

APPENDIX J
EMPr

**ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORT**

FOR

**Proposed expansion of a feedlot for cattle on Portion 4
of the farm Vlaknek 472JP, Ditsobotla Local
Municipality, North West Province**

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LIST OF ACRONYMS AND ABBREVIATIONS AND DEFINITIONS

AIS	Alien and Invasive Species Regulations (2014)
BPG	Best Practice Guidelines
BSP	Biodiversity Sector Plan (North West, 2015)
CARA	Conservation of Agriculture Resources Act, 1983 (Act 43 of 1983)
CBA	Critical Biodiversity Area (terrestrial and aquatic areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan)
CBD	Central Business District (centre of a town/city)
CRSA	Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) – Section 24 relates to environment
CSIR	Council for Scientific and Industrial Research
DLM	Ditsobotla Local Municipality
DWS	Department of Water and Sanitation (national authority responsible for water protection and implementation of NWA, custodian of South Africa's water resources)
EAP	Environmental Assessment Practitioner (independent consultant administering NEMA processes on behalf of applicant)
ECA	Environment Conservation Act, 1989 (Act 73 of 1989) – preceded NEMA
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment (process required in terms of NEMA to obtain authorisation for listed activities)
ELWU	Existing Lawful Water Use (under NWA, water uses undertaken two (2) years prior to promulgation of NWA)
EMP	Environmental Management Programme/Plan
ESA	Ecological Support Area (terrestrial and aquatic areas that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas; or in delivering ecosystem services.
GA	General Authorisation (authorised in terms of a GNR and therefore do not require licensing in terms of NWA)
GIS	Geographic Information System
GNR	Government Notice Regulation (notices published in Government Gazette in terms of already promulgated laws, legislated by government)
GNR 324	Listing 3 deals with activities requiring environmental authorisation due to sensitive locations
GNR 325	Listing 2 deals with activities requiring environmental authorisation due to expected higher environmental impact – requires full EIA (scoping and EIA)
GNR 326	EIA regulations – procedures / requirements

GNR 327	Listing 1 deals with activities requiring environmental authorisation due to expected lower environmental impact – requires Basic Assessment only
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IAIA	International Association of Impact Assessment
I&APs	Interested and Affected Parties (as identified during the Public Participation Process)
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
mamsl	Metres Above Mean Sea Level
Listed Activities	Activities identified in terms of NEMA Sections 24 and 24D which require environmental authorisation prior to commencement due to their potential environmental impacts. See GNR 324, 325, 326, 327
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998) – overarching environmental legislation in South Africa
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
NFEPA	National Freshwater Ecosystems Priority Area
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NMMDM	Ngaka Modiri Molema District Municipality
NWA	National Water Act, 1998 (Act 36 of 1998)
NWA S21	Section 21 of NWA identifying water uses
NW	North West (one of nine provinces in South Africa)
NW READ	North West Provincial Government: Department of Rural, Environment and Agricultural Development (Provincial authority responsible for environmental protection and implementation of NEMA)
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
PPP	Public Participation Process
QDGC	Quarter Degree Grid Cell
SACNASP	South African Council for Natural Scientific Professions (body for the registration of professional natural scientists)
SAHRA	South African Heritage Resources Agency (authority responsible for implementation of NHRA)
SAHRIS	South African Heritage Resources Information System (electronic system onto which reports are loaded for comments from SAHRA)
SANBI	South African National Biodiversity Institute

SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDP	Site Development Plan
SHEQ	Safety, Health, Environment & Quality
WISA	Water Institute of Southern Africa
WMA	Water Management Area (Nine (9) water management areas in South Africa – GNR1056 of 16 September 2016)
WML	Waste Management Licence
WUL	Water Use License
WULA	Water Use License Application

1 INTRODUCTION

HydroScience cc, an independent Environmental Assessment Practitioner (EAP), has been appointed by Fahari Property Investment (Pty) Ltd (Registration number 2000/020869/07), to undertake a Basic Assessment (BA) process and submit a Basic Assessment Report (BAR) to apply for environmental authorisation for the proposed expansion of a feedlot for cattle on Portion 4 of the farm Vlaknek 472JP, Ditsobotla Local Municipality (DLM), North West Province.

The BA process for this project has been designed to comply with the requirements of the Environmental Impact Assessment (EIA) Regulations of 4 December 2014 as amended on 7 April 2017 in terms of Section 24 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended which is South Africa's national framework environmental legislation. Key principles embodied in the NEMA include:

- Sustainability – development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs;
- Mitigation hierarchy – avoidance of environmental impacts, or where this is not possible, minimising the impact and remediating the impact; and
- The duty of care towards the environment.

The assessment of impacts has been conducted in accordance with these principles.

Based on the findings of the BA, an Environmental Management Programme (EMP) has been developed that will be implemented to control and minimise possible adverse impacts during all phases of the proposed project. The EMP will therefore:

- Define the various measures to be taken into account during the life of the project in order to enhance positive and minimise/reduce adverse environmental impacts and meet the performance specifications;
- Define the actions required to implement these measures;
- Describe how this will be achieved; and
- Allocate responsibilities for implementation.

EMPs are important tools for ensuring that the management actions/measures arising from the EIA process are clearly defined and implemented through all phases of the project.

The purpose of the EMP (this document) is to ensure the following:

- That unnecessary or reasonably avoidable adverse impacts of the project are prevented;
- That impacts which cannot be prevented are managed to reduce their significance; and
- That the positive benefits of the project are enhanced where possible.

2 LEGAL COMPLIANCE

Compliance of this EMP with the NEMA as amended, as per requirements in GNR 982 of 4 December 2014 as amended on 7 April 2017 (GNR 326) in terms of the EIA Regulations, Appendix 4.

Requirement in GNR 982, Appendix 4	Section in report where contained:
a) details of: <ul style="list-style-type: none"> i) EAP who prepared EMP; and ii) expertise of the EAP, including a curriculum vitae 	i) Paulette Jacobs from HydroScience ii) Refer to company profile and curriculum vitae in Appendix K. Registration with SACNASP, WISA and IAIA. Experience over 28 years.

Requirement in GNR 982, Appendix 4	Section in report where contained:
b) Detailed description of aspects of activity covered by EMP as identified by project description.	Sections 1 and 3 provide project description.
c) Map at an appropriate scale, superimposing proposed activity, its associated structures, and infrastructure on environmental sensitivities of preferred site, indicating areas to be avoided.	Appendices A and B contain all maps (A3 versions). Figure 1 in this report shows the regional locality and Figure 2 shows the location of the planned expansion on the property. The site is located within an Critical Biodiversity Area (CBA).
d) Description of impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through EIA process for all phases of development: <ul style="list-style-type: none"> i. Planning & design ii. Pre-construction iii. Construction iv. Rehabilitation post construction and post closure v. Operational 	Tables 2, 3, 4, 5 and 6 Section 7
e) Description and identification of impact management objectives and outcomes required for aspects contemplated in d) above.	Section 7 Table 6
f) Description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph d) and e) will be achieved.	Section 7 Table 6 Section 12
g) Method of monitoring implementation of impact management actions contemplated in f).	Section 8
h) Frequency of monitoring implementation of impact management actions contemplated in f).	Section 8
i) Indication of persons who will be responsible for implementation of impact management actions.	Section 9
j) Time periods within which impact management actions contemplated in f) must be implemented.	Section 7 Table 6
k) Mechanism for monitoring compliance with impact management actions contemplated in f).	Section 8

Requirement in GNR 982, Appendix 4	Section in report where contained:
l) Programme for reporting on compliance, taking into account requirements as prescribed by regulations.	Section 10 Section 12.6.10
m) Environmental awareness plan	Section 12
n) Any specific information that may be required by the competent authority.	None. Refer to appendices for specialist studies.

3 PROJECT

3.1 Project title

Proposed expansion of a feedlot for cattle on Portion 4 of the farm Vlaknek 472JP, Ditsobotla Local Municipality (DLM), North West Province.

3.2 Feedlot

A feedlot is a type of animal feeding operation, which is used in intensive animal farming for finishing livestock such as cattle, prior to slaughter. Refer to photographs in Appendix C.

3.3 NEMA listed activities relevant to the project

Expansion of feedlot: A small feedlot (300 - 500 cattle) currently exists on the property and the owner wants to expand the existing feedlot and operate it to accommodate 5 000 cattle (Government Notice Regulation (GNR) 983 of 4 December 2014 as amended in 2017 in GNR 327, Activity 39).

Clearance of vegetation: In order to expand the feedlot, an area of more than 300m² of indigenous vegetation will be cleared in an area classified as a CBA1 and Ecological Support Area (ESA) 1 in certain sections (GNR 985 of 4 December 2014 as amended in 2017 in GNR 324, Activity 12). Each head of cattle requires 10m², therefore the expansion will be ±45 000m² with 200 head of cattle / kraal.

3.4 Water supply and waste management

The borehole (25° 56' 07.1" South; 26° 35' 37.3" East), which supplies water to the farm and operations, is located west of the R53, 640m west of the feedlot expansion area. Cattle require 7 litres of water / head of cattle / day (12 775m³/annum requirement).

There are no wastewater dams and dry manure is used for fertilizing agricultural fields and donated for garden fertilizing (high demand). There are therefore limited quantities of manure on site at any point in time (refer to photographs in Appendix C).

3.5 Farm layout

The R53 cuts through the property and the portion of the property located to the west of the R53 is used for maize farming. The water supply borehole is also located west of the R53.

All other structures (buildings, accommodation, storage, etc) and operations, including the existing feedlot, are located east of the R53.

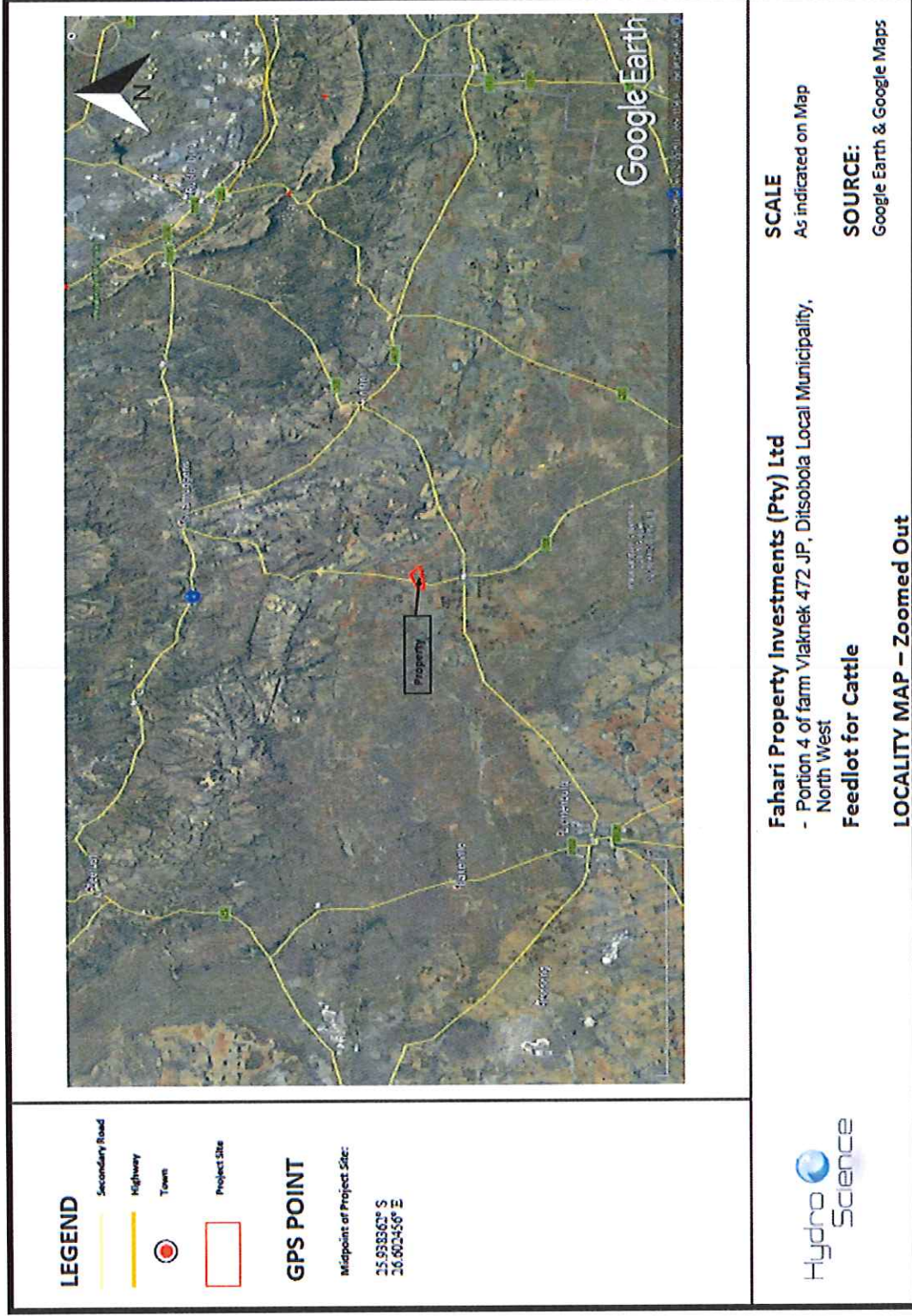


Figure 1: Regional locality map

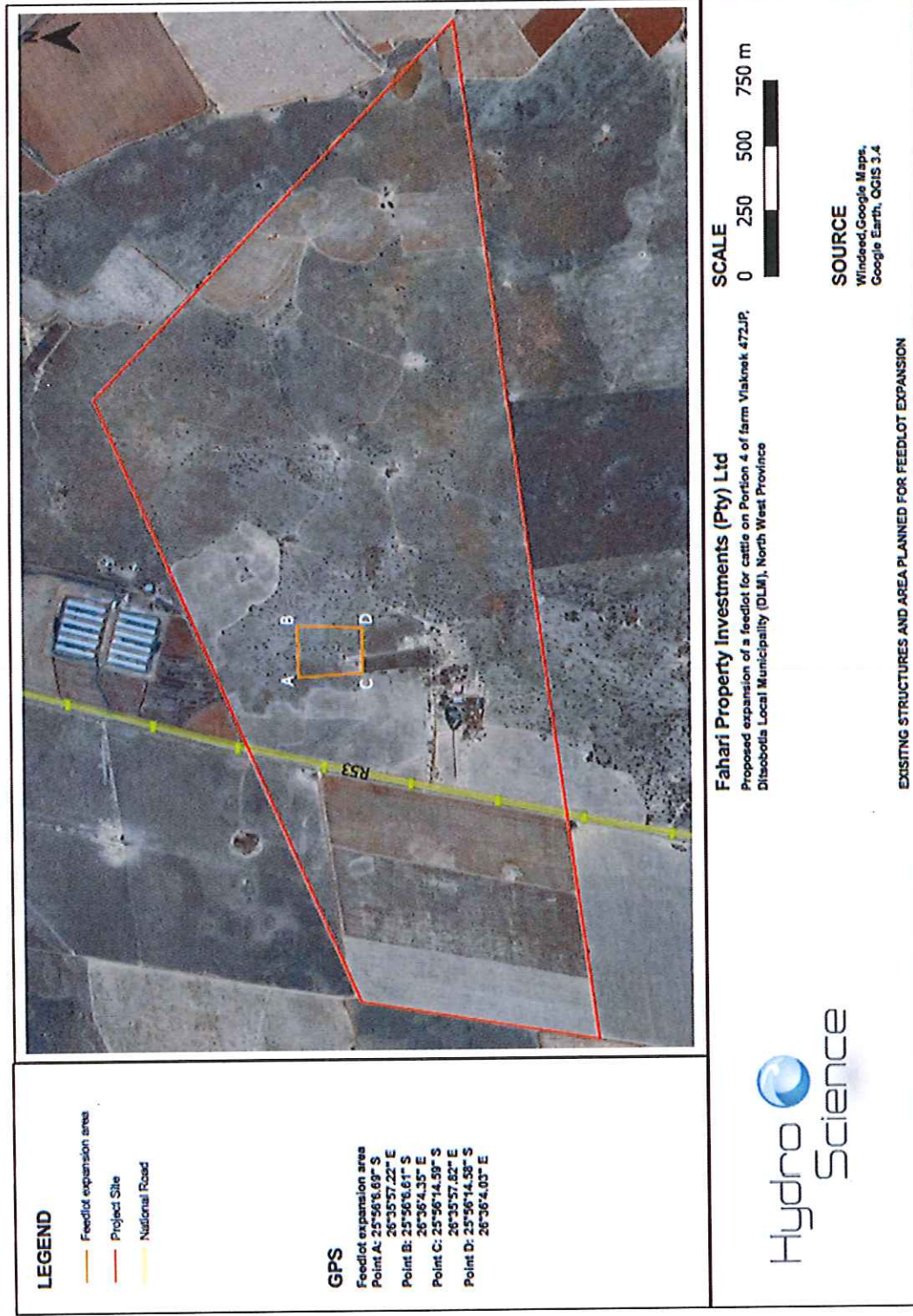


Figure 2: Existing structures and expansion locality on site

4 SPECIALIST STUDIES

4.1 Studies undertaken

The following specialist studies were undertaken as part of the project:

- Exemption from the Provincial Heritage Resources Agency (PHRA) in terms of the National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999).
- Ecology study by Iggdrasil Scientific Services, 2018 due to location in CBA1.
- Geohydrology study by Geo-logic Hydrogeological Consultants due to groundwater contamination risk as well as use of groundwater as water supply source.

4.2 Ecology summary

A biodiversity (fauna and flora) specialist study by Iggdrasil Scientific Services, found the following:

- Development/expansion area is located within CBA1 based on NW Biodiversity Sector Plan.
- Property is located within the Grassland Biome - Carletonville Dolomite Grassland (Gh15), which has a conservation status of *Vulnerable*.
- The conservation target for the Carletonville Dolomite Grassland is 24% with only a small extent currently protected and 23% considered to be transformed, mostly by cultivation (17%), urbanization (4%), forestry (1%) and mining (1%).
- Though indicated as being located within the Grassland Biome, the site was found to rather represent Savanna vegetation.
- Vegetation can be split into three (3) vegetation units namely: Savanna (*Ehretia rigida* - *Vachellia karroo* savannah), rocky grasslands and transformed areas.

According to the 2011 National List of Threatened Terrestrial Ecosystems for South Africa, the Carletonville Dolomite Grassland vegetation unit is not a listed threatened terrestrial ecosystem as per GNR 1002 (GG 34809 of 9 December 2011) published under the NEM:BA.

- Flora: No expected species of conservation concern (SCC) but there were however seven (7) species that were Not Evaluated (NE).
- Birds: Nine (9) SCC of which seven (7) are rated as having a very low likelihood of occurrence, and two (2) are rated as having a low likelihood of occurrence. Two (2) secretary birds (vulnerable) were found in an area adjacent to the development area. Other birds species found were common and abundant.
- Mammals: Eleven (17.4%) are listed as being SCC on a regional or global basis; five (5) are rated as having a low likelihood and six (6) as very low. The European fallow deer (*Dama dama*) is a Category 2 alien invasive species and requires a permit. No SCC were recorded during the survey and the relatively low mammal diversity was attributed to the transformed nature of the surrounding area, as well as the relatively high human density in the area.
- Reptiles: No SCC are expected and none were found.
- Amphibians: One (1) SCC, *Pyxicephalus adspersus* (Giant bullfrog) is listed as potentially occurring in the project area; likelihood of occurrence of this species was rated as low.

4.3 Geohydrology summary

A geohydrology specialist study by Geo-logic Hydrogeological Consultants, found the following:

- Drainage: Surface water drainage and groundwater drainage is to the south west.
- Water use versus requirements:
 - The hydrocensus indicated that groundwater is used for agricultural activities in the area (including irrigation) though not at a large scale.
 - Mean groundwater recharge in the area was taken as 65mm/annum or 11.8% of Mean Annual Precipitation (MAP). This equates to 726.58 m³/day.
 - 35m³/d water is required for the project based on 7 litres of water / head of cattle / day. This equates to 12 775m³/annum and is only 4.8% of the recharge. ***The groundwater use for the project is therefore sustainable and will not impact negatively on surrounding groundwater users in the farming community.***
- Contamination risk:
 - The vulnerability of the Groundwater Aquifer due to the Hydrogeological Conditions at the feedlot can be rated as Low risk.
 - The soil and silty sand on site have a medium percolation rate and will act as a filter system. The vertical travel of contaminated water will be at a rate of 2.44m/d.
 - The risk of pollution of the water source from organic or microbiological contaminants is low. The top layer has a high capacity to create an effective barrier to the movement of biological contaminants. A high reduction of bacteria and viruses will be evident in the unsaturated aquifer when infiltration to the lower soil layers does happen.
 - The sand on site has a minimal capacity to absorb chemical contaminants. Therefore nitrates (NO₃), phosphates (PO₄) and chlorides (Cl) will be minimally reduced.

Borehole 1 (BH1) is currently and will be used as the water supply source. The following is relevant to this borehole:

- Location: BH1 is located west of the R53 at GPS point: 25° 56' 07.1" South; 26° 35' 37.3" East with a ground elevation of 1 547 metres above mean sea level (mamsl).
- Depth: BH1 is 34.08 metres below ground level.
- Yield: BH1 is equipped with a small submersible pump delivering 1.4 litres/second. The recommended abstraction rate is 77.8m³/day. The requirement is only 45% of this abstraction rate.
- Distance from potential pollution sources: The borehole is 640m west of the feedlot.
- Water quality: Potable quality for parameters determined. Bacteriological parameters below detection. Electrical Conductivity (EC) of 23mS/m.

5 ENVIRONMENTAL IMPACT ASSESSMENT

5.1 Methodology

The significance of the environmental impacts identified was assessed in terms of their:

- Duration;
- Extent;
- Probability; and
- Severity.

The above were used to determine the significance of an impact without any mitigation, as well as with mitigation.

Nature of an impact: An impact's nature can be positive (+) or negative (-).

Consequence: Considers duration, extent and severity

Consequence = duration + extent + severity

Table 1: Environmental risk and impact assessment criteria.

DURATION (D)		
Immediate	Immediate - less than 1 month	1
Construction	Short term – construction phase (6 – 12 months)	2
Life of project	Medium term - operational phase	3
Post closure	Long term - time of rehabilitation and for re-establishment of natural systems	4
Residual	A permanent impact (100 years or more)	5
EXTENT (E)		
Site specific	Site of the proposed feedlot (45 000m ² on Portion 4 of the farm Vlaknek)	1
Local	Site and surrounding sites (Portion 4 of the farm Vlaknek and surrounding farms)	2
Regional	Ditsobotla Local Municipality (DLM)	3
Provincial	North West Province	4
National	Republic of South Africa	5
PROBABILITY (P)		
Rare	< 5% probability of occurrence – may occur in exceptional circumstances	1
Unlikely	15% - 6% probability of occurrence – could occur at some time	2
Possible	45% - 16% chance of occurrence – might occur at some time	3
Likely	65% - 46% probability of occurrence – will probably occur in most circumstances (medium)	4
Almost Certain	66% - 99% probability of occurrence – is expected to occur – highly probable	5
Definite	100% - will occur	6
SEVERITY (S)		
Catastrophic (critical)	Total change in area of direct impact, relocation not an option, death, toxic release off-site with detrimental effects, irreversible loss, huge financial loss	6
Significant (High)	> 70% change in area of direct impact due to loss of significant aspect, extensive injuries, long term loss in capabilities, off-site release to high extent, major financial implications	5
Serious	50 – 70% long term loss, extensive rehabilitation / restoration / treatment required, high financial impact, still restricted in extent	4
Moderate (medium)	20 – 49% change, medium term loss in capabilities, rehabilitation / restoration / treatment required, on-site release with outside assistance, medium financial impact	3
Minor	10 – 19% change, short term impact that can be absorbed, on-site release, immediate containment, low financial implications	2
Insignificant (low)	< 10 % change in the area of impact, no financial implications, localised impact, a small percentage of population	1

[Duration (D) + Extent (E) + Severity (S)] x Probability (P) = Impact Significance (IS)

IMPACT SIGNIFICANCE (IS)		
Impact Significance	IS score range	Description
Low (L)	<15	The impact is minor or insubstantial; it is of little importance to any stakeholder and can easily be rectified.
Moderate Low (ML)	16 - 45	The impact is limited in extent, even if the intensity is major; the probability will only be likely, the impact will not have a significant impact considered in relation to the bigger picture; no major material effect on decisions and will require only small scale management intervention bearing moderate costs.
Moderate high (MH)	46 - 70	The impact is significant to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High (H)	71 <	The impact could render development options controversial or the entire project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in project decision-making.

5.2 Impact Assessment Ratings

The impacts and associated significance ratings for each phase of the project were assessed (Tables 2, 3, 4 and 5 below). The no-go option would not meet the need for food production.

Table 2: Impact significance for the construction phase

Aspect and description		Impact rating (before mitigation)							Impact Rating (after mitigation)						
Aspect	Description	Nature of Impact - Positive / Negative	Spatial Scale / Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)	Nature of Impact (positive / Negative)	Spatial Scale / Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)
Topography and Aesthetics	No impact: Expansion of 4.5ha on a 408ha farm (1% of surface area) already used for agricultural purposes in an agricultural area. Relatively flat area. Refer to photographs – visibility from road (R53).														
Geology and Soil	No impact: Soil erosion due to overgrazing not possible due to supply of feed within a feedlot														
Biodiversity Fauna & flora	Loss of faunal habitat	N	1	5	2	8	2	16	N	1	5	1	7	2	14
	Loss of foral species and floral habitat	N	1	5	2	8	2	16	N	1	5	1	7	2	14
	Increase in invasive plant species	N	2	5	3	10	4	40	N	1	1	2	4	2	8
	Loss of critical biodiversity habitat	N	2	5	3	10	3	30	N	1	5	1	7	3	21
Land Use	No impact: The expansion area is located on an existing farm within an agricultural area.														
Socio-economic	Job creation								POSITIVE						
Waste Management	Handling & Disposal of Construction Waste	N	1	2	1	4	2	8	N	1	2	1	4	1	4
Soil, Surface Water and Groundwater	Pollution	N	1	2	3	4	2	8	N	1	2	1	4	1	4

Table 3: Impact significance for the operational phase

Aspect and description		Impact rating (before mitigation)						Impact Rating (after mitigation)							
Aspect	Description	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	Significance (96)	Nature of Impact (positive / Negative)	Spatial Scale/ Extent (6)	Duration (6)	Severity (6)	Consequence	Probability (6)	Significance (96)
Biodiversity Fauna & flora	Loss of faunal habitat	N	2	5	2	9	3	27	N	1	5	1	7	2	14
	Loss of foral species and floral habitat	N	2	5	2	9	3	27	N	1	5	1	7	2	14
	Increase in invasive plant species	N	2	5	2	9	3	27	N	1	5	1	7	2	14
	Loss of critical biodiversity habitat	N	2	5	3	10	3	30	N	1	5	1	7	3	21
Socio-economic	Job creation	POSITIVE						POSITIVE							
	Food production	POSITIVE						POSITIVE							
	Local economic development	POSITIVE						POSITIVE							
Air quality and waste management	Methane gas due to manure accumulation	N	2	5	3	10	3	30	N	2	5	1	8	1	8
	Chemical Pollution - nitrogen & phosphorus	N	2	5	2	9	4	32	N	2	5	1	8	1	8
Soil and Water	Bacteriological Pollution	N	2	5	1	8	2	16	N	2	5	1	8	1	8
	Reduction due to overabstraction	N	3	5	3	11	3	33	N	3	5	2	10	2	12

Table 4: Impact significance for the decommissioning phase

Not applicable to this project and if decommissioned, the area will be used for another agricultural activity or return to natural.

Table 5: Impact and associated significance for the No-go Option

Aspect and description		Impact rating (before mitigation)						Significance (98)
Aspect	Description	Nature of Impact - Positive / Negative	Spatial Scale / Extent (5)	Duration (5)	Severity (6)	Consequence	Probability (6)	
Socio-economic	No additional jobs. No financial gain. Not meeting food production need.	N	4	4	3	11	6	66
Biodiversity	No disturbance to existing biodiversity							
POSITIVE								

6 POTENTIAL IMPACTS

Based on the identified impacts and associated significance ratings provided above, the following potential (negative and positive) impacts have been identified as being key to the two (2) phases for the proposed project:

6.1 Potentially negative impacts

Construction phase (Short term):

- Biodiversity due to location in a CBA1 according to NW Biodiversity Sector Plan.
- Waste management (construction and people)
- Soil, Surface Water and Groundwater pollution due to construction activities - minimal construction activities due to existing structures and nature of project (feedlot).

Operational phase (indefinitely):

- Biodiversity due to loss of natural vegetation and habitat and establishment of alien invasive species.
- Waste management and air quality due intense farming and manure production (methane gas).
- Soil, Surface Water and Groundwater pollution due to bacteriological and chemical pollution as a result of cattle excretions. Specifically groundwater quality.
- Groundwater availability due to abstraction of groundwater for use and the fact that groundwater is the only available water supply source in the area (no municipal services) and the abstraction can impact on other water users.

6.2 Positive impacts

Construction phase:

- Job creation.

Operational phase:

Positive impacts will occur as part of the operational phase and include the following socio-economic benefits:

- Job creation since more ten (10) more people will be employed due to the expansion.
- Food production due to the increase in the number of cattle (> 4 500 cattle) being fed and prepared for slaughtering and meat production in the abattoir in Koster.
- Local economic development due to job creation and investment (R20 million) in the development of the area for more intense farming.

Due to the fact that the results are positive, no mitigation will be required.

6.3 No-go Option impacts

The aspects below are impacted upon if the No-go option should be administered. Mitigation for these impacts includes the continuation of the proposed project.

Negative:

- Socio-economic in terms of job creation, food production and local economic development.

Positive:

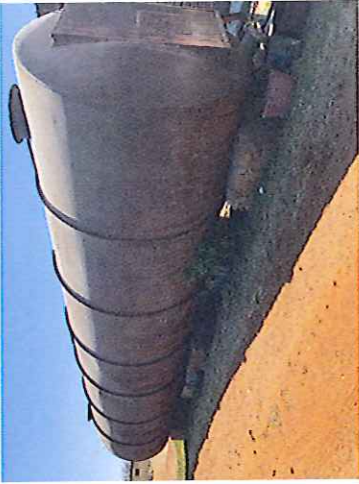


- Biodiversity since the area will be left undisturbed.

7 MANAGEMENT MEASURES

Dedicated management measures have been identified to manage the above identified impacts (Table 6). The purpose of the EMP is to ensure that undue or reasonably avoidable adverse impacts of the project are prevented, that impacts which cannot be prevented are managed to reduce their significance and that the positive benefits of the project are enhanced.

Table 6: Identified potential impacts and proposed management measures

Construction / installation phase (6 - 12 months)	
Biodiversity	
Potential impacts:	<ul style="list-style-type: none"> • Loss of faunal habitat. • Loss of foral species and floral habitat (especially to the east of the expansion area). • Increase in invasive plant species. • Loss of critical biodiversity habitat (CBA1).
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> • No harming, trapping, capturing or poaching of fauna species encountered. If any faunal species including snakes or scorpions are encountered during site clearing, relocate these to the surrounding (buffer) area. • Limit activities and clearance of vegetation to the extent of the expansion area (project footprint) to limit disturbances to surrounding areas (wildlife habitat). Communicate all no-go areas. • Plan roads in transformed area to limit fragmentation within the landscape and additional loss of vegetative cover. • Keep area to the east of the feedlot expansion area intact to maintain the remaining corridor. • Minimise the removal of large indigenous trees in the feedlot area to provide shade to the cattle. • Minimise the removal of large indigenous trees, shrubs and understorey vegetation are far as practically possible in the area surrounding the feedlot. • Undertake an alien invasive vegetation eradication programme and clear all alien invasive vegetation species, in particular Category 1b species identified during the specialist investigation, from the property as required by legislation. Implement this immediately as it takes at least three (3) years to break the cycle of regeneration (remove seedling & saplings, prevent spread of seeds). • Vehicles and equipment as well as construction material to be free from plant material. • Discard faecal matter and remaining feed in transformed areas such as existing pastures and agricultural fields. • Appoint an Environmental Control Officer (ECO) to ensure mitigation measures are implemented.
Impact Significance : (Post mitigation)	Low

Waste Management	
<p>Potential impact:</p>	<p>Handling and Disposal of Waste</p> <p>Poor solid waste management practises can lead to contamination (soil and water) and unsightly areas as well as pests/vermin and odours with associated health issues. Waste streams include:</p> <ul style="list-style-type: none"> • Solid construction waste generated through building activities (minimal). • Biodegradable waste due to vegetation clearance, food waste, excretions. • Hazardous waste in the event of a spillage/leak (equipment or vehicles). • General waste produced by workers (biodegradable and non-biodegradable).
<p>Impact Significance: (Prior to mitigation)</p> <p>Management Measures:</p>	<p style="text-align: center;">Low</p> <ul style="list-style-type: none"> • Prevention of waste: Storage– Storage areas should be safe, secure and weatherproof to prevent damage, resulting in waste generation. <div style="display: flex; justify-content: space-around;">    </div> <p>Feed storage to prevent waste due to spoil feed – spoiled storage shed (left); covered with plastic (middle); molasses tank (right)</p> <ul style="list-style-type: none"> • Reduction / minimisation of waste: Reduce waste quantities and disposal costs through a reduction in the materials ordered. “Take-back” schemes – setting up schemes with suppliers to take back surplus materials. Collect waste in suitable containers (drums/skips/bins on site). Engage with the supply chain to supply products and materials that use minimal packaging.

	<ul style="list-style-type: none"> • Reuse / recycling of waste: Separate / sort waste for recycling. Manure generated in the feedlot by the cattle will be removed, stored next to the storage building and then removed and reused in agricultural fields or donated to households as garden fertiliser. • Waste handling on site: <ul style="list-style-type: none"> ○ Separate / sort waste. ○ Waste containers must have covers to prevent rainwater infiltration. ○ Ensure sufficient containers are available for storage of waste prior to removal off site to prevent overflow and littering on the site and surroundings. ○ Ensure no litter, refuse, waste and rubble generated on the premises be placed, dumped or deposited on this farm, adjacent or surrounding properties. ○ Arrange litter patrols to collect and remove windblown litter. ○ Manure to be stored in a dedicated area next to (north of) the storage building. • Waste removal & disposal: <ul style="list-style-type: none"> ○ Remove manure and reuse in agricultural fields or donate to households as garden fertiliser. ○ Remove other waste from site for disposal to the local licensed municipal landfill / waste management facility on a regular basis. Responsibility of owner. • Documentation: <ul style="list-style-type: none"> ○ Report on the quantities of different waste streams managed (landfill, reuse, recycling, energy recovery). ○ Ensure copies of all waste manifests (safe disposal certificates) are kept, showing responsible handling, transport and disposal.
<p>Impact Significance : (Post mitigation)</p>	<p style="text-align: center;">Low</p>

Soil, Surface Water and Groundwater	
Potential impact:	<p>Pollution due to:</p> <ul style="list-style-type: none"> • Incorrect handling of waste (see above). • Incorrect handling of spillages (concrete and hydrocarbons).
Impact Significance: (Prior to mitigation)	Low
Management Measures:	<ul style="list-style-type: none"> • Refer to waste management section above. • Ensure that all materials are effectively stored and managed to prevent contamination. • Vehicles / equipment / machinery maintenance should be undertaken in the workshop if it is emergency repairs in which case drip trays and absorbent material should be used to capture and contain hydrocarbon spillages. • Planned maintenance should be conducted off-site. • In the unlikely event of a spillage, sufficient clean-up procedures must be carried out immediately. • > 500m between potential pollution sources and water supply borehole. • Groundwater monitoring to detect impacts and take remedial action.
Impact Significance : (Post mitigation)	Low

Operational phase (indefinite)	
Biodiversity	
Potential impact:	<ul style="list-style-type: none"> • Loss of faunal habitat. • Loss of foral species and floral habitat (especially to the east of the expansion area). • Increase in invasive plant species. • Loss of critical biodiversity habitat (CBA1).
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	As per construction phase.
Impact Significance : (Post mitigation)	Low
Air Quality and Waste Management	
Potential impact:	<p>Handling and Disposal of Waste</p> <p>Poor solid waste management practises can lead to contamination (soil and water) and unsightly areas as well as pests/vermin and odours with associated health issues. Waste streams include:</p> <ul style="list-style-type: none"> • Solid construction waste generated through building activities (minimal). • Biodegradable waste due to vegetation clearance, food waste, excretions (methane gas). • Hazardous waste in the event of a spillage/leak (equipment or vehicles). • General waste produced by workers (biodegradable and non-biodegradable).
Impact Significance: (Prior to mitigation)	Low
Management Measures:	As per construction phase.
Impact Significance : (Post mitigation)	Low

Soil, Surface Water and Groundwater	
Potential impact:	<p>Pollution due to:</p> <ul style="list-style-type: none"> • Incorrect handling of waste (see above). • Incorrect handling of spillages (concrete and hydrocarbons). <p>Contamination of soil and surface water (rain water and runoff) can result in groundwater contamination.</p>
Impact Significance: (Prior to mitigation)	Low
Management Measures:	<ul style="list-style-type: none"> • As per construction phase. • Medium percolation rate (2.44m/d) of soil and silty sand act as a filter system to potential contamination to the groundwater aquifer. • The top soil layer further has a high capacity to create an effective barrier to the movement of biological contaminants further reducing the risk of organic or microbiological contamination of the groundwater aquifer. • The sand however has a minimal capacity to absorb chemical contaminants (nitrates (NO₃) and phosphates (PO₄)). • Analyze groundwater sample bi-annually.
Impact Significance : (Post mitigation)	Low
Potential impact:	Reduction in groundwater availability to all water users in the catchment area due to overabstraction by this operation.
Impact Significance: (Prior to mitigation)	Moderate Low
Management Measures:	<ul style="list-style-type: none"> • Requirement (35m³/day) is only 4.8% of the recharge (726.58 m³/day) • Requirement (35m³/day) is only 45% of the recommended abstraction rate (77.8m³/day). • Measure abstraction volumes.
Impact Significance : (Post mitigation)	Low

8 MONITORING PROGRAMME

Monitoring and auditing of compliance with this EMP, the environmental authorisation conditions, the Water Use License (WUL) conditions and with the Occupational Health and Safety Act (OHSA) Regulations are to be conducted. An Audit Protocol has to be drawn up by a suitably qualified person to include but not be limited to aspects listed below.

Environmental compliance:

- Appoint an ECO to check compliance with EMP, environmental authorisation and WUL conditions.

OHSA Compliance:

- A register to indicate that all the employees have been informed as to their rights under the Act; and
- Accident records to be kept, as per the Act and reported to the Department of Trade and Industry (DTI).

Complaints and incident register:

- Register all complaints and incidents as well as measures taken to address these.

Water monitoring:

- Quantity: Measure water volume abstracted from BH1.
- Sampling frequency: Sample BH1 biannually in the dry and wet season.
- Quality: Have water samples analysed for chemical and bacteriological parameters.
 - Physical parameters: pH and Electrical Conductivity (EC).
 - Bacteriological parameters: E.coli and Total Coliform.
 - Chemical parameters: TDS, Calcium (Ca), Magnesium (Mg), Sodium (Na), Potassium (K), Sulphate (SO₄), Chloride (Cl), Nitrate (NO₃ as N), ortho-Phosphate (o-PO₄), Fluoride (F), Ammonium (NH₄ as N).
- Quality control and assurance: Include blanks, standards, duplicates, cation-anion balances etc. to allow data verification and validation.

9 RESPONSIBILITY

The applicant, Fahari Property Investment (Pty) Ltd, will be responsible for the implementation of all management measures as well as for compliance with this EMP and any additional conditions imposed by the environmental authorisation and WUL. Each Contractor or employee involved in the project will comply with the EMP and environmental authorisation conditions and Contractors will therefore appoint a Contractor's Representative (the title may vary), who is responsible for the on-site implementation of the EMP (or relevant sections of the EMP).

The applicant's representative (farm manager) and contractor's representative will be suitably qualified to perform the necessary tasks and will be appointed at a level such that he/she can interact effectively with other site contractors, labourers, the ECO, and the public. The representative must ensure that all sub-contractors abide by the requirements of the EMP, the environmental authorisation conditions and WUL conditions.

The representative for Fahari Property Investment (Pty) Ltd is Mr Martiens de Jager (083 306 3304) and his details are displayed at the entrance gate.

The management measures of the EMP and the conditions of the environmental authorisation and WUL must be brought to the attention of all persons (employees, workers,

consultants, contractors etc.) associated with the undertaking of the project. Fahari Property Investment (Pty) Ltd must take such measures that are necessary to bind such persons to the conditions thereof (contracts).

Fahari Property Investment (Pty) Ltd can further enforce this by running workshops with all employees in order to raise environmental awareness (refer to environmental awareness plan). These workshops should cover aspects such as the handling of used hydrocarbons (grease & oil), pollution prevention, water conservation, waste management and general duty of care.

10 RECORD KEEPING AND REPORTING

Accurate and up-to-date records will be kept of all system malfunctions resulting in non-compliance with the EMP or authorisations or licences. Fahari Property Investment (Pty) Ltd will also, within 24 hours, ensure that the relevant authorities are notified of the occurrence or detection of any incident which has the potential to cause, or has caused pollution of the environment, health risks or which is a contravention of any EMP or environmental authorisation or licence condition. Fahari Property Investment (Pty) Ltd is then to submit an action plan indicating measures which will be taken to:

- Correct the impacts resulting from the incident;
- Prevent the incident from causing any further impact; and
- Prevent a recurrence of a similar incident.

A complaints register will be kept on site and all complaints from the public and neighbours will be noted therein as well as measures taken to rectify the situation as described above.

11 ALTERATIONS TO THE EMP

As EMPs should remain dynamic and flexible, certain conditions may require the EMP to be revised. These conditions may include the following:

- Changes in legislation;
- Published/gazetted norms and standards;
- Occurrence of unanticipated impacts or impacts of greater significance, intensity and extent than anticipated;
- Conditions in environmental authorisation or water use license which do not form part of the EMP;
- Inadequate mitigation measures, i.e. where the level of an environmental parameter is not conforming to the required level despite the implementation of the mitigation measure; and
- Secondary impacts which occur as a result of the mitigation measures.

12 ENVIRONMENTAL AWARENESS PLAN

12.1 Objectives

The objectives of an environmental awareness plan are to:

- Inform employees and contractors of any environmental risk which may result from their work, and
- Inform employees and contractors of the manner in which the identified possible risks must be dealt with in order to avoid pollution or degradation of the environment.

In general, the purpose of implementing an environmental awareness plan is to optimise the awareness of those partaking in the activities, which have the potential to impact negatively on the environment, and in doing so, promote the goal of sustainable development.

12.2 Communication

Both objectives of the environmental awareness plan indicate that employees and contractors must be informed. Information sharing is only possible through effective communication channels.

The goal for proficient communication is to provide structures for effective communication, participation and consultation that relate to occupational health and safety hazards, environmental hazards and the Safety, Health, Environment and Quality (SHEQ) management system.

The objective of the communication procedure is to ensure effective communication flow, involvement of all levels of employees in the communication chain and to comply with the requirements in terms of ISO 9001:2008 clause 5.5.3 and ISO 14001:2004 clause 4.4.3.

12.3 Communication responsibility

Communication on site will be uncomplicated due to the limited number of people involved.

The owner representative, Mr Martiens de Jager, has the responsibility, designated authority and accountability to ensure:

- Communication channels/processes are established, implemented and maintained.
- External communication: Communication with the media (press releases), other governmental departments (Department of Labour, Department of Agriculture etc.), provincial (NW READ) and local authorities (DLM & NMMDM) as well as Interested and Affected Parties (I&APs such as neighbouring farmers) on environmental issues.
- Internal communication:
 - Informing employees as to who is their representative and designated management appointee.
 - Obtaining information relating to responses required and/or requested by external parties from on-site representatives.
- Amendments to or new legislation, amendments to or new policies, amendments to or new procedures and protocols.
- Development and review of environmental policies and management of hazards/risks/impacts.

Employees and farm manager (on-site representatives/workers) have the responsibility to conduct themselves in a circumspect manner ensuring the environment is not negatively impacted by their activities and their actions do not negatively impact the company image.

12.4 Environmental risk

Employees and contractors will be informed of any environmental risk, which may result from their work through the communication channels established and described above. Employees and contractors will be informed of environmental risks through communication from management and documentation provided. Environmental principles will be communicated effectively to newly appointed employees, current employees, employees returning from leave as well as contractors and visitors upon entering the area.

Work procedures and protocols, which include potential risks, will be compiled for all tasks to be undertaken. Within each work procedure, an environmental risk section will be included. The environmental risk section will indicate whether the risk is to air, groundwater, surface water, soil, fauna or flora. The work procedure will then also include actions to be taken by the employee to prevent or minimise the risk.

12.5 General considerations

It is important to consider the level of education and literacy of the receiving audience and all information communicated should therefore be kept simple and be easy to understand, making use of pictures as much as is practically possible to also overcome possible language barriers in English documentation.

Employees, personnel, staff, workers and contractors on the project need to be equipped with the knowledge, skills and training to enable them to manage their task competently and safely without significant impact on their surrounding environment. Mr Martiens de Jager will ensure that he employs people qualified for the task which is expected of them and/or provide in-house training to acceptable skill levels.

While Mr Martiens de Jager will ultimately be responsible and accountable, workers will also be given responsibility and accountability to follow procedures and report to management on certain aspects.

Basic environmental knowledge, training and awareness will be communicated.

12.6 Aspects covered

The first objective of the environmental awareness plan is to inform employees and contractors of any environmental risk which may result from their work. The following aspects will be addressed during environmental awareness training for employees, personnel, staff, workers, contractors and visitors. The objective is to raise environmental awareness and educate people on environmentally responsible conduct.

The items have been structured to enable even uneducated visitors to comprehend it. Pictures will be added to convey the message to illiterate people. Notices / sign boards can be placed around the site to continually remind workers to be environmentally responsible and cautious.

12.6.1 General

Importance of the environment and why we need to protect it.

- Non-living elements: air, water, soil.
- Living elements: plants, animals, humans.
- Living elements depend on non-living elements for survival.
- Relationship between living and non-living elements.
- The life cycle to keep everything in balance.
- People are reliant on the natural life cycle for their existence.

Terminology

- Any change to the environment due to human activities is called an impact. Impacts can be positive or negative. A positive impact is job creation. A negative impact is pollution such as littering and improper waste handling.
- Contamination or pollution is when a natural element such as water is impacted negatively due to human activities – pollution of water.
- Environmental management is the control of human activities to minimise the impact on the natural environment as much as possible. It ensures that pollution is minimised and that people living in the environment are healthy (physically and mentally). The collection, storage and off-site removal of waste is an environmental management measure.

The role of the employee.

- What can you and I do to protect the environment? Discuss environmentally acceptable behaviour such as closing of taps, correct use of ablution facilities, no littering etc.
- What can you and I do to ensure that this project does not cause unnecessary damage to the environment? Remain within demarcated areas, water conservation etc.
- There is always a reason for an environmental impact or accident and generally people are the reason.
- Always work carefully so that you don't damage the environment and protect your own safety and health.
- Obey the rules.
- Report any impacts/incidents or accidents to your supervisor/manager.
- Your role is important, be environmentally responsible and always aware of the environment.
- Negative environmental impacts can cause death, injury, pain, suffering, diseases, damage to property and equipment, legal liability, cost, loss of productivity.
- We must look after our environment for the sake of our children and their children.

South African laws protecting the environment:

- Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) – Section 24.
- National Water Act, 1998 (Act 36 of 1998)
- National Environmental Management Act, 1998 (Act 107 of 1998)
- National Environmental Management Waste Act, 2008 (Act 59 of 2008)
- National Environmental Management Air Quality Act, 2004 (Act 39 of 2004)

12.6.2 Animals

- No hunting, poaching, snaring or killing of any wild animals will be allowed.

12.6.3 Plants

- Vegetation will only be removed within the demarcated footprint for the feedlot.
- Maintain large indigenous trees in the feedlot footprint area to provide shade for cattle.
- Do not remove trees, shrubs and understorey outside the feedlot area.
- Weeds and exotic vegetation must be removed and controlled – Alien vegetation eradication programme.

12.6.4 Sewage and ablution

- No ablution or washing outside designated areas.

12.6.5 Waste management

- No littering is allowed on the property or neighbouring properties. A litter patrol will be conducted once a week to remove litter from the environment and properly dispose of this.
- No waste is to be buried on this site or neighbouring properties.
- No burning of waste.
- Use skips/bins/bags for general waste storage until it is removed for disposal.
- Oils / greases / hydrocarbon contaminated waste is considered hazardous and should be collected separately for recycling.
- Waste manifests or safe disposal certificates need to be obtained for all waste streams leaving the site to ensure proper recycling or safe disposal.
- Clean up any spillages from vehicles or equipment and dispose appropriately of the waste which was generated as a result of spillages.

12.6.6 Water

- Use water sparingly. No wastage of water will be allowed. Close taps after use.
- Repair leaking pipes.
- Ensure all valves or taps on water lines are closed if not in use.
- Maintain infrastructure (pipes) that convey water to prevent blockages and/or spillages.

12.6.7 Sensitive environments

- Streams, rivers, wetlands and dams or any area associated with naturally occurring water is considered environmentally sensitive features and should be avoided.
- Remain within demarcated areas.

12.6.8 Safety

- Keep on designated pathways and roads.
- Report fires, incidents, accidents, injuries etc.

12.6.9 Recording & Reporting

- All complaints by members of the public or neighbours should be registered and captured in a complaints register to allow investigation and remedial action;
- All incidents should be recorded in an incident log sheet to allow investigation and remedial action (see Table 6);
- Report impacts/incidents/accidents immediately to a supervisor/manager;

- Investigate any impact/incident/accident to find out why it happened, what can be done to fix it and what should be done to prevent it from happening again; and
- Report any damage to infrastructure to supervisor/manager.

12.6.10 Recording and Reporting of Incidents / Accidents / Impacts

The second objective of the environmental awareness plan is to inform employees and contractors of the manner in which the identified possible risks must be dealt with in order to prevent degradation of the environment. Work/operational procedures and protocols will deal with this. Dealing with identified possible risks will also include recording and reporting of incidents / accidents / impacts.

Investigation Reports

All incidents / accidents / impacts (injuries, spillages etc.) will be recorded as per defined SHEQ standards. A standard format (investigation report) will be completed for each incident / accident / impact to allow further investigations into the matter.

The investigation report will contain the following information:

- Particulars and description of incident / accident / impact (date, time, area, conditions etc.)
- The investigator;
- Root cause;
- Corrective and preventative measures to prevent recurrence;
- Witness and Insured's statements;
- Photos and Work Instructions; and
- Risk assessments carried out for the tasks performed.

Emergency and Contingency Measures

Emergency and contingency plans will be put in place in conjunction with the necessary equipment (fire extinguishers) and personnel (first aider) on stand-by to manage such situations as and when necessary. Codes of Practice, operating procedures and planned maintenance systems will be established for inspection, maintenance, and to ensure effective and continuous operation and early detection of any malfunction or emergency incident.

Table 5: Emergency Contact Details

NETCARE	082 911
POLICE	10111
POLICE STATION (Koster – 44 Malan Street)	014 543 8600
FIRE/AMBULANCE	10177
FIRE STATION (Koster –corner Rissik & De Wet)	014 543 4337
HOSPITAL Koster Swartruggens	014 544 8500 014 544 0751

