may also be used. Such trailer will be drawn by a specified vehicle and driver, with alternate nominated as approved by the Project Engineer. Such tow vehicle may travel at 20kms per hour maximum at any time, be clearly identifiable as such, and may only tow the diesel cart should the pre requisite drip trays and emergency equipment be on the vehicle at the time. In situ refuelling activity may only take place during a standard specified daily time slot as displayed in the construction office, unless specific per day permission has been given to refuel at any other time by the ECO. This must be pre-recorded in the site record book. Staff will require instruction in the identification of diesel and oil leaks and the use of Spillsolve (or equivalent) products. **On-Site emergency repairs:** Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should not be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab. **Collection of contaminated spares and waste oils:** Contaminated spares, oil filters, gaskets, water, etc. will be collected in separate holders at the designated storage facility for disposal at a licensed H:h site. Staff will require instruction in: • Deleterious effects of oil / fuel on the environment • Identification of oil leaks • Handling of oil / fuel leaks into soil • Location and method in storage of contaminated spares • Fire prevention and emergency drills in case of an accident		

Performance indicator	Ensure that no spillages occur and if it does occur that it is handled and cleaned up accordingly.

Monitoring	This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C10: APPROPRIATE HANDLING AND STORAGE OF CHEMICALS, HAZARDOUS SUBSTANCES AND WASTE (WASTE MANAGEMENT PLAN)

The construction phase may involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents. The main wastes expected to be generated by the construction of the pipeline will include will include predominantly general solid waste in minimal amounts and potentially liquid waste, which may include hazardous waste.

Project Component/s	Access roads; Construction camp / Laydown area; Storage areas.
Potential Impact	• Release of contaminated water from contact with spilled chemicals. • Generation of contaminated wastes from used chemical containers. • Inefficient use of resources resulting in excessive waste generation. • Litter or contamination of the site or water through poor waste management practices. • Pollution of water and soil resources.
Activities/Risk Sources	• Vehicles associated with site preparation and earthworks. • Packaging and other construction wastes. • Hydrocarbon use and storage. • Spoil material from excavation, earthworks and site preparation.
Mitigation: Target/Objective	• To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons. • To ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons. • To comply with waste management guidelines. • To minimise production of waste. • To ensure appropriate waste storage and disposal. • To avoid environmental harm from waste disposal.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
• Implement a site specific waste management plan during the construction phase. • Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. • Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures. • Implement an effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. • Leakage of fuels must be avoided at all times and if spillage occurs, it must be remediated immediately. • In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents. • Spilled cement, fly ash and concrete must be cleaned	Contractor	Construction phase

up as soon as possible and disposed of at a suitably licensed waste disposal site. • Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility. • All stored fuels to be maintained within a sealed bund and on a sealed surface. The bund must be at least 110% of the volume of the total containers. • Adjacent fuelling areas situated around fuel tanks must be provided with an impervious layer or drip trays must be used during refuelling. • Areas around fuel tanks must be appropriately bunded or contained in an appropriate manner as per the requirements of SABS 089:1999 Part 1. • Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function. • Oily water from bunds at the substations must be removed from site by licensed contractors. • The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDS files. • Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with and copies kept on site in the environmental file. • Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. • Construction sub-contractors must provide specific detailed waste management plans to deal with all waste streams. • Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap) and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control. • Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.). • Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors and disposal at appropriately licensed waste disposal sites. • Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area. • Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal and copies of the safe disposal slips must be kept in the environment file on site. • Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any		

regulated waste. Waste disposal records must be available for review at any time. • An incident/complaints register must be established and maintained on-site. • The sediment control and water quality structures used on-site must be monitored and maintained in a fully operational state at all times. • An integrated waste management approach that is based on waste minimisation must be used and must incorporate reduction, recycling, re-use and disposal where appropriate • Upon the completion of construction, the area must be cleared of potentially polluting materials. • Dispose of all solid waste collected at an appropriately registered waste disposal site. Waste disposal shall be in accordance with all relevant legislation and under no circumstances may waste be burnt on site. • Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management. • The storage of waste must comply with the National Environmental Management: Waste Act, (Act No. 59 of 2008) National Norms and Standards for Storage of Waste, 2013.		

Performance indicator	• Limited chemical spills outside of designated storage areas; • No water or soil contamination by spills; • No complaints received regarding waste on site or indiscriminate dumping; • Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately; • Provision of all appropriate waste manifests for all waste streams.
Monitoring	• Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase; • A complaints register must be maintained, in which any complaints from the community will be logged; • Observation and supervision of waste management practices throughout construction phase; • Waste collection will be monitored on a regular basis; • Waste documentation completed; • A complaints register will be maintained, in which any complaints from the community will be logged; • Complaints will be investigated and, if appropriate, acted upon; • An incident reporting system will be used to record non-conformances to the EMPr; This will be monitored by the ECO during site visits and recorded, reported and proof included in the audit report to be submitted once construction is completed.

OBJECTIVE C11: EFFECTIVE MANAGEMENT OF CONCRETE BATCHING AREA

Project Component/s	Concrete batching area.
Potential Impact	• Dust emissions. • Release of contaminated water, pollution of ground water resources. • Ground, soil pollution. • Generation of contaminated wastes from used chemical containers. • Inefficient use of resources resulting in excessive waste generation.

Activities/Risk Sources	• Operation of the batching area. • Packaging and other construction wastes. • Hydrocarbon use and storage. • Spoil material from excavation, earthworks and site preparation.
Mitigation: Target/Objective	To ensure that the operation of the batching area does not cause pollution to the environment or harm to persons.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
• Concrete batching areas to be sited such that impacts on the environment or the amenity of the local community from noise, odour or polluting emissions are minimised; • Access and exit routes for heavy transport vehicles should be planned to minimise noise and dust impacts on the environment; • The concrete batching area should demonstrate good maintenance practices, including regular sweeping to prevent dust build-up; • The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a sheltered position to minimise the effects of the wind; • Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and reduce water usage; • The site should be designed and constructed such that clean storm water, including roof runoff, is diverted away from contaminated areas and directed to the storm water discharge system; • Any liquids stored on site, including admixtures, fuels and lubricants, should be stored in accordance with applicable legislation; • Contaminated storm water and process wastewater should be captured and recycled where possible. A wastewater collection and recycling system should be designed to collect and filter contaminated water; • Process waste water and contaminated storm water collected from the entire site should be diverted to a settling pond, or series of ponds, such that the water can be reused in the concrete batching process. The settling pond or series of ponds should be lined with an impervious liner capable of containing all contaminants found within the water they are designed to collect; • Areas where spills of oils and chemicals may occur should be equipped with easily accessible spill control kits to assist in prompt and effective spill control; • Ensure that all practicable steps are taken to minimise the adverse effect that noise emissions. This responsibility includes not only the noise emitted from the plant and equipment but also associated noise sources, such as radios, loudspeakers and alarms; • Where possible, waste concrete should be used for construction purposes at the batching area or project site; • The batching area to be monitored by the ECO to ensure that the plant is operating according to its environmental objectives and within legislative requirements.	Contractor	Construction phase

Performance indicator	• No complaints regarding dust or contamination; • No water or soil contamination by chemical spills; • No complaints received regarding waste on site or indiscriminate dumping.
Monitoring	Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. An incident reporting system will be used to record non-conformances to the EMPr. Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OBJECTIVE C12: DUST MANAGEMENT

Project Component/s	General construction activities; Concrete batching area; Transport of materials to and from sites.
Potential Impact	Create a nuisance to property owners / users adjacent to the development.
Activities/Risk Sources	Windblown dust from stockpiles, excavated or cleared areas, and which vehicles may be entrained may affect property owners / users adjacent to the development.
Mitigation: Target/Objective	• Dust suppression by wetting / covering stockpiles; • Limit vehicle speeds for all vehicles.

Mitigation: Action/Control	**Responsibility**	**Timeframe**
• Dust suppression by wetting / covering stockpiles; • Limit vehicle speeds for all vehicles. • Ensure compliance with the provisions as set out in the National Environmental Management: Air Qualify Act (NEM: AQA), National Dust Control Regulations (Notice 827 of 2013).	Contractor	Construction phase

Performance indicator	No complaints regarding dust.
Monitoring	A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OBJECTIVE C13: NOISE CONTROL

Project Component/s	General construction activities; Concrete batching area; Transport of materials to and from sites.
Potential Impact	Create a nuisance to property owners / users adjacent to the development.
Activities/Risk Sources	Noise from construction vehicles and machinery during construction.
Mitigation:	Ensure construction vehicles and machinery operates in compliance

Target/Objective	with the Western Cape Noise Control Regulations (P.N. 200/2013).

Mitigation: Action/Control	Responsibility	Timeframe
• Construction and deliveries may only be conducted during working hours as defined in C1 above. • Ensure compliance with the provisions as set out in the Western Cape Noise Control Regulations (P.N. 200/2013).	Contractor	Construction phase

Performance indicator	No complaints regarding dust.
Monitoring	A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.

OPERATIONAL PHASE

This following section defines the management programme for each of the identified goals during the operational phase. The programme is presented in the form of a table, which includes the components described. This programme consists of the following components:

Goals
Over-arching environmental goals for the management phase.

Objectives
The objectives are in place in order to meet these goals. These take into account the findings from existing studies and monitoring programmes.

Management Actions
The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.

Monitoring
*K*ey actions to verify that objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

Criteria/ Targets
The criteria or targets indicate the efficacy of the management programme. The targets should be readily measurable, understandable to the layperson, cost-effective to monitor, and meet legal requirements.

Remedial Actions
Specifies actions needed to be taken if the targets are not met; or if there is an unforeseen event.

Goals
The following are specified goals:

Goal 1: Storm water management
Goal 2: Waste Management
Goal 3: Noise
Goal 4: Flies
Goal 5: Odour
Goal 6: Pesticides
Goal 7: Trucks
Goal 8: Site Hygiene
Goal 9: Monitoring and Control
Goal 10: Safety Measures and Emergency Procedures

Goal 11: Employment / Security
Goal 12: Water Pollution and Irrigation of biodegradable industrial wastewater to agricultural land

Goal 1: Storm Water Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure effective storm water management on site.	Infrastructure failure, Pollution into the receiving environment, offensive odours and health risks.	1. Regular inspection and maintenance of storm water handling; 2. Infrastructure failure reported or identified to be fixed as a priority.	Internal audit of the facility to ensure compliance with relevant legislation.	Storm water management plan in place and implemented.	• If pollution is detected as a result of infrastructure failure immediate action must be taken to contain the pollution. • Within 24hours of detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of pollution that occurred specialists may be contacted to provide specific recommendations. • An incident report to be compiled and sent to the municipal and relevant governmental authorities. • In the event of a pollution event / incident the Municipality should inform and provide awareness to surrounding property owners / users.

Goal 2: Waste Management

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Waste management practices on site are compliant in terms of relevant legislation.	Poor waste management can result in the following: Nuisance; Windblown litter; Pollution of the receiving environment.	The disposal of waste should be considered as a last resort after having considered the re-use and recycling of waste during the construction phase. Waste minimisation should be implemented, such as the avoidance, reduction, re-use and recycling of waste during operation, before considering the disposal of such waste. All recyclable waste to be composted. The composting area and waste storage area shall be operated in such a manner that no health hazard or nuisance conditions occur, such as noise, odour, vectors and windblown litter. Development and implementation of an on-site waste management plan. All other waste to be collected in sealed bins	Internal audit of the facility to ensure compliance in terms of relevant legislation. Adherence to the National Norms and Standards for the Storage of Waste in terms of Government Notice (GN) No. 926 of 29 November 2013, if the volumes of waste stored exceeds $80m^3$ for hazardous waste and/or $100m^3$ for general waste. Compost facility to be operated in accordance with the *Draft National Standards for Organic Waste Composting (Notice 68 of 2014).* *Waste Minimisation Guideline for Municipalities, 2015 (DEADP:WC).*	On-site waste management procedure for non-recyclable waste for employees is in place and implemented.	• If pollution is detected as a result of infrastructure failure immediate action must be taken to contain the pollution. • Within 24hours of detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further rehabilitation methods to be implemented. • Depending on the type and extent of pollution that occurred specialists may be contacted to provide specific recommendations. • An incident report to be compiled and sent to the municipal and relevant governmental authorities. • In the event of a pollution event / incident the Municipality should inform and provide awareness to surrounding property owners / users.

		and removed to a licenced waste disposal facility weekly or as soon as the bins are full. Provide employees with sound waste management training.			

Goal 3: Noise

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Noise generated during the operation of the facility.	Nuisance - A compost turner, front loader and tractor on site will contribute to noise, but are all agricultural related implements that are associated with buffer areas.	Ensure that noise generated by machinery used during the general operation of the facility is in accordance with the Western Cape Noise Control Regulations (P.N. 200/2013).	Internal audit to ensure compliance with the Western Cape Noise Control Regulations (P.N. 200/2013).	Manage and control noise to be within the limits of the Western Cape Noise Control Regulations (P.N. 200/2013).	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

Goal 4: Flies

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
To mitigate and control the attraction of excessive flies as a result of the facility.	Nuisance Pests Health risks	• All by-products are covered immediately on delivery which reduces the numbers of flies to a large extent. • The composting process will control the spread of diseases through correct management of temperature and ph. No larva/eggs/worms/bacteria can live in the desirable	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

		55ºC within the windrows. • In addition, the rows are also treated with chemicals such as Neoprene from Coopers which is aimed at killing the eggs and larvae of the flies. Baycidal and Temprid from Bayer are also used to kill the flies and larvae. Quik Bayt is dry crystals which attracts and kills flies on contact and are placed at several points around the site.			

Goal 5: Odour

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
The balance of PH, temperature, air, moisture are critical parameters to ensure correct fermentation/digestion without causing odour or any other problems in the composting facility.	Nuisance Offensive odours Health risk	Much is published in literature about potential emissions from piggeries in general, but very few emissions have been quantified, so much so that the United States of America's Environmental Protection Agency (USEPA) does not provide any emission factors in its Compilation of Air Pollutant Emission Factors, AP-42, Volume I: Stationary Point and Area Sources (AP-42). According to literature many odorous compounds can be emitted, such as mercaptans, hydrogen sulphide (H_2S),	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

		skatole, thiocresol, thiophenol and ammonia (NH_3), but quantitative details of such emission are extremely scarce. Literature also states that by far the major source of odorous emission result from manure effluent handling activities and that the two gases most commonly associated with odours from these operations are NH_3 and H_2S. The investigation and literature review showed that approximately 52.7% of NH_3 emissions originated in the sheds and effluent system while the remainder (47.4%) originated in the effluent handling system. Of the H_2S generated, approximately 31.1% originated in the sheds and effluent system while the remainder (68.9%) originated in the effluent handling system[2]. The maximum annual concentration of NH_3 is estimated to be 340 µg/m^3 and will occur roughly at the centre of the pig farming operation. The maximum 99-percentile concentration is estimated to be 1.84 mg/m^3 and will occur in the same area. The maximum annual			

[2] Ammonia and Hydrogen Sulfide Emissions from Swine Production Facilities in North America: a Meta-Analysis; Z. Liu and W.J. Powers; SWINE DAY 2013.

		concentration of H_2S is estimated to be 8.3 µg/m^3 and will occur in the immediate area of the effluent dams. The maximum 95-percentile concentration is estimated to be 45.1 µg/m^3 and will occur in the same area. An uncertainty in the possible spread of odours does, therefore, exist, but as H_2S is one of the gases with the lowest odour detection level, its presence will most likely be detected before any other gaseous compound. The predominant wind directions are east to south-easterly and west to south-westerly, which implies that pollutants will disperse mainly in west to north-westerly and east to north-westerly directions from the location of the proposed piggery. This value of NH_3 is substantially lower than the odour recognition threshold of 33.2 mg/m^3. The ammonia odours may spread over an extended area, but its concentration is not expected to be of a level where it can be recognised as NH_3. H_2S, however, is expected to be above the odour recognition threshold. The minimum scale is set to the odour recognition threshold of H_2S and may be			

		recognised. Therefore, the impact of the proposed piggery on air quality in the general area will be low, but that some nuisance due to odorous emissions can be caused in the area surrounding the piggery farm from time-to-time. It is recommended that a row of trees on all sides of the sheds and on the upwind sides of the aeration dams, be plant that will diffuse pollutants emitted from the various sources, thus reducing the dispersion footprint.			

Goal 6: Pesticides

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
The windrows are treated with chemicals such as Neoprene from Coopers which is aimed at killing the eggs and larvae of the flies. Baycidal and Temprid from Bayer are also used to kill the flies and larvae. Quik Bayt is dry crystals which attracts and kills flies on contact and are placed at several points around the site.	Water contamination Health risk	Pesticide application near rivers, wetlands and other fresh water resources should be minimised and applicable types of pesticides (non-persistent) should be applied. The following procedures will assist in the environmentally safe use of pesticides and chemicals: • Pesticide containers should be stored in a weather-proof and fire resistant building that is maintained in good	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

		condition. Pesticide containers should be stored on an impermeable base; • A sump to contain and decant spills during pesticide preparation would be fortuitous; • Unused pesticide and contaminated disposable equipment should be disposed of correctly to ensure reduce risk of environmental contamination; • Empty pesticide containers should not be burned or buried as it could be a risk to human health and may contaminate soil and groundwater resources.			

Goal 7: Trucks

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Dust Noise Obstruction of DR 1377	Nuisance	Existing access roads will be used. The facility uses the gravel road to Hermon for operational purposes. The applicant spends two years ago R 3 million to gravel surface the road and grade the road when required. The expanded facility will generate 676 trips per year in order to operate the facility. The existing access road is sufficient for the proposed expansion and the applicant will continue to grade and maintain the road when required.	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

Goal 8: Site Hygiene

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Site hygiene at the composting facility.	Nuisance Offensive odours Pests Health risk	Managed in terms of Pork 360 guidelines	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

Goal 9: Monitoring and Control

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Monitoring and control of processes at the facility to ensure that activities do not cause negative impacts.	Nuisance Offensive odours Pests Health risk	Managed in terms of Pork 360 guidelines	Will be monitored regularly. Problems experienced / complaints received will be recorded in a complaints register and addressed when required.	Problems experienced / complaints received and recorded in the complaints register must be addressed.	• Opening of a complaints register and addressing and investigating reported complaints; • Monitoring and recording of processes to ensure consistency.

Goal 10: Safety Measures and Emergency Procedures

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensure that emergency protocol has been developed and is in place for the facility.	Fire; Disaster; Pollution; Death; Loss of Infrastructure.	Development and implementation of emergency procedures and plans to ensure the safety of employees, business.	Internal audit to ensure compliance with procedures and applicable legislation.	Procedures developed, implemented and regularly updated.	Development and implementation of Emergency Procedures in line with applicable legislation and standards.

Goal 11: Employment / Security

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensuring the safety of workers and adjacent landowners.	Crime.	• The application site has two controlled access gates and no unauthorized persons are allowed on site. A site access register will be kept on site.	Internal audit to ensure compliance with procedures and applicable legislation.	Procedures developed, implemented and regularly updated.	Development and implementation of Emergency Procedures in line with applicable legislation and standards.

Goal 12: Water Pollution and Irrigation of Biodegradable Industrial Wastewater to Agricultural Land

Objectives	Risks	Actions	Monitoring	Criteria/Targets	Remedial Actions
Ensuring that surface, ground water resources, and soil is not contaminated through run-off or leachate.	Pollution; Loss of resources; Habitat destruction.	It is not anticipated that the impact will be high. "Biodegradable industrial wastewater" from a Confined Animal Feeding Operation as defined and as set forth in the GN 665 of 06 September 2013 for Section 21 (e) activities and can be reused via irrigation in accordance with the recommendations for the application of wastewater to agricultural land presented in the prescribed Water Research Commission Guidelines (as detailed under subsection 1.10 of the schedule). It is noteworthy that the piggeries accord with the latest upgrades in terms of	Internal audit to ensure compliance with procedures and applicable legislation. That the biodegradable industrial wastewater is disposed onto the onsite available 400ha agricultural lands and that a 100m buffer area between the Berg River and non-perennial drainage lines is excluded from the irrigation areas to protect possible pollution of the water sources. Monitoring on a regular basis as determined by the results obtained is a general	Procedures developed, implemented and regularly updated.	Development and implementation of Emergency Procedures in line with applicable legislation and standards.

		the confined animal feeding operation housing and wastewater treatment technology, with the biodegradable industrial wastewater generated representing a controlled wastewater consisting of manure (faeces and urine) and washwater, thus fully complying with the definition provided in the Schedule of organic waste being “of non-anthropogenic origin that is readily biodegradable in the environment and does not contain any toxic substances that may accumulate in the environment”. The subsequent Primary Treatment conducted accords with the definition provided in the Schedule as “treatment of wastewater by a physical process, which may involve maceration, sedimentation, screening and grit removal”. The final classification of the solids and liquid fractions produced accord with the Unrestricted Use as detailed in the applicable Guidelines for the Utilisation and Disposal of Wastewater Sludge, Volume 2 of 5: Requirements for the Agricultural Use of Wastewater Sludge – WRC	recommendation. This is particularly relevant due to the vicinity of the Berg. The borehole quality must be monitored twice per year. The river upstream sample site may require more frequent quarterly monitoring to assess the high and low impact periods. The water resources (and wastewater liquid fraction reused) must be monitored biannually as per the recommended guidelines for inorganic chemistry physico-chemical properties, andmicro-biological indicator organisms to ensure no adverse impact occurs. Yields therefrom must be recorded with agronomic production rates and soil composition monitored to support the beneficial reuse of the liquid fraction. General Restrictions that apply include: • Sludge may be stored in suitable facilities (design to ensure minimal		

		TT 262/06. All cleaning chemicals used intermittently when cleaning a platform on a site are registered products for animal housing facilities and used in accordance with the product instructions and do not contribute any contaminants to the wastewater generated. All veterinary products used are done so under guidance from consultant veterinarians with the required separate medical waste disposal methods adhered to and audited by the consultant veterinarians. The introduction of a Separator Stage (press separator) to the grower site allows the fractions generated to represent an additional environmental benefit to the area as per the stated policy advocated by the DWS in which the beneficial reuse of the wastewater is encouraged, with benefits including those for utilizing the nutrients (nitrogen, phosphorus and potassium) and organic carbon for both soil condition and enhanced crop production. The WRC Guideline	impact on environment). • Actions must be taken to reduce odours and vector attraction. Application rate must <10 tons dry mass/ha/year. • Nutrient loading limits apply • Slope and land preparation must not result in soil erosion or potential surface runoff. • Buffer zones required: ○ Depth to aquifer > 5 m ○ Distance from surface water/borehole > 100m ○ Application to land >500m away from dwellings. • Relaxation from buffer zones may be applied for on condition that proof is provided that the water resource or		

		Classification for the compost solids fraction is unrestricted, enabling beneficial use thereof off-site. Classification: Pollutant Class: A: Thus: (a) Agricultural Use is an acceptable option. (b) No additional restrictions or requirement apply and (c) Could be used as a saleable product. Typical Pig Slurry composition consists of 4.2kg/Nitrate/1000l, 41.4kg/Phosphate/1000l and 2.2kg/Potash/1000l The raw wastewater generated on site will contain 4.2 kg N/1000L. The DWS Section 21 e Permitted Application Rates of 320 – 450 kg Nitrate (N)/ha/y. Therefore 128 000 L/ha/y at 320 320 kg N/ha/y and 180 000 l/ha/y at 450 kg N/ha/y on the available 400ha for irrigation. Take note that the property is bigger, but that the available area for irrigation is 400ha due to the exclusions of the 100m buffer areas. The facility will produce 1080 m^3 (1 080 000l) of biodegradable industrial wastewater per week with a	odour control or vector attraction area adequately protected or implemented. • Monitoring must be performed for: o Sludge o Soils Record Keeping must be in place for these aspects listed and application volumes and areas.		

		total of 56 160 000 l/y. At the lower limit of the DWS Section e disposable rate the facility will irrigate 51 200 000l/y and at the upper limit 72 000 000l/y. This is well within the range that is stipulated by DWS in the guidelines for N and the irrigation of the expanded facility biodegradable industrial wastewater will not result in the pollution of the soil from an N parameters. DWS Section 21 e Permitted Application Rates of 320 – 450 kg Nitrate (N)/ha/y. Therefore 128 000 L/ha/y at 320 320 kg N/ha/y and 180 000 l/ha/y at 450 kg N/ha/y on the available 400ha for irrigation. Take note that the property is bigger, but that the available area for irrigation is 400ha due to the exclusions of the 100m buffer areas. The facility will produce 1080 m^3 (1 080 000l) of biodegradable industrial wastewater per week with a total of 56 160 000 l/y. At the lower limit of the DWS Section 21e disposable rate the facility will irrigate 51 200 000l/y and at the upper limit 72 000 000l/y.			

		This is well within the range that is stipulated by DWS in the guidelines for N and the irrigation of the expanded facility biodegradable industrial wastewater will not result in the pollution of the soil from an N parameters. The use of these fractions are preferred to the use of inorganic fertilisers as the N-fraction in the inorganic fertilisers is inorganic nitrate-N which represents a greater risk of leaching towards water resources when compared to the ammonia-N fractions from the biodegradable industrial wastewater. It should be noted that the wastewater generated by the piggery is significantly of lower risk than that generated from other industry sectors and domestic wastewater, predominantly as it is controlled and does not contain pollutants or contaminants (refer to the Water Research Commission on Dialogues of Contaminants of Emerging Concern 2015)[3].			

[3] Dr JA Meyer 06.01.2017. Water Use and Waste Handling Practices For HUMPHRIES BOERDERY (Pty) Ltd. Response to Questions from the Department of Agriculture Limpopo Province re: Draft BAR for Humphries Tweefontein Production Facility Ref No: HUM-BEL-15.09.29.

		Since the liquid fraction should contain no solids/fibre, thus less crust should form (crusts contribute to anaerobic conditions and further purification of liquid and consequently odour issues). Several researchers have observed that NPK values for pig manure were similar between different countries (Conn et al., 2007; Moore et al., 2005; and Sanchez and Gonzalez, 2005). Fertilizer values for liquid and solid fractions are also viewed as similar. Differences are observed between various livestock types regarding manure composition. Ruminant manure tends to have lower P compared to poultry and pig manure due to a better plant-bound P extraction ability (Bailey and Buckley, 1998). As reported by the authors pig manure, although subject to variation from production system factors, is regarded as generally having the following composition: • 50 % N in the ammonium (inorganic) form • 50% in the organic form			

		(microbial, labile organic, stable In terms of land application the considerations are a combination of benefits and potential concerns, thus balancing crop requirements with potential adverse environmental impacts. During the growing season 20% of the organic N form is reported to mineralize and thus be available for plant uptake. Of the inorganic fraction 25% of the ammoniacal N may be lost due to volatilization. Collectively this implies a net availability of ca. 50% of the applied N for crop production. NH4-N losses may also vary largely, with 10 – 99% ranges recorded. Losses were the highest from anaerobic lagoons. Whilst P & K were viewed to be relatively stable with 5 – 15% losses reported, the highest potential loss was that of P (up to 50%) due to runoff and/or leaching. Kachanoski et al. (1997) reported that the ammonium form may be increased to 60 – 90%.organic). This is one of the reasons why Water resource quality monitoring emphasizes demonstrating that the storage of wastewater does			

		not enter or cause impact on existing water resources, and why lagoons should be lined. According to Sutton et al. (1984) other concerns relate to dietary composition and potential increases to applied areas in NaCl and trace elements (As, Se, Cu, etc.). Similar concerns are noted by Lukehurst et al. (2010) and dealt with by the WRC TT Guidelines referred under the relevant sections of the NWA.[4]			

[4] Dr JA Meyer 06.01.2017. Water Use and Waste Handling Practices For HUMPHRIES BOERDERY (Pty) Ltd. Response to Questions from the Department of Agriculture Limpopo Province re: Draft BAR for Humphries Tweefontein Production Facility Ref No: HUM-BEL-15.09.29.

CHAPTER 8

ENVIRONMENTAL REPORTING

In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting shall be undertaken:

- Incident reporting; and
- Compliance reporting

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

ENVIRONMENTAL INCIDENT REPORT

DATE:	**File Ref:**
NAME:	**Copy to:**
EXACT LOCATION OF INCIDENT:	

SECTION 1 : DESCRIPTION OF INCIDENT

SECTION 2 : REMEDIAL ACTION REQUIRED

Remedial Action Due Date:
Confirmation of implementation: Name: **Date:**

SECTION 3 : RELEVANT DOCUMENTATION

SECTION 4 : SIGNATURES

Municipal Engineer:

.....

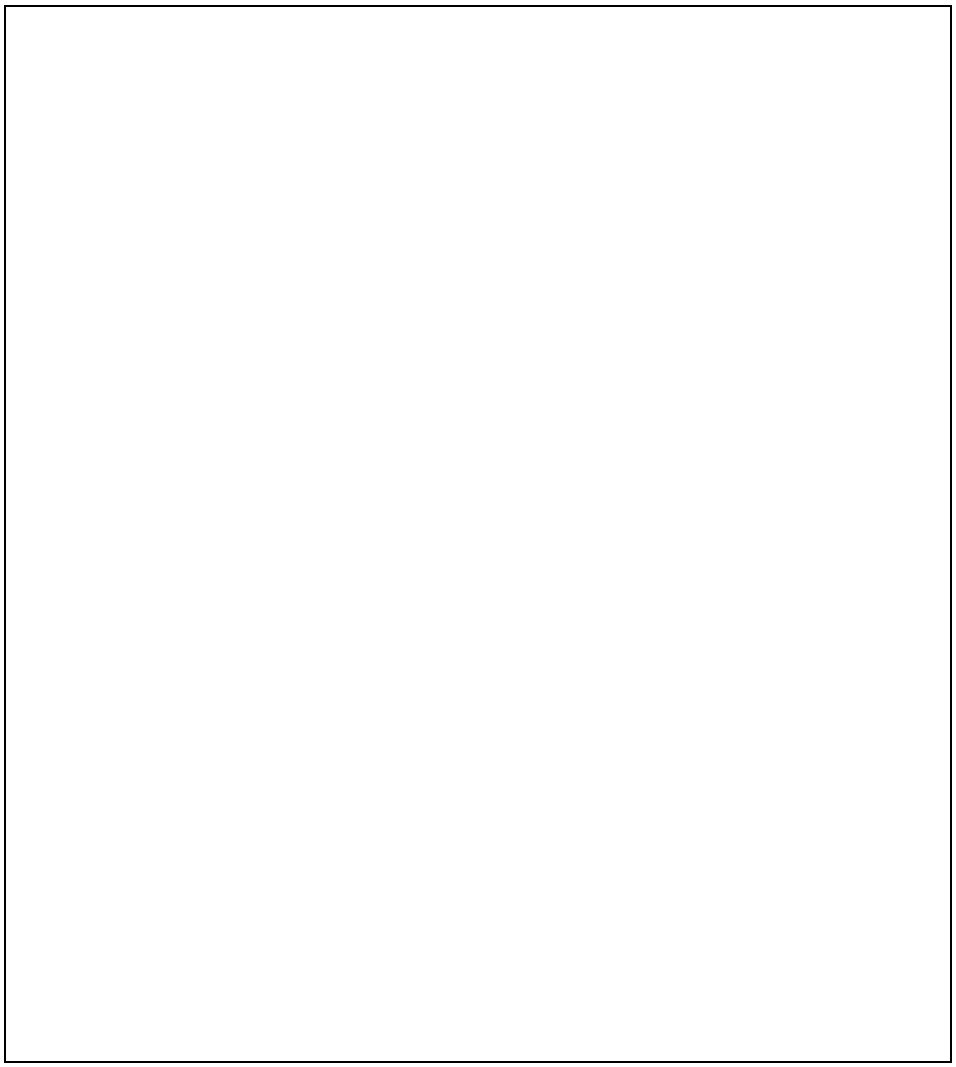
Name:
Date:

ECO:

.....

Name:
Date:

SECTION 5: DRAWING/SKETCH



CHAPTER 9

DECOMMISSIONING PHASE

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased.

The decommissioning phase EMP provides specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project.

Closure and decommissioning impacts are likely to be similar to the construction phase impacts. The management actions and control under the construction phase EMP need to be implemented to mitigate the negative impacts on the environment and to restore the property to its natural state.

A decommissioning phase is where a structure is removed or otherwise modified to make it incapable for re-use for the original design purpose.

The results of environmental monitoring during the decommissioning phase will be used to assess the impact of the decommissioning on the surrounding environment and demonstrate compliance with regulatory requirements.

The actual scope of the decommissioning environmental monitoring will be established following consultation with the regulatory authorities. The format of decommission management strategy will probably be similar to that of earlier development phases and consist of the following:

- Management Principles
    - Develop monitoring procedures in accordance with standard protocols and the requirements of the environmental legislation.
    - Undertake environmental monitoring during the decommissioning phase as shown below.

Environmental monitoring during the decommission phase will include terrestrial flora rehabilitation monitoring.

CHAPTER 10

REHABILITATION SPECIFICATIONS AND SITE CLEAN-UP

The contractors must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during construction activities, are removed once the project has been completed. The construction sites must be cleared, and cleaned to the satisfaction of the developer.

Stabilisation and rehabilitation must take place immediately after construction operations have been completed. No vehicles or unauthorised personnel must be allowed onto areas that have been rehabilitated.

The areas impacted during construction must be stabilised and shaped according to the natural surrounding contours. If topsoil was removed during construction the topsoil must be used to stabilise the impacted areas.

If erosion occurred the ECO must be informed immediately who will then recommend erosion mitigation measures to be implemented.

Alien vegetation monitoring of the rehabilitated areas and surrounds must be conducted on an annual basis and if alien vegetation is detected the ECO must be informed immediately who will then recommend eradication methods.

CHAPTER 11

ENVIRONMENTAL AWARENESS INDUCTION COURSE MATERIAL

This section of the report is included in compliance with Section 24N (3) (c) of the National Environmental Management Act 107 of 1998.

WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe

WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A Policy and System will be signed

HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP

WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times

RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream

ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site

TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers

SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission

PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed

DUST

Try to avoid producing dust

NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles

TOILETS

- Use the toilets provided
- Report full or leaking toilets

EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins

RUBBISH

- Do not litter – put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly

TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers – check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police: 10111

FINES AND PENALTIES

- Spot fines of between R20 and R2000
- Your company may be fined
- Removal from site
- Construction may be stopped

PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!

WASTE MANAGEMENT

- Waste minimization
- Reduce, reuse, recycle
- Separation at source

ATTENDANCE REGISTER FOR ……	
PLACE ……..	TRAINER……
NAME & SURNAME	SIGNED
SIGNED ……	DATE & TIME ……

CHAPTER 12

COMPLIANCE WITH THE ENVIRONMENTAL AUTHORISATION

All conditions of the Environmental Authorisation must be adhered to onsite during the construction-, operational-, decommissioning- and rehabilitation phases of the proposed project. A copy of the Environmental Authorisation must be available on site together with the EMP and all contractors on site must sign the Declaration of Understanding as proof of awareness and understanding of all the conditions to be adhered to on site in terms of the EA and EMP.

CHAPTER 13

UPDATING/ADAPTING THE EMP

Although care has been taken to address all known relevant environmental issues for the development, it will become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMP. Only those additions to, or amendments of, this EMP that will either improve environmental protection or can be proven not to have any negative effects would be considered to be included, and any amendments to the EMP must first be approved by the ECO and competent authority/ies i.e. DEA&DP.

REFERENCES

City of Cape Town (2002) Environmental Management Programme (Version 5) for Civil Engineering Construction Activities.

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Department of Water Affairs and Forestry, February 2005. Environmental Best Practice Specifications: Construction Integrated Environmental Management Sub-Series No. IEMS 1.6. Third Edition. Pretoria.

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Dr JA Meyer 06.01.2017. Water Use and Waste Handling Practices For HUMPHRIES BOERDERY (Pty) Ltd. Response to Questions from the Department of Agriculture Limpopo Province re: Draft BAR for Humphries Tweefontein Production Facility Ref No: HUM-BEL-15.09.29.

Ammonia and Hydrogen Sulfide Emissions from Swine Production Facilities in North America: a Meta-Analysis; Z. Liu and W.J. Powers; SWINE DAY 2013

http://www.pork360.co.za/bio-security/

ANNEXURE 1

LEGEND:

- Concerned property
- Local municipal boundary
- Site 1, 2, 3 and 4
- Existing development
- New building development
- Sludge Dam
- New Composting area

Site 3
Growing
±9.7Ha

Site 1
Breeding
±5.8Ha

4/649
424.1116Ha

Swartland Mun

Drakenstein Mun

Sludge Dam
Proposed Composting Area
±1.3Ha
±1.4Ha
Site 4

Site 2
Weaning
±1.7Ha

SITE DEVELOPMENT PLAN
Proposed expansion of existing Piggery

PTN 4 OF THE FARM GROOTVERLANGEN NO 649
MALMESBURY RD

NOTE:
ALL SIZES AND DISTANCES ARE SUBJECT TO SURVEY

CREATED BY:

C.K. RUMBOLL & PARTNERS
TOWN & REGIONAL PLANNERS
PROFESSIONAL LAND SURVEYORS
16 RAINIER STREET, MALMESBURY
Tel: 022 - 4821845
Fax: 022 - 4871661
e-mail: iana@rumboll.co.za

DATE:	SCALE:
NOVEMBER 2017	N. T. S
REF: MAL/9244/IJ	NORTH

Rooihoogte Piggery Expansion - Biodiversity

Legend

Rivers (Strahler Stream Order)

- 5
- 4
- 3
- 2
- 1
- Other Natural Area

BSP ESA: Restore

- ESA2: Restore from plantation or high density IAP
- ESA2: Restore from other land use
- ESA2: Restore where appropriate (CT)

BSP ESA

- ESA: Aquatic
- ESA: Terrestrial

BSP CBA: Degraded

- CBA2: Aquatic
- CBA2: Terrestrial

BSP CBA

- CBA: Terrestrial
- CBA: Terrestrial (CT)
- CBA: Forest
- CBA: River
- CBA: Estuary
- CBA: Wetland
- CBA: Aquatic (CT)

Scale: 1:18 056

Date created: May 3, 2018

Western Cape Government
Agriculture