

Environmental Management Programme

Master Development Plan for Farm 1341 - Ground Truthing Exercise

Drakenstein Municipality

Project Number: 60539595
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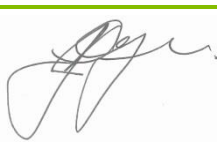
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Revision History

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This EMPr is developed solely for use during the ground truthing activities for the Master Development Plan – Farm 1431 Project, specifically; botanical, geotechnical, geohydrological, freshwater ecological, agricultural potential and heritage assessments.

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Terminology

Terminology	Explanation
Activity	Any action needed for the design, physical investigations and rehabilitation associated with the geotechnical and geological investigations.
Alien species	A species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities.
Environmental aspect	A product's or production process's environmental impact or important issues in the environment that an organisation should take into consideration.
Communication register	A register aimed at tracking all communication activities in the project.
Contaminated water	Water contaminated by pollutants from on-site or off-site activities;
Department of Water and Sanitation (DWS)	The authority responsible for water management.
Environment	The surroundings in which humans exist and which comprise: <ul style="list-style-type: none"> the land, water and atmosphere of the earth; micro-organisms and vegetation and animal life; any part or combination and interrelationships; and the physical, chemical, aesthetic, historical, cultural and economic properties and conditions of the foregoing that can influence human health and well-being.
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental Impact Assessment (EIA)	The process of collecting, organising, analysing, interpreting and communicating information in accordance with the environmental legal requirements set out in GNR. No 324, GNR. 325, GNR. 326 and GNR 327 as published in Government Gazette No. 40772 of 4 April 2017, promulgated in terms of Chapter 5 of the National Environmental Management Act, for the purposes of obtaining an Environmental Authorisation in accordance with Chapter 5 of the National Environmental Management Act.
Environmental Management Inspector	A person designated as an environmental management inspector in terms of Section 31B or 31C of the National Environmental Management Act.
Environmental Management Programme (EMPr)	A tool used to prescribe management mechanisms / methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development.
Fauna	All species of animals found in a particular region or environment.
Fire Protection Association	An association registered in terms of the National Veld and Forest Fire Act for the purposes of predicting, preventing, managing and extinguishing veld fires.
Fire hazard	The relative combination of fuel, oxygen and heat that will lead to the start and spread of a potential fire.
Flood line	The line or mark to which a flood could rise, every 50 (1:50 year flood line) or 100 (1:100 year flood line) years.
Flora	All species of vegetation found in a particular region or environment
Groundwater	The water that fills the natural openings in below-surface rock or unconsolidated sands.
Hazardous waste	Waste that, because of its <u>chemical</u> reactivity, toxic, <u>explosive</u> , corrosive, radioactive or other characteristics, causes danger or is likely to cause danger to <u>health</u> or the <u>environment</u> .
Heritage resources	Any place or object of cultural, archaeological or paleontological significance in terms of the National Heritage Resources Act, 1999.
Interested and Affected Parties (I&APs)	Any person, group of persons or organisation interested in or affected by such operation or activity and any organ of state that may have jurisdiction over any aspect

	of the operation of activity.
Land use	Characterised by the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it. The definition of land use in this way establishes a direct link between the land cover and the actions of people in their environment.
Materials	Items of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the contract.
Mitigate	The implementation of practical measures to reduce adverse impacts, or to enhance beneficial impacts, of an action.
No-go area	An area where physical investigation activities are prohibited.
Non-compliance	Failure to comply with the requirements of the EMPr.
Non-conformance Report	A report outlining a deviation from process, procedure or compliance specifications.
Plant	The apparatus, machinery and vehicles used for undertaking investigation work.
Pollution	Any change in the environment caused by substances and/or noise, malodours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, geotechnical and geological investigation and the provision of services, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or that will have such an effect in the future
Potentially hazardous substance	A substance that can have a deleterious effect on the environment. Hazardous chemical substances are defined in the Regulations for Hazardous Chemical Substances, published in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).
Precautionary Principle	The basic principle that, when in doubt or when there is insufficient or unreliable information, actions must be undertaken that have minimum risk.
Quality management system	A set of interrelated or interacting elements that organisations use to direct and control how quality policies are implemented and quality objectives are achieved.
Red Data	A program by the International Union for Conservation of Nature's (IUCN) for evaluating the conservation status of plant and animal species. This is represented as the Red List of Threatened Species.
Rehabilitation	To reinstate or restore to capacity or state similar or better than the state prior to investigations.
Sensitive receptors	Locations or areas that are likely to experience an impact greater than at other locations or areas; for example, schools and residential areas.
Solid waste	All solid waste, including waste generated through physical investigations, chemical waste, excess cement or concrete, wrapping materials, timber, steel, drums, wire, nails, food and domestic waste (e.g. food packaging).
Waste minimisation	The reduction of the volume of waste during the investigations by means of different processes or clean technology.
Waste prevention	The prevention and avoidance of the production of waste.
Wastewater	Water containing waste, or water that has been in contact with waste material.
Water resource	Includes a watercourse, surface water, estuary or aquifer.
Wetland	Means land, which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and which, in normal circumstances, supports or would support vegetation typically adapted to live in saturated soil (as defined in the National Water Act).
Works	Means the Permanent Works and the Temporary Works or either of them, as appropriate.

Acronyms

Acronym	Explanation
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FDI	Fire Danger Index
FPA	Fire Protection Association
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
NEMA	The National Environmental Management Act (Act 107 of 1998), as amended
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
PSP	Professional Service Provider
SAHRA	South African Heritage Resources Agency

1. Purpose and Scope of the EMPr

1.1 Introduction

An Environmental Management Programme (EMPr) can be defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced”. EMPrs are therefore important tools for ensuring that the management actions arising from Environmental Management processes are clearly defined and implemented through all phases of the project life-cycle.

The National Environmental Management Act (Act 107 of 1998), as amended, has a “duty of care” towards the environment and places an obligation on those responsible for environmental damage to pay the repair costs both to the biophysical and social environment and for the preventative measures to reduce or prevent pollution and environmental damage (the “polluter pays” principle).

1.2 Project Description

Drakenstein Municipality commissioned a review of the 2006 Cemetery Study in 2014. This study was finalized in June 2015 and identified the need for a 25 hectare (ha) site to serve the cemetery needs of the Drakenstein Municipal Area for the next 50 years.

The final study was approved by the Executive Mayor and Mayoral Committee on 19 August 2015. In the decision the Properties Section was tasked to engage with landowners of 7 sites – one of which was Farm 1341/ Paarl Division (known as Roggeland but also referred to as Dal Josafat Farm, extent 233 ha).

A letter dated 29 March 2016 from the South Africa Heritage Resources Agency (SAHRA) provided the municipality with provisional permission to go ahead with onsite ground truthing on Farm 1341/0 (subject to a successful permit application).

On 5 October 2016 SAHRA indicated that they would be open to proposals from the municipality to utilise the land for additional purposes but that a development potential plan would have to be provided to SAHRA in order for them to consider the proposed project favourably.

This project therefore endeavours to obtain the necessary permit from SAHRA, assess the character of the site through preliminary ground truthing assessments, namely:

- Geotechnical Assessment;
- Geohydrological Assessment;
- Heritage, Archaeological and Paleontological Assessment;
- Botanical Assessment;
- Agricultural Potential Assessment;
- Engineering Assessment; and
- Freshwater Ecological Assessment.

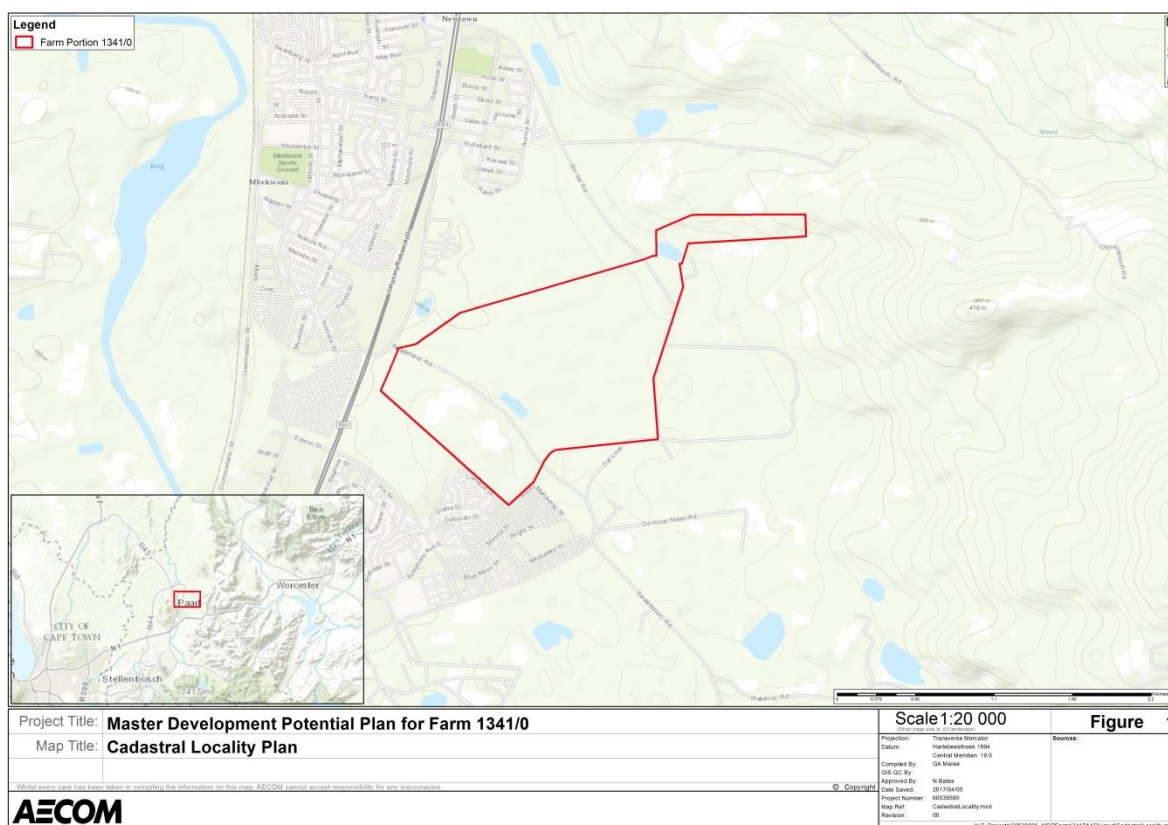


Figure 1: Location of Farm 1341/0

1.3 Purpose

The purpose of an EMPr is to provide an acceptable environmental framework and action plan to manage and control potential environmental impacts as a result of the ground truthing investigations. This EMPr is based on the principles of the NEMA. Such principles are:

- To avoid, minimise or correct the disturbance of ecosystems and loss of biodiversity;
- To avoid or minimise or correct pollution and degradation of the environment;
- To avoid or minimise waste and re-use or re-cycle waste where possible, disposing of it in a responsible manner;
- To apply a risk-averse and cautious approach; and
- To anticipate and to prevent negative impacts on the environment and on people’s environmental rights. Where they cannot be prevented, such impacts must be minimised and remedied.

The EMPr provides guidelines and directions to ensure that the proposed ground truthing investigations are undertaken in such a way as to avoid, where possible, impacts on the biophysical and social environment. The EMPr addresses the managerial and operational activities during and after investigations.

1.4 Nature of the EMPr

The EMPr is a legally required document to ensure that the Contractor complies with the requirements of reasonable protection of the environment as imposed by NEMA, in particular Section 28, which refers to duty of care. The EIA Regulations (2017) are used as a guideline for the content of the EMPr. The mitigation measures may include measures to:

- Inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed to avoid causing significant pollution or degradation of the environment;

- Cease, modify or control any act, activity or process causing the pollution or degradation;
- Contain or prevent the movement of pollutants or the cause of degradation;
- Eliminate any source of the pollution or degradation; or
- Remedy the effects of the pollution or degradation.

This EMPPr, as a standalone document, shall be used to guide and regulate environmental performance during geotechnical and geological investigations. It contains the following elements (also see **Section 3.4**):

- Goal setting and performance measurement;
- Compliance management;
- An assessment and management system;
- Community relations;
- Roles, responsibilities and accountabilities;
- risk management;
- Emergency preparedness and response; and
- Incident reporting and investigation.

2. Legal Framework

The project must be implemented within the framework of the NEMA and other relevant environmentally related legislation, including but not limited to the following national acts, provincial ordinances and/or guideline documents (Table 1).

Table 1: List of Applicable Legislation and Guidelines

Legislation	Sections	Relates to
The Constitution Act (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
	Section 25	Rights in property
	Section 32	Administrative justice
	Section 33	Access to information
National Environmental Management Act (No 107 of 1998), as amended	Section 2	Defines the strategic environmental management goals, principles and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	Duty of care and remediation of environmental damage. The scheme owner has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care. The duty of care has been amended to include significant pollution or degradation that occurred before the commencement of NEMA that arises or is likely to arise at a different time from the actual activity that caused the contamination or that arises through an act or activity of a person that results in a change to pre-existing contamination.
	Section 30	Control of emergency incidents. Responsible person's duties relating to reporting and remediation actions regarding emergency incidents. A criminal sanction may be imposed on the responsible person for failure to comply with the reporting requirements and obligations to address any emergency incidents.
Environment Conservation Act (No 73 of 1989) and regulations	The Act has been substantially repealed by NEMA. However, there are certain regulations under the Act which are still in operation such as the National Noise Control Regulations.	

Legislation	Sections	Relates to
National Environmental Management: Waste Act (No 59 of 2008) (NEMWA)	Section 16	General duty in respect of waste management
	Section 17	Reduction, re-use, recycling and recovery of waste
	Section 26	Prohibition of unauthorised disposal of waste.
	Section 27	Littering
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA)	Sections 65-69	These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species
	Sections 71 and 73	These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
	Section 35	Control of offensive odours
	Schedule 2	Ambient air quality standards
National Heritage Resources Act (No 25 of 1999)	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA), or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
	Section 38	This section provides for Heritage Impact Assessments (HIAs), which are not covered under the NEMA. The HIA will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA.
Occupational Health and Safety Act (No 85 of 1993) and regulations	General Administration Regulations GN R1449 (Section 7)	Material Safety Data Sheets must be made available at the request of any interested or affected person.
	Section 8	General duties of employers to their employees.
	Section 9	General duties of employers and self-employed persons to persons other than their employees.
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution of a water body.
	Section 20	Control of emergency incidents
	Chapter 4	Use of water and licensing.
Hazardous Substances Act (No 15 of 1973) and regulations		Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.
Minimum requirements for storage, handling and disposal of Hazardous Waste, DWAF	Section 10	Temporary hazardous waste storage: time, volume and other requirements.

Legislation	Sections	Relates to
guidelines, 1998		
National Road Traffic Act (No 93 of 1996) and regulations	Section 54	Transportation of dangerous goods.
National Veld and Forest Fires Act 101 of 1998	Chapter 2	Promotes and regulates the formation of fire protection associations which aim to manage and coordinate fire protection and fire services in an area.
	Chapter 4, 5	Organizations are required to make and maintain firebreaks and fire-fighting equipment and personnel should a risk exist that a fire may start or spread from the premises.
By-Laws	Relevant municipal by-laws	
DEA Integrated Environmental Management	DEA Integrated Environmental Management Information Series: Environmental Management Plans: DEA Guideline on compiling EMPs.	

3. EMPr Organisation, Responsibility and Authority

This section describes the key functionaries in the planning, implementation and monitoring of the EMPr. All communication between the various organisations must be in writing and must include the landowner, where appropriate and necessary.

3.1 Duties and Powers of the Developer

The Developer is ultimately responsible for:

- Commissioning the preparation, implementation and monitoring of the EMPr;
- Implementing and enforcing the EMPr during the planning, design, exploration, and de-commissioning stages;
- Ensuring compliance by all parties;
- Bearing the costs of the development and implementation of the EMPr; and
- Implementing corrective action where required.

3.2 Duties and Powers of the Project Manager

The Project Manager (AECOM) is ultimately responsible for:

- Preparing the initial EMPr;
- Ensuring that the EMPr has been included in the project documents;
- Appointing Contractor(s) that are reputable and sound, that can guarantee stable and loyal staff;
- Appointing Contractor(s) that preferably have previous environmental compliance experience;
- Assessing the Contractor's environmental performance during exploratory investigations; and
- Maintaining a register of complaints and queries made by members of the public.

3.3 Duties of the Contractor

All Contractors (including casual labour, subcontractors and staff) are ultimately responsible for:

- Taking photographs of the sites identified for exploration prior to the commencement of the Works;
- Adhering to any instructions issued by the Project Manager;
- Submitting incident reports to the Project Manager;

- Documenting the details of any communication between the Contractor and the public;
- Any complaints from interest groups (e.g. local farmers) regarding the appearance of the site must be promptly recorded and addressed by the Contractor;
- All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed and documented by the Contractor; and
- Maintaining a public complaints register.

The Contractor(s) must arrange for all his/her employees and those of his/her sub-contractors to be informed of the requirements of this EMPr.

Casual labour, sub-contractors and their employees must comply with all the requirements of this EMPr and supporting documents (for example, the contract document that applies to the Contractor) in terms of NEMA Section 28 Duty of Care. The absence of specific reference to casual labour or the sub-contractor in any specification does not imply that the casual labour or sub-contractor is not bound by this EMPr.

The Contractor shall clearly describe the overall methodology proposed for the geotechnical and geological investigations in particular method statements. All method statements must take environmental requirements into account.

3.4 Monitoring and Assessment of Compliance

The environmental management performance of the Contractor (including his/her sub-contractors and staff) will be reviewed by the Project Manager. The Contractor will be deemed not to have complied with the EMPr if:

- There is evidence of contravention of any of the clauses, both within and outside the boundaries of the exploration sites;
- The Contractor fails to comply with corrective or other instructions issued by the Project Manager within a time specified by the Project Manager; or
- The Contractor fails to respond adequately to complaints from the public.

4. Environmental Management during Investigation Planning

4.1 Setting Out and Survey

When determining the location of boreholes, test pits and trenches the Contractor shall take environmental considerations into account.

The Contractor shall take all steps necessary to protect existing survey pegs, reference pegs and bench marks and shall re-establish such at his own expense and to the satisfaction of the Project Manager should they be disturbed as a result of his activities on site.

5. Investigation Areas

5.1 Access to the Site and Investigation Areas

- The Contractor must use existing access roads to and on the site wherever possible.
- Deviation from the existing access roads must be planned, and should be limited to 4-5 m wide, to restrict undue disturbance of the environment including cropland, flora and fauna and their habitat as much as possible, and must have the approval of the Project Manager and the landowner. The deviations should consider the existing tracks before the opening of any new access roads.
- All route deviations must be approved by the Project Manager and must take into account mitigation measures contained within the EMPr.
- Cognisance is also to be taken of services above ground level, any known sub-surface and in particular overhead services where plant/equipment is transported onto site or moved between various investigation areas.

5.2 Safety and Security at the Sites

- Access to the geotechnical investigation sites must be restricted to prevent access by the general public.
- The geotechnical investigation sites must be secured to reduce opportunities for criminal activity whilst investigations are underway.
- Trenches and potential hazardous areas must be demarcated and clearly marked.
- No firearms, alcohol, drugs or smoking are allowed on site.
- Trespassing on the site as well as properties that adjoin the site is forbidden.
- No staff shall be permitted to remain overnight on site.

5.3 Training and Induction of Employees

The Contractor shall ensure that its employees and any third party who carries out all or part of the Contractor's obligations under the Contract are adequately trained with regard to the implementation of the EMP, as well as regarding environmental legal requirements and obligations.

5.4 Communications Register

Any complaints received will be investigated and a response will be given to the complainant within 7 days. Complaints received from the community must be recorded in the Communications Register. The complaint will be brought to the attention of the Project Manager, who will respond accordingly. Detailed information has to be recorded, including:

- The name and contact details of the complainant;
- The date, time and nature of the complaint;
- The response and investigation undertaken; and
- Which actions were taken to rectify the initial problem as well as to prevent a reoccurrence of the problem, together with the name of the person responsible for the action undertaken.

The Contractor shall assist the Project Manager in responding to queries and complaints from the public pertaining to investigation related activities by:

- Documenting the details of such communications and submitting the information to the Project Manager;
- Bringing any such matters to the attention of the Project Manager as soon they arise;
- Taking any remedial action as instructed by the Project Manager.

The Contractor shall make selected staff available for any formal consultation with affected parties for explaining the physical investigation process and answering such parties' questions.

5.5 Demarcated Areas and Fencing

All investigation activities shall be restricted to localities as approved by the Project Manager. Access to these localities shall be in accordance with those agreed to in **Section 5.1**.

5.6 Fire Risk and Burning

The Contractor shall supply fire-fighting equipment in proportion to the fire risk presented by the type of activities associated with physical investigations and other onsite activities and materials used on site.

No open fires will be permitted on site.

The Contractor shall ensure that the risk of fire at any location on the site is kept to a minimum. The Contractor shall comply with the requirements of the local Fire Protection Association.

5.7 Control of Damage to Vegetation and Animals

In principle, the ideal is to minimise damage to natural habitats. In practice, however, it is sometimes unavoidable, in which case the aim is to rehabilitate the disturbed land according to the EMP and the Project Managers instructions.

5.7.1 Destruction and Removal of Vegetation

No indigenous vegetation shall be removed by the Contractor, unless authorised by the Project Manager. Removal, damage, or disturbance of any vegetation outside the designated investigation areas is not permitted. Special care shall be taken not to disturb or destroy indigenous vegetation in excess of 1ha and any wetland vegetation (see **Section 5.7.3**).

Trees and tall woody shrubs must be protected from damage. Excavated material must not be placed on such vegetation and movement across them must not be allowed.

Trees protected in terms of the National Forests Act (Act 84 of 1998) shall not be cut, disturbed, damaged or destroyed, except under a license granted by the Minister of the Department of Agriculture, Forestry and Fisheries (DAFF).

5.7.2 Disturbance of Animals

No animals (birds, reptiles, amphibians, insects or mammals) that reside within or adjacent to the site shall be killed or unnecessarily disturbed.

Disturbances to birds' nesting sites must be minimised.

Where necessary, and to ensure that these animals are not harmed during the investigation activities, any area that will be negatively affected by physical investigations will be swept (by making a noise such as clapping hands) before any physical investigation activity to temporarily scare away these animals.

Should any animals be found during the sweeping process, the relevant conservation authority (either the Provincial Government, or the local Society for the Prevention of Cruelty to Animals (SPCA)) shall translocate sensitive species, where considered appropriate by the Project Manager.

5.7.3 Protection of Water Resources

No drilling or test pits will be carried out within a water resource or wetland area.

No drainage channels will be disturbed during the investigations.

No equipment or materials for investigations will be stored in any designated wetland or river area.

The Contractor shall not, in any way, modify or damage the banks or bed of a watercourse. Should damage occur, the Contractor will be held liable for any reparation and/or rehabilitation to the banks and beds of the watercourse and may be liable to prosecution in terms of the National Water Act (Act No. 36 of 1998).

5.8 Control of Damage to Topsoil

Where excavations will be taking place, topsoil (top 150 mm) shall be stripped from the investigation area and temporarily stockpiled, separately from (clay) subsoils and rocky materials excavated during investigations. When investigation areas are being reinstated, subsoil's and rocky materials are to be replaced first and covered with the stockpiled topsoil. The handling of topsoil and subsoils should be done so in such a manner as to prevent the generation of dust (see **Section 5.12.3**).

Soil must not be stockpiled on drainage lines or near watercourses.

5.9 Control of Pollution

As a minimum requirement, all waste emissions (hazardous, airborne, liquid and solid) from the site shall be kept within the limits of standards set in terms of relevant national and local pollution legislation and regulations.

5.9.1 General

No waste of a solid, liquid or gaseous nature shall be emitted from the site without approval from the Project Manager.

Precautionary measures must be taken to prevent any form of pollution.

Accidental pollution incidents shall be reported to the Project Manager immediately after they occur and shall be cleaned up by the Contractor or a nominated clean-up organisation at the expense of the Contractor.

5.9.2 Soil

Vehicle and plant maintenance shall be confined to the areas demarcated for this purpose. Should any amount of fuel, oil, transmission or hydraulic fluids be spilled onto the soils, the Project Manager shall be informed immediately. Tests must be conducted to determine the extent of soil contamination of the soil as soon as a spillage occurs. The polluted soil shall be rehabilitated or remediated to the satisfaction of the Project Manager.

Topsoil shall not be contaminated by any waste product.

5.9.3 Water

Pollution by any on-site or related activity shall be confined and cleaned up by the Contractor or a nominated clean-up organization at the expense of the Contractor. In terms of the National Water Act, a person in control of land or a person that occupies or uses the land on which any activity or process is or was performed or undertaken, or any other situation exists which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

Contaminated water shall be prevented from entering the surrounding environment either by seepage or natural flow.

5.9.4 Air

All reasonable measures should be taken to minimize air emissions in the form of smoke, gases and dust (see **Section 5.12.3**).

Waste must not be allowed to stand onsite to decay, as this would result in malodours.

No fires are permitted.

5.9.5 Sewage

Any spillage of sewage, either caused by the Contractor or any other party during the physical investigation activities, shall be cleaned up at the expense of the Contractor.

5.10 Management of Waste

In practice, all wastes arising from physical investigation activities are to be handled, transported and disposed of in accordance with the relevant regulations. All efforts shall be made to minimise, reclaim or recycle waste and, failing that, to dispose of it in a manner that is licensed by the Government for that purpose.

5.10.1 Sanitation

Ablution facilities shall be made available at a ratio of 1 toilet for every 15 employees. Ablution facilities shall be maintained on a daily basis. The Contractor shall ensure all waste is disposed of at an approved waste water treatment works.

The use of the surrounding veld as a toilet facility is not permitted under any circumstance.

5.10.2 Wastewater

Wastewater is water that is contaminated by humans through their actions.

Wastewater may not be disposed of directly or indirectly into the surrounding environment but should be collected and disposed appropriately, depending on the source of contamination.

5.10.3 Solid Waste

Solid waste generated during investigations shall be collected and removed by the Contractors and disposed of at an appropriate landfill. Wherever possible, recyclable waste shall be separated out of the solid waste and disposed of at an appropriate recycling facility. No waste shall be left at the investigation areas or anywhere on site after investigations have ceased.

5.10.4 Hazardous Wastes

Hazardous wastes are wastes that are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or as determined by the Hazardous Substances Act (Act 15 of 1973) as amended.

The discharge of hazardous chemicals (such as hydraulic fluid, degreaser etc), as declared under the Hazardous Substances Act as amended, on the site or into water resources is prohibited.

It is not envisaged that hazardous waste products will be on site except for those inside machinery which may be used during investigations/transport.

Hazardous waste products shall be disposed of at an appropriate waste disposal site.

5.11 Management of Storm Water and Soil Erosion

Investigation activities should be conducted in such a manner as to prevent damage to existing roads, along temporary roads and at investigation areas that could leave these areas vulnerable to soil erosion by storm water run-off. Erosion as a result of investigation activities shall be remediated by the Contractor.

Spill and wastes should be clean up immediately to prevent contamination of storm water should it rain during or after investigation activities have ceased. Should contamination of storm water occur, appropriate measures to contain and remove and dispose of this water should be taken.

Where contaminated stormwater has accumulated in test pits, spill socks should be used to soak up contaminated water and disposed of at an appropriate waste facility to prevent contamination of the surrounding environment. Any resulting contaminated soils should be removed and disposed of at an appropriate waste facility.

5.12 Control of Disturbance to Neighbours and/or Affected Residents

5.12.1 Scenic Quality

The Contractor shall position all temporary materials onsite in a neat and orderly fashion.

Clearing of the geotechnical investigation sites must be kept to a minimum and surrounding vegetation must, whenever possible, be left intact.

Excavated material must be backfilled after the test pits have been completed. No heaps of spoil material must be left on site once the Contractor has moved to a new investigation site.

5.12.2 Noise

All noise levels must be controlled at the source. All employees must be given the necessary ear protection. Noise emanating from site establishment and investigation activities must not be "disturbing noise"; that is, the sound level from the site measured at the nearest dwelling must not exceed the ambient noise level by 7dBA or more.

Silencer units on vehicles shall be maintained in good working order.

A speed restriction of 25km/h shall be imposed on all vehicles to limit additional noise that could be generated by these vehicles.

No loud music is allowed on site or at investigation areas.

5.12.3 Dust

The Contractor shall implement measures to restrict the generation of dust during geotechnical investigation related activities. Such measures could include avoiding dust generating activities during windy conditions, as appropriate.

5.12.4 Social Interaction and Disruption

The Contractor's activities and movement of staff shall be restricted to designated areas only. The Contractor and site staff may not interact directly with adjacent landowners but only through the Project Manager.

5.12.5 Traffic Control

All reasonable precautions must be taken during investigations to avoid severely interrupting the traffic flow on existing roads.

A maximum speed of 25km/h shall apply on the site.

5.13 Archaeology and Cultural Sites

All chance finds of human remains uncovered during physical excavations must be reported by the Project Manager to the nearest police station. Human remains may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).

Should a find of historical importance be unearthed during the investigations (chance find), all activities will stop at the site of discovery. The area will be fenced and demarcated as a 'no-go' area and access will be prohibited. The fence shall be placed at a distance of 20 m around the find. The Project Manager shall be notified immediately.

During this period, work will not take place in the demarcated area. Should the findings be limited to a particular area, the Project Manager, in consultation with the archaeologist, will determine what can reasonably be deemed a safe "no-work" buffer zone around the finding. Work can be continued outside of the safe no-work zone. The Contractor will be responsible for marking and fencing chance finds.

Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume in the affected area.

All known and identified archaeological and historical sites must be demarcated as "no-go" areas with a 20m buffer zone and left untouched.

5.14 Closing of Test Pits

Test pits shall be properly backfilled – the material excavated from the pit will be placed back in the reverse order that it was removed. Care shall be taken during the initial excavation to keep the topsoil separate from the other excavated material, and this shall be replaced on top at the end of backfilling.

6. Post Investigation Activities

6.1 Rehabilitation

Once investigations have been completed and the Contractor is due to leave the site:

- The existing access roads, temporary roads and test pits within agricultural lands must be left in a condition as agreed upon by the Project Manager prior to the commencement of activities on site.
- Temporary roads and test pits should be reinstated to their original state.
- Barriers and demarcations associated with the investigation phase must be removed (unless the Project Manager has stipulated otherwise); and
- The site is to be cleared of all litter and foreign materials.

6.2 Non-Compliance and Remedial Action

Throughout the contract, the Project Manager will monitor the ongoing EMPr conformance by the Contractor and sub-contractors. In any non-conformance report (“NCR”) the Project Manager will stipulate the recommended corrective action to be taken to remedy such non-conformance.

The Contractor is deemed not to have complied with the EMPr if, *inter alia*:

- There is evidence of contravention of the EMPr specifications within the boundaries of the site, site extensions and access roads.
- There is contravention of the EMPr specifications that relate to activities outside the boundaries of the site.
- Environmental damage ensues due to negligence.
- Contract activities take place outside the defined boundaries of the site.
- The Contractor fails to comply with corrective or other instructions issued by the Project Manager within a specific time period.
- Littering on-site.
- Lighting of illegal fires on-site.
- Persistent or un-repaired oil leaks.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on-site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to fauna, flora or cultural or heritage objects on-site
- Urination and defecation anywhere except in designated areas.

7. Conclusion

This EMPr has been compiled to ensure environmental impacts are avoided, mitigated or remediated and applies to the investigation phase, as well as the rehabilitation phase.

If the EMPr is effectively implemented and monitored, any negative environmental impacts of the project will be significantly reduced.

Appendix A : Environmental Checklist

To be completed by all Contractors undertaking investigations on site – and supplied to the Project Manager.

Activity	C	NC	N/A	Comments
Has the Contractor taken photographs of the site prior to commencement of the works?				
Has the Contractor received any complaints from interested and affected parties? If so were these recorded in a complaints register?				
Were any incidents recorded during the works on site? Were these reported to the Project Manager				
Were all employees informed of the requirements of the EMPr?				
Were environmental considerations taken into account before setting out of boreholes, test pits and trenches?				
Were existing access roads used? If not, were road deviations approved by the Project Manager?				
Were services above ground level, any known sub-surface and in particular overhead services taken into account prior to transporting equipment and vehicles on site?				
Were all excavations restricted, secured and clearly demarcated?				
Was firefighting equipment available on site?				
Was any indigenous vegetation destroyed during the site activities?				
Were any animals killed or unnecessarily disturbed?				
Were any water resources, wetlands or drainage channels impacted upon?				
Was topsoil stored separately and reinstated as it was removed?				
Did the Contractor dispose of all waste at a registered landfill site?				
Did the Contractor ensure that sufficient ablution facilities were available on site?				
Did the Contractor suitably manage the disturbance to neighbours or affected residents?				
Were any items of heritage significance discovered? Was the Project Manager notified?				
Was rehabilitation undertaken appropriately after conclusion of the works?				

**C – Compliant NC – Not Compliant N/A – Not applicable

Name: _____ Signature: _____ Date: _____

